Report to the Commission of Dr. Sidney Coupland, on the outbreak of small-pox in the city of Gloucester in 1895-96.

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VACCINATION COMMISSION.

APPENDIX VII.

TO THE

FINAL REPORT

OF THE

ROYAL COMMISSION ON VACCINATION.

REPORT TO THE COMMISSION

OF

DR. SIDNEY COUPLAND,

ON THE

OUTBREAK OF SMALL-POX

IN THE

CITY OF GLOUCESTER

IN

1895—96.

Presented to both Houses of Parliament by Command of Her Majesty.



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the former. Even were the type much milder in the earlier period, the difference would still be very striking.

Incidentally I may mention that the age-incidence (fatal cases only) differed in the two outbreaks. In 1873–75, the proportion of deaths below 1 year of age was 2·6 per cent. In 1895–96 it was 14·0 per cent. In 1873–75, at ages 1 to 10 years, the proportion of deaths was 31·1 per cent. In 1895–96 it was 50·4 per cent. In 1873–75, at ages 10 to 30 years, the proportion of deaths was 45·7 per cent. In 1895–96 it was 12·6 per cent. In 1873–75, at ages 30 and upwards, the proportion of deaths was 20·5 per cent. In 1895–96 it was 22·7 per cent.

Special features of present outbreak.

Indeed, the most remarkable feature about this outbreak, wherein it differs not only from the previous one in the same place, but from most other recent outbreaks of small-pox in other parts of the kingdom, has been the enormous rapidity with which it extended, and to this must be added the singular abruptness with which it ceased, and also the large number of children attacked. I was also impressed by the severe type of the disease, never having met, in the various inquiries on which I have been engaged during the past few years, with so large a proportion of malignant cases, or so high a mortality as characterised this epidemic.

The account given in this report of the rise and progress of this exceptional epidemic shows that for the first six months of its course it created but little anxiety. The cases which arose were traceably connected with one another; they were promptly removed to hospital on receipt of notification, and the system, now generally adopted, of "quarantining" the infected households was carried out with efficiency; but the sanitary staff and the hospital accommodation which sufficed for an outbreak of such limited dimensions could not be expected to cope with that which soon developed. Whilst from June to December there had been only 27 cases, in January there were as many as 52; but even this increase, although adding to anxiety, was not beyond the resources then at the disposal of the authorities. There had, too, been some fluctuations in the weekly returns, which gave hopes that the city might yet escape a severe visitation. However, in the middle of February, there was a striking exacerbation, the numbers notified rising in the week ending February 22 to 43, as against nine in the previous week, the total for the month being 145. This increase was due to the fact that within a few days of one another about 40 children attending the Widden Street Infants' School were attacked, and it will be seen from the particulars given in the report that there is good ground for believing that shortly afterwards other of the public elementary schools similarly served to disseminate the disease, until they were closed by the order of the sanitary authority. At any rate the large proportion of those attacked from the middle of February to the middle of March were young children. Strenuous efforts were made to cope with this unexpected influx of cases, the Stroud Road Hospital was extended (there had been already appointed to it a medical officer who had the sole charge of the patients, with the control nominally resting with the Medical Officer of Health) and at the beginning of March the "cholera" hospital at Hempstead, enlarged by the addition of a temporary block, was also thrown open for the reception of patients. This hospital was visited by another medical officer, and its nursing placed in the sole charge of ladies of the Clewer Sisterhood. Nevertheless the accommodation, now amounting to 200 beds, proved wholly inadequate; the hospitals became filled beyond their normal capacity, and the strain imposed upon the staff must have been very great. For the like reason, too, the administration of the hospital became disorganised, and defects inevitable to these conditions arose. The disease had now obtained a footing in the city which rendered it beyond control; the increasing numbers who remained in their homes served to keep up foci of contagion, which resulted in some quarters both in the south and west of the town being visited to a disproportionate extent, so that in some streets hardly a house escaped the disease. In March there were 604 fresh cases, in April 733, in May 283, and in June 122. It was somewhat remarkable to observe how suddenly the outbreak subsided, for in July (to the 18th) there were only 13 cases, and after that time, *i.e.*, after the period covered by this report, there were only three more cases, the last notification being on July 25.

Amongst the leading agencies which operated to cause this widespread epidemic, whereby it may be computed about 1 in 20 of the population have suffered, must be reckoned in the first place the invasion of the schools referred to. It is impossible to ignore the fact that these children must have been peculiarly susceptible to the contagion of small-pox, and no one at all conversant with the data of small-pox

outbreaks can doubt that if these children had been vaccinated, so many (if, indeed, any) of them would have been attacked by the disease.*

Agencies which promoted the spread of the disease.

It is equally certain that the mortality which ranged so high amongst these children, and which went far to prejudice the people with regard to hospital treatment, would have been almost wholly limited to adults. For my own part, and viewing the subject with as impartial a mind as I can, the conviction is forced upon me that Gloucester would not have suffered as it did had its child population been vaccinated. To my mind it seems a wilful shutting the eyes to this patent fact to assume, as has been done, that insanitary conditions were responsible for the outbreak in general, and for this school invasion in particular. Again, I must record my testimony to the manner in which the medical officer and nursing staff discharged their duties in respect to the care of the patients under their charge. Certainly I myself saw nothing at any of my visits which could be ascribed to negligence in treatment. That their task was no light one, far heavier indeed than ought to have been imposed upon them, is manifest from the fact that during the month of March the hospital was crowded with severe acute cases of young children requiring constant and careful attention. I mention this in justice to them, although it was no part of my mission to inquire into measures of treatment. It was most unfortunate that the decision to improve the administration of the hospital was not taken earlier; not that it would have been possible to have averted the mortality of the children, but that the work in the hospital might then have been better organised, and laxities unavoidable from a limited staff and ever rising influx of patients avoided. It is possible that the hope was entertained that by an attempt to isolate every case as it arose the epidemic might be checked, but this attempt only resulted in filling the hospital beyond its capacity and overburdening a too restricted staff. The hospital which, as regards its construction (at any rate the original block), was not inferior to many small-pox hospitals that I have seen, and superior to some, thus suffered greatly in credit, and this taken together with the enforced retention in their homes of the majority of the cases arising in March and April, led to the disinclination to enter it. Hence, when by the end of April the accommodation had been so extended as to have sufficed for the admission of every case, and when too the staff had been re-organised, and the whole arrangements improved, there were comparatively few cases out of those notified which were thus isolated. A further inducement to remain in their homes was given by the introduction into the city of a system of hydropathic treatment to which allusion is made in the body of this report. Thus, then, it is clear that the leading principle of dealing with an infectious disease, namely, the effective isolation of the attacked, was for the chief part of the outbreak in abeyance, and as also the quarantining of invaded households could no longer be controlled, but only advised, the facilities for the spread of the disease became unlimited. But whilst there can be little wonder that the epidemic attained such great proportions, it is certainly remarkable that it ceased so abruptly. The share taken in this by the universal adoption of re-vaccination is difficult to estimate, as it was impossible for me to obtain reliable data of successful re-vaccination. It would have been interesting to have ascertained whether the small-pox attack-rate in families was in any way relative to the numbers re-vaccinated, but this I have been unable to determine, owing to the fallacies involved in any such computation.

Comparison with Dewsbury (1891–92) and Leicester (1893–94) outbreaks.

I propose now to endeavour to make some comparison between the three outbreaks of small-pox which I have had to investigate for the Commission, namely, that in the Dewsbury Union in 1891–92, that in Leicester in 1893–94, and the present Gloucester epidemic. It must not, however, be considered that these places are comparable in other respects, either in population, industries, sanitary government, or general sanitation. One thing they had in common, and that was the relatively high proportion of children who had not been vaccinated, a proportion which was highest in Gloucester, nearly as considerable in Leicester, and markedly less in the Dewsbury Union.

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* This may seem a gratuitous assumption, but to myself it is amply justified by facts coming under my personal cognisance. Thus, to take some of the figures in recent outbreaks (up to the date of completion of my inquiries upon them), I find that of 3,546 attacks of small-pox, only 85, or 2·4 per cent., were in vaccinated children below the age of 10 years. In the Dewsbury Union (1891-92) the total attacks were 1,029, 44 vaccinated children under 10 years; in Manchester (1892–93) the figures are 865 and 11 respectively; in Oldham (1892–93), 107 and 3; in Leeds (1892-93), 200 and 4; in Halifax (1891–92), 330 and 4; in Bradford (1893), 658 and 17; in Leicester (1893–94), 357 and 2. Amongst these 85 cases, there was but one death, viz., at Dewsbury.

Weekly Incidence and Fatality.—In the Dewsbury Union (population, 163,000) in 1891–92, during a period of 70 weeks, there were 1,029 small-pox attacks, a weekly incidence of 14. In the borough of Leicester (population, 180,000) in 1893–94, during a period of 70 weeks there were 357 attacks, a weekly incidence of five attacks. In the city of Gloucester (population, 40,000) in 1895–96, during a period of 58 weeks, there were 1,979 attacks, a weekly incidence of 34 attacks. Again at Dewsbury there were 110 deaths (mortality, 10·7 per cent.), a weekly average of 1·5; at Leicester there were 21 deaths (mortality, 5·8 per cent.), a weekly average of 0·3; at Gloucester there were 434 deaths (mortality of 21·9 per cent.) a weekly average of 7·5.

In Dewsbury the deaths were to the attacks as 1 to 9, in Leicester as 1 to 17, in Gloucester as 1 to 4½.

These figures show that the outbreak in Gloucester was proportionately more extensive, and more fatal, than at the other places.

Age Incidence and Fatality.—At Dewsbury 224 of the attacked were under 10 years of age, in Leicester 109, in Gloucester 706, the number of deaths being respectively 57, 15, and 280. Therefore at Dewsbury the proportion of the whole number attacked who were under 10 years was 21·7 per cent., in Leicester 30·5, in Gloucester 35·6 per cent. And the fatality of this class was in Dewsbury 25·4 per cent.; in Leicester, 13·7 per cent.; in Gloucester, 39·6 per cent.

Above the age of 10 years there were at Dewsbury 805 attacks, 53 deaths; at Leicester, 248 attacks, 6 deaths; at Gloucester, 1,273 attacks, 154 deaths. The proportion to the whole number at this age was, therefore, at Dewsbury, 78·3 per cent., at Leicester, 69·5 per cent., at Gloucester, 64·4 per cent. Whilst the fatality at this age was, at Dewsbury, 6·5 per cent., at Leicester, 2·4 per cent., at Gloucester, 12·1 per cent.

A comparison of the age-incidence of the fatal cases of small-pox at Gloucester in the years 1872–75 with that of those in the epidemic of 1895–96 shows how in the former period the proportion of deaths below the age of 10 years was far below that amongst those above that age, whereas in the latter period these proportions were reversed, thus:—

In 1872–75, under 10 years,	53 deaths, or	33	per cent.
„ 1895–96	„	280	„	64·5	„
In 1872–75, over 10 years,	107	„	67	„
„ 1895–96	„	154	„	35·5	„

A closer analysis shows further that this divergence obtains mainly in the two age-periods of "1 to 10" and "10 to 30," for in 1872–75 the proportions of fatal cases were, under 1, 12; 1 to 10, 21; 10 to 30, 46; over 30, 21; and in 1895–96 these proportions were, under 1, 14; 1 to 10, 50; 10 to 30, 13; over 30, 23. It seems, then, highly probable that in the earlier outbreak the incidence of the disease upon children over the age of one year was far lower than in the present epidemic, where, indeed, this excessive child-incidence has been one of the most striking features.

Type of the Disease.—I have already mentioned incidentally the impression I gained almost from the outset of my inquiry as to the severity of the cases in this outbreak. This impression is verified by a statistical comparison of the types of the attacks here with those in the Dewsbury and Leicester outbreaks. Thus grouping together the "malignant" and "confluent" cases on the one hand, and the "coherent, discrete, and mild" on the other, it appears that in Dewsbury 26·5 per cent. of all attacks, or 273 cases, were of the former more severe types; in Leicester, 26·8 per cent., or 96 cases; in Gloucester, 43·1 per cent., or 854 cases (inclusive of three fatal "indeterminate" attacks in very young infants). Conversely, dealing with the lightest form of all, those cases termed in these reports as of "mild" type, it appears that in Dewsbury the percentage of the whole number attacked who fall into this category was 27·5, in Leicester, 35·5, and in Gloucester, 25·5.

Invaded Houses and Attack-rates.—The number of cases of small-pox per house was larger in Gloucester than in either Dewsbury or Leicester. Thus in Dewsbury there were 645 houses invaded, 1,021 persons in them suffered from small-pox, or 1·6 per

house; in Leicester 193 houses, 320 persons attacked, or 1·6 per house; in Gloucester 1,098 houses invaded, 1,979 persons attacked, or 1·8 persons per house. Or, stated in another way, in Dewsbury 34 per cent. of all invaded houses had more than one case of small-pox in them, in Leicester 34·2 per cent., and in Gloucester 39·4 per cent. I shall return to these figures when speaking of hospital isolation.

Information was obtained at 544 invaded households in Dewsbury, 193 in Leicester, and 899 in Gloucester. The numbers of their inmates amount in all to 8,895 persons exposed to the chances of small-pox infection, of whom 2,924 were attacked, giving an attack-rate of 32·8 per cent. At Dewsbury among 3,000 exposed, 887 were attacked, or 29·5 per cent.; at Leicester, out of 1,234 exposed, 320 were attacked, or 25·9 per cent.; at Gloucester out of 4,861 exposed, 1,717 were attacked, or 35·3 per cent.

At Ages under 10 *years.*—At Dewsbury, of 729 exposed, 203 were attacked, or 27·8 per cent.; at Leicester, of 361 exposed, 102 were attacked, or 28·2 per cent.; at Gloucester, of 1,603 exposed, 641 were attacked, or 40·6 per cent.

At Ages over 10 *years.*—At Dewsbury, of 2,271 exposed, 684 were attacked, or 30·1 per cent.; at Leicester, of 873 exposed, 218 were attacked, or 24·9 per cent.; at Gloucester, 3,258 were exposed, 1,076 were attacked, or 33 per cent.

Vaccination and Small-Pox.—In each of these inquiries the greatest care was taken to determine the condition as to vaccination of those who were attacked with small-pox. It was found possible to range them under five categories, namely:—1. The vaccinated, those who were known to have been vaccinated in infancy, and those who bore marks of this. A sub-class included those who had undergone re-vaccination at some time of their lives. 2. Those who were stated to have been vaccinated in infancy, but in whom the evidence of this was imperfect, or absolutely wanting. In this category are to be found cases of extreme confluent small-pox where the primary marks might have been obscured by the copiousness of the rash. They form the group styled in the reports "Alleged vaccination." 3. Those in whom it was not possible to obtain any information at all on the question of vaccination. 4. Those who were known not to have been vaccinated when exposed to infection, but who had undergone vaccination subsequently, generally on the appearance of small-pox in their family. This class, therefore, includes persons who were "under vaccination" during the period of incubation of the disease, or in the first days of the attack. 5. Those who had never been vaccinated when exposed to and attacked by small-pox.

In the several reports the numbers falling under each of these categories are distinguished, but for the purposes of this summary it may be preferable to collate them all into two main groups, viz., *vaccinated*, including the classes 1, 2, and 3 named above; and the *unvaccinated*, including classes 4 and 5. It should, however, be remarked that the mortality of class 4 was in each series much below that of class 5, so that the combination of the two does to a certain extent diminish the fatality of the strictly unvaccinated class.

The Vaccinated Class.—Of those attacked in Dewsbury, 662 fall into this category, or 64·3 per cent of the whole number; in Leicester, 199 or 55·8 per cent; in Gloucester 1,211 or 61·2. The fatality amongst these was in Dewsbury 2·7 per cent. (18 deaths), in Leicester 1·0 per cent. (2 deaths), in Gloucester 9·8 per cent. (120 deaths).

The Unvaccinated Class.—In Dewsbury 367 attacked, or 35·7 per cent. of the whole number; in Leicester 158 or 44·3 per cent.; at Gloucester 768 or 38·8 per cent. The fatality in each was, at Dewsbury (92 deaths) 25·0 per cent., at Leicester (19 deaths) 12 per cent., at Gloucester (314 deaths) 40·8 per cent.

These figures are beyond cavil, and prove, not only a general concordance in the relative mortality of the vaccinated and unvaccinated, but also that the rate in the latter may range from 12 to 40 per cent; attaining, that is, a much higher figure than has been often claimed for small-pox in the days prior to the introduction of vaccination. They show also that in the Dewsbury epidemic the vaccinated fatality was twice as great as at Leicester, and at Gloucester nearly 10 times as great. Further, that the unvaccinated fatality was 2½ times as great at Dewsbury as at Leicester, and more than 3 times as great at Gloucester.

The following table gives the analysis of the above statistics for the several age-periods adopted in these reports :—

Age.	Dewsbury.*			Leicester.			Gloucester.			Mean Fatality.
	Cases.	Deaths.	Fatality.	Cases.	Deaths.	Fatality.	Cases.	Deaths.	Fatality.	
Vaccinated.			Per cent.			Per cent.			Per cent.	Per cent.
1 month and under	—	—	—	—	—	—	—	—	—	—
1 month to 1 year	1	—	—	—	—	—	—	—	—	—
1 to 10 years	48	1	2·	2	—	—	26	1	3·8	2·6
10 to 30 years	391	6	1·5	114	—	—	636	34	5·3	3·5
30 years and over	216	11	5·	83	2	2·4	549	85	15·4	11·5
Unvaccinated.										
1 month and under	6	6	100·	—	—	—	22	21	95·4	96·3
1 month to 1 year	22	13	59·	6	2	33·3	63	40	63·5	60·4
1 to 10 years	147	37	25·1	101	13	12·8	595	218	36·6	31·7
10 to 30 years	169	27	16·	47	3	6·4	65	22	33·8	18·5
30 years and over	22	9	41·	4	1	25·	23	13	56·5	46·9

* In 7 (6 vaccinated and one unvaccinated) age not ascertained.

In the households of which particulars were obtained the proportion who were *unvaccinated* amongst those who were *attacked* was, at Dewsbury 33·1 per cent. (294 out of 887), at Leicester 43·3 per cent. (145 out of 320), at Gloucester 35·1 per cent. (604 out of 1,717); whilst the proportion of the unvaccinated amongst those who were *not attacked* was at Dewsbury 11·0 per cent. (233 out of 2,113), at Leicester 24·4 per cent. (223 out of 914), and at Gloucester 6·7 per cent. (212 out of 3,144).

The *attack-rate* of the unvaccinated was therefore at Dewsbury 55·7 per cent., at Leicester 39·4 per cent., at Gloucester 74 per cent.

In age-periods these proportions and rates were as follow :—

Age.	Dewsbury.			Leicester.			Gloucester.		
	Exposed.	Attacked.	Rate.	Exposed.	Attacked.	Rate.	Exposed.	Attacked.	Rate.
Unvaccinated Class.			Per cent.			Per cent.			Per cent.
1 month and under	59	24	40·6	32	7	21·8	23	20	52·2
1 month to 1 year							130	60	
1 to 10 years	254	135	53·1	251	93	37·0	1,178	537	45·6
10 to 30 years	224	141	62·9	95	46	48·4	102	55	53·9
30 years and over	68	15	22·0	10	4	40·0	42	17	40·5
Vaccinated Class.									
1 month and under	16	1	6·2	—	—	—	—	—	—
1 month to 1 year							14	—	
1 to 10 years	400	43	10·7	77	2	2·6	258	24	9·3
10 to 30 years	1,125	341	30·3	438	104	23·7	1,649	539	32·6
30 years and over	833	187	22·4	321	64	20·0	1,465	465	31·7
Age not ascertained	21	—	—	9	—	—	—	—	—

Mean Attack-Rates.

Age.	Vaccinated.	Unvaccinated.	Both Classes.
	Per cent.	Per cent.	Per cent.
1 year and under	3·2	37·3	33·4
1 to 10 years	9·2	45·4	34·4
10 to 30 years	30·6	57·4	33·7
30 years and over	27·3	30·0	27·4
At all ages	25·9	46·7	31·4

The various factors which may contribute to influence the attack-rate and mortality of a specific contagious disease are so numerous and complex that such a comparison as has been here instituted is of comparatively small value. The difference in locality, in the circumstances of the respective epidemics, the greater or less facilities for the communication of the disease among school children, factory hands, or other large sections of the community, the amount of hospital accommodation, the sanitary organisation, and also, it must be added, the character of the epidemic itself, which obviously varies from time to time, and from place to place these are a few of the conditions, which, quite apart from the question of the extent of vaccination, must operate more or less powerfully in determining the degree to which the members of a community invaded by small-pox suffer from the disease.

Nevertheless, some of these factors are more tangible than others, and although it may not be possible to attach to them their relative importance in the matter, yet all will admit that they do have some share, and as they are conditions which lend themselves to comparison it may be instructive to consider them. It will have been observed that in almost all respects Leicester suffered much less than either Dewsbury or Gloucester; the disease in that town hardly ever assumed the true proportions of an epidemic, its mortality scarcely affected the death-rate for the year, and the attack-rates, at every period of life, and amongst the vaccinated and unvaccinated alike, were below the mean of the three places taken together. Now, in one particular, without a doubt, Leicester does enjoy an advantage over either Dewsbury or Gloucester, and that is in respect to its sanitary government. It certainly cannot pride itself upon its hospital accommodation, but fortunately for the town that proved to be adequate for the comparatively small number of cases requiring to be admitted week by week. The same is indeed true of the borough of Dewsbury, but in some of the other districts of the Dewsbury Union, and notably in the borough of Batley, the outbreak of small-pox in 1891–92 attained proportions which rendered the hospital provision quite inadequate. In Gloucester too, although the hospital accommodation sufficed, so long as the epidemic was at a low level, it became insufficient when in the middle of February the disease spread with unwonted rapidity, owing to two large elementary public schools becoming infected. It need hardly be said that if by chance a similar accident had befallen Leicester, it too would have had its hospital accommodation soon rendered insufficient. There is no city in the kingdom which possesses anything approaching the isolation provision which could suffice for a weekly incidence of small-pox proportionate to the numbers notified in Gloucester during the weeks of March and April.

The amount of accommodation for small-pox patients in the Leicester Hospital at the beginning of the outbreak was about 30 beds, but by utilizing the other wards of the fever hospital this could be increased four-fold; and during the period several beds in these latter wards came to be occupied. At Dewsbury, where the whole of the infectious diseases hospital was also given up to the reception of small-pox patients, there were about 60 beds. At Batley, which at the outset was unprovided with an isolation hospital, there was provided temporary accommodation for about 40 patients, and later for some 30 more, the buildings being of an obviously makeshift character. At Gloucester the accommodation was at first limited to 48 beds, increased to 166 beds by the end of March, then to 316, the later additions being never utilised.

But even where the endeavour is made to isolate every case, a certain number fail to be so removed, as they do not come to the notice of the authorities at first, and there are sometimes refusals to go into hospital. Thus, at Leicester as many as 30 cases of small-pox were not removed to hospital, at Dewsbury five cases, whilst at Batley, where the accommodation did not at first exist and was later insufficient, as many as 302 out of a total of 545 were not removed. Finally, at Gloucester 1,267 out of 1,979 were not removed. The following table gives the numbers admitted into hospital in each place in every month, and it may be compared with the parallel table of the numbers of cases which remained at their homes :—

SMALL-POX.—MONTHLY INCIDENCE.

Month.	Leicester, 1893–94.	Dewsbury, 1891–92.	Batley, 1891–92.	Gloucester, 1895–96.
1st	1	—	1	1
2nd	6	—	4	—
3rd	11	5	8	3
4th	14	10	3	1
5th	37	8	5	3
6th	54	5	2	7
7th	18	6	—	12
8th	21	7	5	52
9th	44	2	76	145
10th	54	23	176	604
11th	32	44	123	733
12th	18	37	83	283
13th	16	44	35	122
14th	7	31	16	13
15th	11	17	1	—
16th	10	19	5	—
17th	3	7	2	—
	357	265	545	1,979

Small-Pox Cases removed to Hospital.

Month.	Leicester.	Dewsbury.	Batley.	Gloucester.
1st	1	—	1	1
2nd	5	—	2	—
3rd	11	5	5	3
4th	14	8	1	1
5th	35	8	—	2
6th	49	5	—	7
7th	17	6	—	11
8th	15	7	—	48
9th	38	2	20	121
10th	52	22	41	208
11th	30	43	52	214
12th	17	37	72	48
13th	15	44	26	39
14th	7	30	15	9
15th	8	17	1	—
16th	9	19	5	—
17th	3	7	2	—
	326	260	243	712

Small-Pox Cases remaining at Home.

Month.	Leicester.	Dewsbury.	Batley.	Gloucester.
1st	—	—	—	—
2nd	1	—	2	—
3rd	—	—	3	—
4th	—	2	2	—
5th	2	—	5	1
6th	5	—	2	—
7th	1	—	—	1
8th	6	—	5	4
9th	6	—	56	24
10th	2	1	135	396
11th	2	1	71	519
12th	1	—	11	235
13th	1	—	9	83
14th	—	1	1	4
15th	3	—	—	—
16th	1	—	—	—
17th	—	—	—	—
	31	5	302	1,267

In a memorandum on the Gloucester outbreak which I prepared at the request of a member of the Commission, with the special object of contrasting the facts as to hospital isolation and sanitary government in Leicester and Gloucester, I pointed out that in certain respects, undoubtedly, the larger town was superior, as indeed might be expected, not only from its size but from the great attention which it has for many years paid to sanitation. Yet, in regard to the actual health of the two places, as judged by the prevalence of zymotics, the important elements of drainage and water supply, and also in that of provision for hospital isolation, there is not much to choose between them, having regard to their relative populations. It is, however, to my mind a very important matter, especially in times of epidemic, that the Medical Officer of Health should, as in Leicester, be in such a position as to be enabled to devote all his time to the sanitary service. It is at such times, especially, that the value of having an independent officer for this purpose can be best appreciated. It is neither fair nor just to expect that one whose time and attention are necessarily diverted by the calls of private practice can be able to do as much public work as will one not so engaged. With a Medical Officer of Health in responsible authority, and occupied solely with his official duties, it is not likely that the hospital would have become so overcrowded, and its management so chaotic; for he would have been free to take over its full charge, and would have seen that its organisation needed the improvement that was, in fact, subsequently effected. At Leicester, where the medical officer is independent of private practice, it is possible

for him to keep himself in personal touch with all small-pox cases, to trace out their individual history, and to have medical charge of them in the hospital, which is wholly under his direction. But it must be admitted that even in Leicester, with its comparatively limited number of cases, the greater part of the time of its able and energetic medical officer was taken up by attention to the cases of small-pox, so that it is clear that if Leicester had been visited with an epidemic of similar severity as was Gloucester, it too would have been overwhelmed by the magnitude of the work required to cope with the outbreak. The same applies to the sanitary service of the two places. This is admittedly superior in Leicester, and during the small-pox outbreak there it was possible for every infected house to be visited by an inspector once a day for the fortnight of "quarantine," a duty which also was performed in Gloucester until, with the great multiplication of these infected centres, it became quite impossible to carry it on. Would not the same inability have occurred at Leicester had its epidemic been of similar proportions? For if we take as approximate proportions the population of the two places to be as 4 to 1 (*i.e.*, Leicester, 180,000; Gloucester, 40,000), the numbers of the attacked in the 10th, 11th, and 12th months would have been at Leicester, 2,416, 2,932, and 1,132 respectively, instead of 54, 32, and 18; whilst further, if there had been at Leicester a similarly proportionate number removed to hospital as there were at Gloucester, these admissions would for the 10th and 11th months have had to rise to 832 and 856, figures very far beyond the accommodation available, which, too, would have needed a staff of nurses and medical attendants, as well as buildings that would have taxed the resources of Leicester to an even greater extent than happened at Gloucester.

I have thought it well to draw this parallel, because, in my opinion, it is easy to exaggerate the part played in the control of epidemics by even the best sanitary organisation. In every epidemic cases occur unknown to the authorities until they have widened the area of infection by communicating the disease to others, and when, as happened at Gloucester, this widening of the area was due to the simultaneous infection of school-children, no sanitary authority could control its spread. I believe I am right in saying that during the Leicester outbreak the one thing that gave rise to most anxiety on the part of the authorities was lest the disease should be imported into the public elementary schools. Had this happened, and it was accident rather than foresight that averted its happening, there is no reason at all for doubting that the larger, better organised, and better equipped community might not have suffered to a parallel extent. I believe that I pointed out this in the memorandum referred to, and I think it is a consideration which ought not to be lost sight of in any endeavour to contrast the experiences of Leicester in 1893–94 with those of Gloucester in 1895–96.

Conclusions derived from this inquiry.

To sum up the main conclusions which seem to flow from this investigation:—

1. The epidemic of small-pox, which during 1895 had been comparatively slight and mild, assumed serious proportions in the months of February to April 1896, not only in the numbers who were attacked, but in the high rate of fatality, and the undue proportion of cases of confluent and malignant type.

2. The main reason for the rapid extension of the disease was the almost simultaneous invasion of many homes through children who were infected whilst attending certain of the public elementary schools.

3. Another reason for the spread is to be found in the inadequacy of the provision for hospital isolation, and the enforced abandonment of systematic "quarantine" inspection, both conditions being due to the enormously rapid increase of the attacked, and of the houses invaded by small-pox.

4. The outbreak might probably have subsided earlier had it not been for the fact that reluctance to enter the hospital became so general. Amongst the reasons which conduced to these refusals to avail themselves of this isolation the most potent seems to have been the high rate of fatality amongst the hospital patients in the weeks that the building was most crowded. This disproportionate fatality is to be ascribed to the equally disproportionate severity of the type of cases admitted into the hospital during this period.

5. A further reason for the spread and continuance of the epidemic may be found in the position of the hospital (many houses having been built in its vicinity of late years), and the lack of control in its administration. On the other hand the conditions obtaining in the streets and dwellings most affected were of themselves such as to sufficiently account for the dissemination of the disease by direct contagion.

6. There is no sufficient evidence to support the contention that defective drainage or other insanitary condition was responsible for the development of the disease and for its disproportionate incidence in the South Hamlet. But the conditions which favour contagion were abundantly present, especially the retention of a large proportion of cases within their homes, and in may instances, also, the impossibility of isolating the attacked within the house.

7. A feature which, as well as the exceptional fatality and severity, characterised this outbreak was the excessively disproportionate incidence of the disease upon young children. Of the whole number attacked (1,979) there were 706 under 10 years, or 35·7 per cent. Of the fatal cases (434) there were, in this age-period, 280 or 64·5 per cent.

8. Of these 706 children, only 26 were "vaccinated" (including one vaccinated three weeks before attack, and one who presented no marks of an alleged primary vaccination in infancy), whilst of the remainder 80 were "undergoing" vaccination when attacked, the vaccination having been performed within 14 days of the onset.

9. This proportion of vaccinated and unvaccinated amongst the *attacked*, 26 to 680, or, for every 100, vaccinated 4 (nearly), unvaccinated 96, may be compared with the proportions of the same ages and classes amongst those *exposed* to infection. According to the data collected from 899 households there were, under 10 years of age, 1,603, of whom 272 were vaccinated 1,331 unvaccinated, or, for every 100, 17 vaccinated to 83 unvaccinated.

10. There is no escape from the conclusion that the heightened mortality and severity of the epidemic were greatly due to so large a proportion of *unvaccinated children* being attacked, for :—

(*a*.) The case-mortality under 10 years of age was 39·6 per cent., amongst the vaccinated 3·9 per cent., amongst the unvaccinated 41 per cent. Had the fatality remained in each class the same as obtained for the whole number at this age, there should have been 11 vaccinated deaths, and 269 unvaccinated. Or had the rate been that which actually obtained amongst the "vaccinated" there should have been only 26 unvaccinated deaths instead of 279, whilst *per contra*, had the unvaccinated rate been general, the vaccinated deaths should have been 11.

(*b*.) The disparity is quite as marked when the type of the attack is contrasted. For of 507 cases of *severe* attacks (malignant, confluent, indeterminate) there actually occurred only 3 amongst the vaccinated. Had the proportion obtaining in the whole number been here maintained (4 to 96) there should have been nearly 21 vaccinated attacks. Or if we take the *mild* attacks only, there were 48 at these ages, of which 17 were amongst the 26 vaccinated subjects. There ought to have been only 2 had the ratio between vaccinated and unvaccinated obtained here as it did for the whole number attacked.

Again, at the "vaccinated rate" (11·5 per cent.) the severe cases amongst the unvaccinated should not have exceeded 82, whilst at the "vaccinated rate" also (65·4 per cent.) the unvaccinated should have yielded 444 mild cases instead of 31.

Similarly, if the "unvaccinated rates" had obtained, there should have been 19 instead of 3 severe attacks amongst the 26 vaccinated subjects and only 1 mild case instead of 17.

Indeed in whatever way the question is regarded it is beyond dispute that small-pox in the vaccinated at this period of life is comparatively infrequent (in Gloucester the attack-rate was 8·8 as compared with 30·2 in the same class at ages 10 years and upwards), and that in those who are attacked the disease is mostly of the mildest form, whereas amongst the unvaccinated at this age the majority of attacks are severe.

11. From which considerations it follows that in the epidemic here under notice the severity of the disease, its high mortality, and its propagation were influenced and promoted by the unduly large proportion of unvaccinated children who were exposed to infection and who were infected.

12. As regards small-pox in the "re-vaccinated" it will be observed that in no fewer than 190 instances were individuals attacked who were said to have been vaccinated more than once. The evidence of re-vaccination, however, is seldom as definite as is that afforded by a successful primary vaccination, whilst many persons acknowledge that their re-vaccination "did not take." This negative result of the operation was admitted in 62, yet it was not possible to say of the remainder that they had all been successfully re-vaccinated. Again in 86 individuals the re-vaccina-

tion had been done within so short a period of the onset of small-pox as hardly to be regarded as of any influence. In point of fact there were only seven persons, all of whom had discrete or mild attacks (including one "inoculated,") whose re-vaccination had been effected within from three months to 14 days of the attacks. In the remaining 35 the re-vaccination in several dated back for many years.

13. Lastly, it is not unlikely that had Gloucester been better equipped for the emergency, had its sanitary organisation been more on a level with what should be the rule in cities of its importance, the epidemic might not have attained such proportions. Nevertheless it must in fairness be remembered that the hospital accommodation for infectious diseases at the time of this outbreak was not actually inferior to that recognised as normally adequate for a place of its size (one bed per 1,000 of population), although I am far from thinking that in this matter sufficient provision is generally made. A permanent building, with a resident medical and nursing staff, ought to exist in every sanitary area. In this case the exceptionally sudden outburst of the disease, which spread with the violence of measles among the young, rendered nugatory all the efforts of the authorities to cope with it, and these very efforts to attempt general isolation, when the means for such a measure became inadequate, led unfortunately to conditions that tended to neutralise the effect of the extended provision which eventually was made.

In conclusion, I desire to express my thanks for the assistance rendered me in this prolonged inquiry by the authorities and officers concerned, to Mr. A. Woodward, the chairman of the sanitary committee, Dr. Campbell, the medical officer of health, Mr. Read, the city surveyor, Mr. G. S. Blakeway, the town clerk, Mr. Mayer, the clerk to the board of guardians, Mr. Pitt and Dr. Brooke of the Small-Pox Hospital, Mr. Ohner, the sanitary officer, and to all who furnished me with information which has enabled me to compile the following report.

SIDNEY COUPLAND.

London, December 1896.

PART I.

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§ 1. General Description of Gloucester.

The City of Gloucester.

The present boundaries of the City of Gloucester were fixed in the year 1875, when a considerable extension took place, many small local authorities being merged into one. Within the last few years many new houses have been erected just beyond the urban limits, particularly to the south and east. This suburban area is under the county administration, but as it practically merges into the city, with which it is continuous, the time seems to be approaching when, for administrative purposes, it may become necessary still further to extend the city limits. The present inquiry into the outbreak of small-pox deals only with the cases notified to the urban authority, and takes no count of those arising in houses beyond its area; but it must be understood that several cases occurred in these outlying portions of the district, which were notified to the Rural Sanitary Authority. In all that follows reference is limited to the urban district only.

Registration districts.

The urban district is divided into four registration sub-districts, viz., Kingsholm, St. Nicholas, South Hamlet, and St. John Baptist. These divisions are of varying extent. By far the largest is the South Hamlet, which includes about one-half the total area, and extends to the north beyond a line drawn from east to west across the centre of the city. The respective acreage is—

I.—Kingsholm - - - -	265 acres.
II.—St. Nicholas - - - -	352 „
III.—South Hamlet - - - -	700 „
IV.—St. John Baptist - - - -	126 „

Kingsholm.

The *Kingsholm* sub-district occupies the north-east portion of the city, and is comparatively slightly built over; the Wotton County Lunatic Asylum, the Union Workhouse, the stations of the Great Western and Midland Railways and the Cattle Market are all within this area, which is bounded on the east by the London Road and on the south by the Twyver Brook.

St. Nicholas.

The *St. Nicholas* sub-district is an irregular area embracing the thinly peopled northern part of the city, containing large detached residences and gardens, and two large open spaces; it extends also to the north-west extremity of the city beyond the River Severn, and comprises, therefore, the cathedral and some of the most densely crowded courts and alleys that lie between Westgate Street and the river on the one side, and the cathedral precincts on the other.

South Hamlet.

The *South Hamlet* is bounded on the east by the main line of the Great Western Railway, and is traversed by the Midland Railway, which joins on to the former at the south-east angle of the district. As stated, this district occupies more than one-half of the city, contains a large open space—the Park—its main roads being Barton

Street running eastwards, the Bristol Road southwards, and the Stroud Road south-eastwards. The Gloucester and Berkeley Canal partly bounds it on the west, and partly crosses the westernmost angle of the district (Llanthony Priory).

St. John Baptist.

The *St. John Baptist* sub-district, smallest in area, but densest in population, contains the heart of the city. Irregular in area, it extends to the north, enclosing some of the older, crowded streets which lie between the London Road on the east and Kingsholm Road on the west, whilst it embraces many of the smaller and older streets which cluster around the Cross (the highest point of the city) and the four main roads—Northgate, Westgate, Southgate, and Eastgate—that diverge from this spot.

§ 2. Water Supply and Drainage.

For the past 20 years the questions of water supply and drainage have been constantly before the minds of the people of Gloucester. The reason of this is simple. In the year 1875 the boundaries of the city were extended considerably, and the added districts were notoriously deficient in proper drainage, whilst they took their water from surface-wells in the gravel beds which underlie the greater portion of that district, the water of these wells being proved by analysis to be contaminated with organic impurity, probably derived from the leakage of defective drains.

Water supply and drainage of the old city;

In the first Annual Report to the Urban Sanitary Authority (1875) the then medical officer of health (Mr. J. P. Wilton) draws a sharp contrast in these two respects between the old city and the added districts. The former, he states, is provided with an "elaborate system of drainage of a very superior character," the "water-supply" he characterises as "good," but capable of improvement in regard to the occasional intermittence, and to its filtration. Apparently but few wells were in use then in this old part of the city; on the other hand he says that one "could hardly imagine a worse state of things as to drainage and water supply" than that which existed in the newly added districts. He had made frequent examinations of the water used throughout the whole of the district east and south-east of the town, and had only found one sample that was fit for consumption; and he describes the water as being drawn from wells sunk in the gravel bed that underlay the whole district, from near the Cemetery on the east to Brunswick Square on the west, embracing the area of Falkener, Regent, and Howard Streets. Drainage was mostly into cesspools or by brick culverts, conducting the sewage into brooks, part of which were culverted, but when open were most offensive. The Twyver brook, the chief of the three watercourses (*see* Plate I.), which ran into the Severn from the east, received much of this drainage, and was described as a "constant nuisance"; the Sudbrook also was used as a partly open drain.

of the added area.

Sewerage extension.

The city authorities in taking over the duties of the small local boards, were thus at once confronted with a condition of things that was injurious to health, and demanded immediate attention. Works were at once commenced to extend the city main sewers, and gradually to connect the old drains with the new, and at the same time to do away with wells and connect houses with the corporation water mains. The progress of this work year by year can be traced in the medical officer's annual reports, and although it has even now not been entirely effected, yet it is clear that no effort has been spared to complete it. Three deficiencies have been constantly alluded to in these reports, namely, the inadequate ventilation of the sewers, their imperfect flushing, and the restricted water supply; and to a large extent these have been remedied by the erection of sewer ventilating shafts, the provision of flushing boxes to the w.c's of houses that did not previously possess them, the connexion of every house with the city sewer system, and of an increasing number with the city water supply, rendering an extension of this imperatively necessary. By the year 1885 (I gather from the reports) the connexions with the city sewers were completed, but no fewer than 2,528 houses out of a total of 7,696 were still unprovided with flushing tanks. By the year 1894 (the date of the last published report) it is stated that 8,597 out of a total of 8,893 houses had these flushing boxes, whilst the number of ventilating shafts, which was 336 in 1885, had increased to 1,080. It could not but happen that these alterations should have materially reduced the nuisance arising from the escape of sewer gas from man-holes; although this still happens occasionally it is very much less than formerly, and not worse than in many a town drained in a similar manner. Allusion is made to the escape of sewer gas creating a nuisance

in the reports of 1877, 1882, and 1883; it was attributed to the lack of proper flushing, and the accumulation of sewage in the old drains. The latter cause has practically ceased to exist, and the former has been considerably amended, although some houses are still without means of proper flushing. The erection of ventilating shafts has also materially tended to convert the street man-holes from outlets to inlets. In 1892 a house-to-house inspection was made with a view of remedying defects in lax drainage. Many such defects were discovered and set right. In that year there were still 387 houses using well water (there had been 1,141 in 1885), but by the close of 1894 this number was reduced to 141.

City water supply.

The sources of the city water supply, at the beginning of the present year, were reservoirs situated on Robins Wood Hill, which is an isolated offshot of the Cotswold range to the south-east of the city, just beyond the boundary, and at Witcombe, on the Cotswolds, 5 miles from the city. The former was the original supply; the works at Witcombe being commenced in 1855 and extended in 1868. About 180 houses (chiefly in Alma Place, off the Bristol Road), are supplied with water from a small reservoir (Lysons') situated at Hempsted to the south-west of the city. The inadequacy of the total supply was long ago pointed out in the medical officer's reports, which showed that in seasons of drought it would be practically exhausted. I understand that such contingencies have occasionally arisen, rendering a recourse to the use of the waters of the Severn necessary. This undesirable remedy will, however, not again be required. In 1894 powers were obtained to increase the sources of supply, and a site at Newent nine miles to N.W. was secured. The works were completed this year, and the new water supply opened on July 1st, just as the older reservoirs were becoming very empty owing to the prolonged dry season.

I am indebted to Mr. Read, the city surveyor, for the following particulars of the sewerage system in Gloucester. He also kindly furnished me with two maps showing the watercourses and main sewer outfalls, from which the annexed sketch plans have been prepared.

General plan of city.

The city, which lies on the left bank of the Severn, at a point where the river makes an acute bend to the east, is situated on low ground. The highest point in the city is the Cross, whence proceed, in each direction, Westgate Street, leading down to the river, Northgate Street, from which branches off Worcester Street, passing on to Kingsholm to the north-west, whilst the main street continues as the London Road on the north; Eastgate Street, continued into Barton Street, leading eastwards, and Southgate Street passing through Littleworth and continued to the south in the Bristol Road, the Stroud Road passing from the junction of these roads towards the east. The Gloucester and Berkeley Canal and Docks, starting from the centre of the city between Westgate Street, Southgate Street, and the river, run directly south, almost parallel to the Bristol Road. On the east the city is bounded by the main line of the Great Western Railway, and the area included between this and the Midland Railway, which runs through the city, crossing Barton and other streets by level crossings, comprises the Tredworth district. Beyond this eastern boundary lies the cemetery, at the foot of Robins Wood Hill. Most of the new additions to the city and suburbs are in this eastern and southern portion, and it is in these directions, especially the latter, that a further extension of the limits of the urban authority is to be desired. At the present time the population of the extra or sub-urban area is estimated at about 1,700. It is under the control of the rural district.

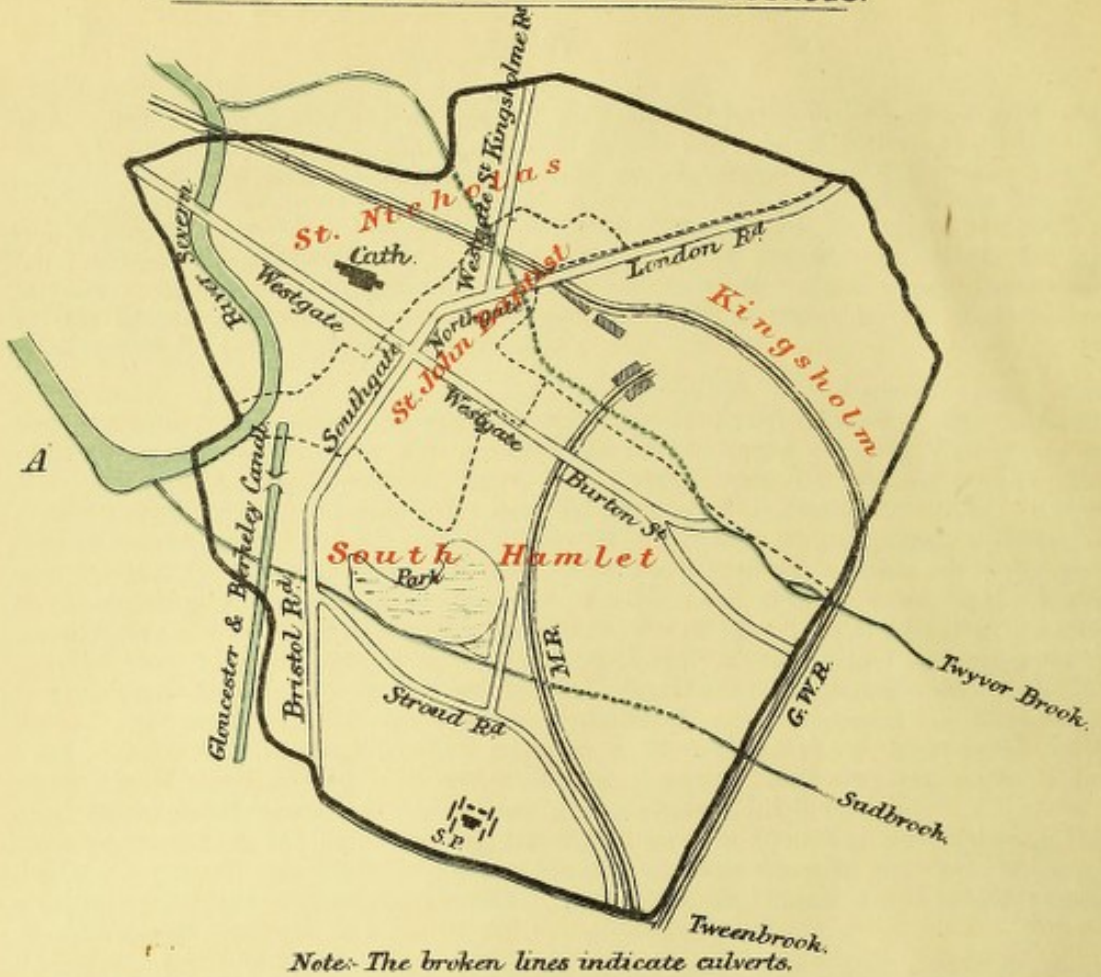
Three watercourses traverse the city from east to west (Plate I.), but only one of them is of any size. This is the Twyver Brook, the northernmost of the three, which arises in the Cotswolds, and enters the city north of Barton Street; open for certain distances, it is carried in culverts through part of the town, crossing the Market Place and Northgate Street, and emerging in fields beyond the northern boundary of the city to join the Severn. The central watercourse is the Sudbrook, also arising in the Cotswolds, and passing by Matson Place and Melbourne Street, where it is carried in culverts until the Midland Railway is crossed, when it is again open, bounding the Spa Fields on the south, then crossing Southgate Street, to terminate in the canal. An additional culvert utilised in flood time, is carried under the canal by a syphon (9-inch pipe) to open into a watercourse which ends in the river above the weir. The southern boundary of the city is formed by the small Tweenbrook, which takes its rise in Robins Wood Hill, and is carried by a pipe into the sewer in the Bristol Road; originally this brook passed along the Bristol Road to a culvert, and thence by the side of the canal for a distance of 420 yards, when it was conducted across the

The Twyver.

The Sudbrook.

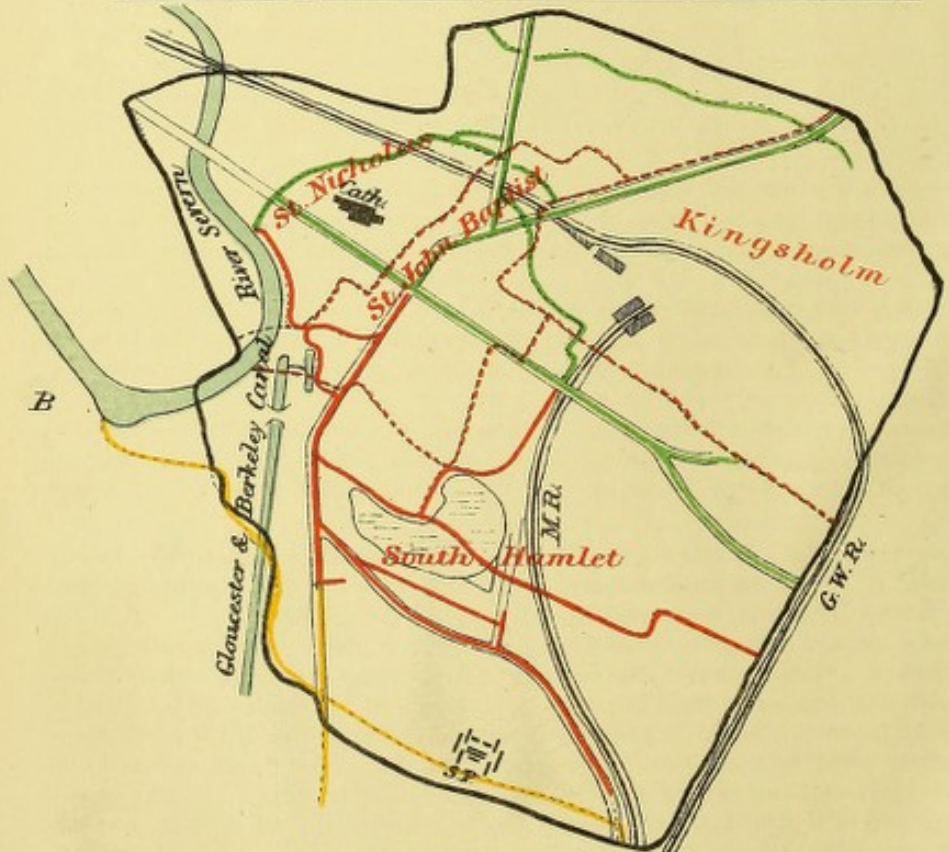
The Tweenbrook.

GLOUCESTER. PLAN SHOWING WATER-COURSES.



Note:- The broken lines indicate culverts.

GLOUCESTER. SKETCH PLAN OF MAIN SEWER OUTFALLS.



Northern Outfall Sewer coloured green.
Central " " " red.
Southern " " " yellow.

To face p. 17.

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canal by a syphon to meet the Sudbrook on its way to the river, but in 1884, when the south sewer outfall was laid down, the right limb of the Tweenbrook (it was originally bifurcate) was taken into the Severn, and the syphon utilised for it.

Sewage outfalls.

The older portion of the city was sewered in 1852, and on the extension of the boundary in 1875 the sewers were extended by Mr. James Massey, C.E., to cover the additional area. There are three main lines of sewerage, the northern, central, and southern; the two former run from the Cross, and discharge side by side in the river Severn, south of Westgate Street. The outlets are egg-shaped, 4 ft. 6 in. by 3 ft., and at each there is a fall of 1 in 480.

"The *northern* outfall sewer (coloured green in Plate I.) commences at the south-east boundary of the city against the Great Western Railway, and runs in a north-westerly direction along Lower Barton Street to the Midland Railway main line level crossing. From thence it turns along Station Road, Cambridge Street, Prince Street, along another portion of Station Road, across the Cattle Market to the 'Spread Eagle,' where it picks up the London Road and Northgate Street branches; through the 'Black Dog' yard to Worcester Street, where it picks up the Kingsholm Road branch; along St. Catherine's Street and Priory Road to Lower Westgate Street, discharging into the river at the City Quay. The *central* outfall sewer (coloured red in Plate I.), also lying against the Great Western Railway on the south-east boundary of the city, running in a westerly direction along Adelaide Street, Moor Street, High Street, Howard Street, Midland Road, across the Midland Railway main line to Park End Road; across the Park to Spa Road, along Spa Road to Southgate Street, when it picks up the Stroud Road branch and a portion of the Bristol Road sewer from Philip Street; then a short distance along Southgate Street to the dock gates opposite the Albion Hotel, skirting round the Victoria Dock into Commercial Road, down which it runs to the quay, and along the quay to where it turns into the river alongside the northern outfall. The *southern* outfall, or the south end drainage, constructed in 1884, commences at the southern boundary of the city in the Stroud Road, runs in a westerly direction down Linden Road to the Bristol Road, when it picks up the remainder of the Bristol Road sewer from Philip Street inside the city, and also a portion from outside the city; it then runs through Messrs. Barkworth and Spalding's and Messrs. Ashbee and Sons' timber yards to the canal bank, where it enters an old culvert—2 ft. 6 in. diameter—belonging to the Canal Company, and crosses under the canal by a syphon also belonging to the Canal Company; from thence it traverses open fields and osier beds for a distance of 650 yards, and discharges into the river at low-water mark below the Llanthony Weir.

"The northern outfall sewer is 3,433 yards in length, and has a fall of 57·60 feet in the distance, or an average gradient of 1 in 178. It commences with a 9-inch pipe by Chequer's Bridge, and discharges into the river by a brick culvert, 4 feet 6 inches by 3 feet.

"The central outfall sewer is 3,000 yards in length, and has a fall of 43 feet in that distance, or an average gradient of 1 in 209; commencing in Adelaide Street with a 9-inch pipe, and discharging into the river by a brick culvert, 4 feet 6 inches by 3 feet.

"The southern outfall sewer is 2,766 yards in length, and has a fall of 47·26 feet, or an average gradient of 1 in 175; commencing with a 9-inch pipe in the Stroud Road, discharging into the river below the weir by a brick culvert, 3 feet by 2 feet 3 inches."

It will be seen from Plate I. that the three lines of sewerage practically follow the valley lines of the three natural watercourses; the Twyver, the Sudbrook, and the Tweenbrook, which originally traversed the city.

The Tweenbrook, prior to 1884, as stated, ran through a culvert along the canal bank, and through a syphon under the canal, discharging above the weir; the brook was stagnant and foul (the Still Ditch it was termed), the inlet and outlet of the syphon being at the same level. The syphon was adapted to the south end sewer constructed in that year to remedy this state of things. The syphon was then thoroughly cleaned out and the outlet cut down 3 feet 6 inches below the inlet, and the present outfall sewer laid in a nearly direct line to below the weir, thus gaining a fall of 7 feet from the outlet of the syphon to low-water mark of the river. "Another great advantage from the adoption of this scheme was that it enabled "the Bristol Road sewer to be divided, and made it drain in both directions from

" Philip Street, whereas previously, in 1875, it was attempted to make it drain all in " one direction from Alma Place to the central sewer in Southgate Street."

" Previous to 1886, when the New Quay wall was built, the northern and central sewers had only one outlet, 4 feet 6 inches by 3 feet, this being again reduced below low water to an iron pipe 30 inches diameter, and the opportunity was taken when rebuilding the wall to give each of the sewers a separate outlet (4 feet 6 inches by 3 feet)."

Small-pox and drainage.

It has seemed necessary to enter into these details respecting the drainage of Gloucester because of the opinion, freely expressed, that the epidemic of small-pox could be ascribed to defective sanitation arising from drainage imperfections. This has been brought under the notice of the Commission by Lieut.-General Phelps, who also addressed letters to the public press in the same sense, his main contention being that the comparatively bad drainage of South Gloucester, as compared with that of North Gloucester, accounted for the incidence of the disease being mainly in the southern half of the city. These and other statements impugning the drainage, and the alleged effect of the high tide causing the sewers to be blocked, are replied to by the city surveyor in a letter dated 27th March 1896. I have, moreover, been convinced of the practical absence of any such reflux into the main sewers, and even as regards the syphon of the south end sewer it is hydrostatically impossible for such a reversal of the current to take place except under the most unusual combination of circumstances, viz., an exceptionally high tide, the flood season, and a wind against the stream. The highest flood in the last 18 years reached 14 feet above low-water mark, and the Waggon Works (between the canal and Bristol Road) were under water: but even then the syphon was 6 inches under water. From my own observation I cannot say that I observed any constant malodorous emanations in the streets of the South Hamlet, which in the course of my inquiries I must have traversed very many times; but I did on two or three occasions receive complaints from the inhabitants. The exceptionally dry season, and inadequate local flushing, may well explain such intermittent nuisance, but that there has been during the period of the epidemic any general or constant escape of sewer gas throughout the infected neighbourhood, such as would arise from blocking of the main sewers, is certainly not the fact. Among the infectious diseases, the dissemination of which may with fair certainty be accurately ascribed to sewer gas emanations, small-pox has not yet found a place. It would be presumption to affirm that its contagion could not be carried through drains, but far simpler explanations of its spread are ready to hand. Of diseases which may be termed " pythogenic," there has been a singular absence during the prevalence of small-pox, and, indeed, a very notable improvement in their amount within the city *pari passu* with the extension and improvement of the drainage. The idea that sewer gas has had to do with this outbreak* has in all probability arisen from the fact that for many years, owing to the old drainage defects, the extended South Hamlet gained unenviable notoriety, and I am sure that Mr. Read is correct in saying that " the " drains of the city will compare favourably with those of any other city or town " (*see* his letter of 27th March). He also informed me that " previous to 1875, the " districts which were then added to the city were in charge of three local boards " who had an elaborate system of shallow brick culverts, varying from 18 inches " to 2 feet 6 inches diameter, laid along the old ditches and draining into the Twyver " and the Sudbrook respectively. Most of them were laid in the back gardens of the " houses, and in laying the new sewerage system, in 1875, these had to be temporarily " connected wherever they were crossed. The consquence was that the street man- " holes and ventilators introduced on the new system became outlets for the stinks

* " Gloucester empties its raw sewage into the River Severn, on which it is built. This being a tidal river washes the sewage backwards and forwards past the city. The water supply is short in quantity, and is occasionally eked out by pumping water out of the sewage-polluted river into the mains. The land on which South Gloucester is built is flat, and the gradients of the sewers inadequate. Solidified sewage lies in them 18 inches and 2 feet deep, and the trickle of water over it is insufficient to flush them, but enough to keep up putrefactive fermentation. The escape of the sewage gas resulting from this horrible state of things is provided for by the man-holes, which are inserted at intervals in the streets. These loathsome fumes are being belched into the streets night and day. When the tides are high they rush under the ship canal, through the inverted syphons provided to carry off the sewage, and cause the contents of the sewers to be regurgitated through the gullies into the streets. The result is that the small-pox is confined to the areas drained by the central and southern sewers in which this condition of things exists. It seems conclusive that the disease is due to a sewer malaria, such as prevailed in the palaces of kings in the last century, when there were cesspits in every basement and sanitation was in the condition to be seen in South Gloucester to-day." Lieut.-Gen. Phelps, in " The Vegetarian," 13th June 1896, p. 283. This may be taken as an instance of grotesquely exaggerated ideas as to Gloucester drainage.

" generated in the old culverts, and the man-holes got a reputation which has never " left them, and it was not till 1885 that the last of these old culverts was done away " with, when a marked improvement in the death-rate immediately followed. Since " then," Mr. Read added, " nearly 600 ventilating shafts have been put up as " permission could be obtained, and the smells from the man-holes have been reduced " to be a minimum, only a small percentage of them creating a nuisance under " certain conditions of the atmosphere."

Lastly, it may be of interest to note that of 1,089 houses invaded by small-pox during this epidemic, 452 drain into the northern outfall, 469 into the central, and 168 into the southern outfall; no fewer than 350 of the houses in the South Hamlet draining into the northern sewer. As this last-named sewer has not been adversely criticised its connexion with almost as many infected houses as the central sewer seems to require explanation from those who believe in the sewer-gas theory.

§ 3.—Population, Birth and Death Rates.

For information upon the vital statistics of Gloucester I am indebted to the Annual Reports of the Medical Officer of Health to the Urban Sanitary Authority. These reports from 1875 to 1888 were prepared by Mr. John Wilton, those from 1889 onwards by Dr. John Campbell, the present Medical Officer of Health.

Population.

The population of Gloucester at the census of 1891 was 39,444, and the estimated population of the city at the end of 1895, based on the rate of increase in the previous decennium, would be 40,616.*

The estimate at the end of 1894 was 40,282, apportioned by Dr. Campbell amongst the four registration districts as follows:—

I.—Kingsholm	2,666	Density	10·06 per acre.
II.—St. Nicholas	7,522	„	21·43 „
III.—South Hamlet	21,992	„	31·41 „
IV.—St. John Baptist	8,102	„	64·3 „

Birth-rate.

The annual birth-rate during the past 20 years has varied from 43·8 in 1876 to 30·6 in 1887, the mean being 34·7 per 1,000 of population.

Death-rate.

The annual death-rate during the same period has varied from 23·2 in 1875 to 14·8 in 1887, and the mean being 18·8 per 1,000 of population.

The figures on which these computations are made differ from those of the estimated population given in the published reports. They are based on the assumption that the annual increase in population has been uniformly the same in each year in the intervals of the census. Thus, in 1871 the census returns gave a population of 31,804; in 1881, of 36,552, an increase of 4,748 during the decennium. In 1891 the population was 39,239, which would yield a much smaller increase than in the previous 10 years, viz., 2,687. Assuming further that the increase has been uniformly the same since 1891 as in the 10 years preceding, the estimated population at the end of 1895 would be 40,314. It is needless to point out that these figures are quite arbitrary, and that they can only be fairly approximate to the real numbers. Still they furnish perhaps a sounder basis for the calculation of the rates of births and deaths than the higher estimates arrived at by other methods.

It will be seen that there has been a decline both in the birth-rate and death-rate during this period, the means for each five years being:—

Period.	Mean Birth-rate.	Mean Death-rate.
1875–1879	38·4	21·5
1880–1884	34·1	19·2
1885–1889	32·1	16·5
1890–1894	31·5	18·2

* The house-to-house visitation made in April to May 1896, by direction of the Vaccination Committee of the Board of Guardians, accounted for a population of 39,857.

CITY OF GLOUCESTER.—POPULATION; BIRTHS AND DEATHS.

Year.	Estimated Population.	Births.		Deaths.	
		Total.	Per 1,000 of Population.	Total.	Per 1,000 of Population.
1875	33,703	1,262	37·4	783	23·2
1876	34,178	1,497	43·8	734	21·4
1877	34,652	1,251	36·1	738	21·3
1878	35,127	1,279	36·4	728	20·7
1879	35,602	1,364	38·3	746	20·9
1880	36,079	1,264	35·	754	20·9
1881	36,552	1,256	34·3	635	17·3
1882	36,820	1,279	34·7	810	22·
1883	37,080	1,262	34·	668	18·
1884	37,358	1,231	32·9	675	18·
1885	37,627	1,231	32·7	699	18·8
1886	37,895	1,304	34·4	605	15·9
1887	38,166	1,171	30·6	568	14·8
1888	38,433	1,197	31·1	637	16·5
1889	38,702	1,250	32·	650	16·7
1890	38,971	1,228	31·5	676	16·8
1891	39,239	1,284	32·7	807	20·5
1892	39,507	1,255	31·7	716	18·1
1893	39,777	1,254	31·5	807	20·2
1894	40,046	1,216	30·3	618	15·4
1895	40,569	1,301	32·	749	18·46

NOTE.—The above estimates of population between the census years are reckoned on the assumption that the annual increment was one-tenth of that in the whole preceding decennium, and that since 1891, a like rate of growth has continued as prevailed between 1881 and 1891. This reckoning makes the figures much less than those estimated at the time, and consequently gives higher rates than those published at the end of each year.

§ 4.—ZYMOTIC DISEASES.

During the 20 years, 1875–1894, for which alone statistics are available, Gloucester contrasts not unfavourably with many other towns in respect to zymotic disease. The Notification Act was only put into force in the city in the year 1891, so that for the greater part of this time there are only mortality returns available to indicate the extent of such diseases. However, each of the annual reports of the medical officer of health contains a "Table of Sickness," mainly compiled from returns of illness among (*a*) the inmates of the union, (*b*) those having out-door relief, (*c*) patients of the general and children's hospitals, and (*d*) of the hospital for infectious diseases. The figures derived from these sources do not, therefore, represent the actual amount of zymotic disease, but they indicate fairly the fluctuations year by year, and may be useful to compare with the death-returns of the same period.

GLOUCESTER.—CASES OF ZYMOTIC ILLNESS, 1875–1894. (1875 to 1891 limited to Paupers and Hospital Patients).

YEAR.	Small Pox.	Measles.	Scarlet Fever.	Enteric Fever.	Continued Fever of Doubtful Nature.	Diphtheria (and Croup).	Diarrhœa.
1875	29	58	35	11	18	—	103
1876	1	2	129	13	15	—	108
1877	1	17	28	33	23	2	96
1878	1	35	4	17	41	5	156
1879	—	1	1	7	21	3	104
1880	—	84	2	16	51	4	263
1881	8	17	30	19	24	6	155
1882	—	38	356	9	19	5	87
1883	3	6	103	26	48	2	135
1884	—	128	31	45	83	3	165
1885	2	38	19	16	34	9	95
1886	1	4	11	24	17	3	155
1887	—	18	54	24	2	1	162
1888	1	170	4	29	40	1	131
1889	—	6	22	75	36	4	147
1890	6	15	3	21	*	16	106
1891	—	*	11	1	*	27	*
1892	—	*	352	13	*	138	*
1893	3	*	286	33	*	62	*
1894	7	*	107	43	*	31	*
1895	26†	*	65	18	*	26	*

* No returns for these years, these diseases not being scheduled in the Notification Act which came into force November 1st, 1891.
† Notifications only.

From this return it would appear that *small-pox* occurred mostly in isolated cases in 12 of these years, the largest number being in 1875, which saw the close of a severe epidemic, of which, unfortunately, no records remain. That *measles* prevailed mostly in 1888, 1884, and 1880; *scarlet fever* in 1882, 1892, 1893, 1876, 1894, and 1883; *enteric fever* in 1889, 1884, 1894, 1877, and 1893; and *diphtheria* in 1892, 1893, and 1894, the mean annual number being exceeded in these years in the order indicated.

If these figures are to be taken as in any degree indicative of the *prevalence* of these diseases, their fatality must have varied considerably, for a study of the mortality returns during the same period shows that there is often a marked divergence in the results gathered from these two sources.

The mean annual zymotic mortality for the 20 years, 1875 to 1894, was 89·2, and this was exceeded in the years 1875, 1876, 1877, 1878, 1880, 1882, and 1888. The maximum excess was in 1882, and was largely due to the high mortality from scarlet fever in that year.

Regarding individual diseases, it will be seen from the following tables and Chart I. that eight deaths occurred from *small-pox* in the 20 years, seven of these being in 1875, and one in 1886. The mortality from scarlet fever exceeded the annual mean of 25·1 in each of five years, being highest in 1882, with 178 deaths, then 1876 with 141 deaths, 1877 with 58 deaths, 1883 with 57 deaths, and 1880 with 41 deaths. Since 1883 the mortality has been very small. The returns of *measles* contrast with those of scarlet fever in showing an excess over the mean annual mortality (13·9) in the seven years, 1877, 1880, 1884, 1888, 1890, 1891, and 1893, thus only coinciding with scarlatinal mortality in the first two of these years. *Enteric fever* shows a mortality below the mean (8·8) since 1889, the years of greatest excess being 1878 and 1880, in each of which there were 12 deaths. *Diphtheria* (and croup), on the other hand, has six years in which the deaths exceeded the mean for the whole period—in 1884, 1885, 1890, 1891, 1892, and 1893, the latter years especially being marked by undue prevalence of this disease.

The relative mortality from each of the diseases included in the zymotic class is given below, where for each year the proportion of deaths in each disease to that of the whole class is reckoned. During the 20 years, 1875-1894, the highest share in this mortality has been taken by scarlet fever, which accounts for 28 per cent. of the whole number of zymotic deaths; next diarrhœa, with nearly 24 per cent.; measles, with 15·5 per cent.; whooping cough, with 14 per cent.; diphtheria, 10 per cent.; enteric fever, 8 per cent.; and lastly, small-pox, with 0·5 per cent.

CITY OF GLOUCESTER, 1875 TO 1895.

Deaths from Zymotic Disease.

YEAR.	Deaths from all Causes.	Small-Pox.	Measles.	Scarlet Fever.	Enteric Fever.	Diphtheria (and Croup).	Diarrhœa.	Whooping Cough.	Total Zymotic Deaths.	Proportion of Deaths from Zymotic Disease per 100 Deaths from all Causes.
1875	783	7	8	26	9	1	43	7	104	12·9
1876	734	—	—	141	11	2	29	9	192	26·2
1877	738	—	28	58	9	3	12	26	136	18·4
1878	728	—	12	9	12	1	49	23	106	14·5
1879	746	—	—	1	6	6	12	27	52	7·0
1880	754	—	41	1	12	9	49	10	122	16·1
1881	635	—	1	22	6	3	10	15	57	9·0
1882	810	—	11	178	6	4	23	3	225	27·7
1883	668	—	5	36	9	3	26	7	86	12·8
1884	675	—	22	5	8	10	22	13	80	11·8
1885	699	—	6	3	2	16	11	23	61	8·8
1886	605	1	—	1	8	4	24	8	46	7·6
1887	568	—	5	7	7	5	12	2	38	6·6
1888	637	—	57	1	8	5	10	10	91	14·2
1889	650	—	2	—	8	3	14	26	53	8·1
1890	676	—	23	—	4	14	19	2	62	9·1
1891	807	—	16	—	5	26	11	18	76	9·4
1892	716	—	3	9	3	39	11	3	68	9·4
1893	807	—	36	3	2	14	22	6	83	10·2
1894	618	—	3	2	7	9	16	12	49	7·9
1895	749	5	—	2	5	6	33	11	62	8·4

City of Gloucester, 1875 to 1895.

Proportion of Deaths from Zymotic Diseases per 100 *Zymotic Deaths.*

(Plate II.)

Year.	Small-Pox.	Measles.	Scarlet Fever.	Enteric Fever.	Diphtheria (and Croup).	Diarrhœa.	Whooping Cough.
1875	6·9	7·9	25·7	8·9	0·9	42·5	6·9
1876	—	—	73·4	5·7	1·	15·1	4·7
1877	—	20·6	42·6	6·6	2·2	8·9	19·1
1878	—	11·3	8·5	11·3	0·9	46·2	21·7
1879	—	—	1·9	11·5	11·5	23·0	51·9
1880	—	33·6	0·8	9·8	7·4	40·1	8·2
1881	—	1·7	38·6	10·5	5·2	17·5	26·3
1882	—	4·9	79·1	2·6	1·7	10·2	1·3
1883	—	5·8	41·8	10·4	3·4	30·2	8·1
1884	—	27·5	6·2	10·	12·5	27·5	16·2
1885	—	9·8	4·9	3·3	26·2	18·	37·7
1886	2·1	—	2·1	17·4	8·7	52·1	17·4
1887	—	13·1	18·4	18·4	13·1	31·6	5·2
1888	—	62·6	1·1	8·8	5·5	10·9	10·9
1889	—	3·7	—	15·1	5·6	26·4	49·0
1890	—	37·1	—	6·4	22·5	30·6	3·2
1891	—	21·	—	6·6	34·2	14·4	23·6
1892	—	4·4	13·2	4·4	57·3	16·1	4·4
1893	—	43·3	3·6	2·4	16·8	26·5	7·2
1894	—	6·1	4·1	14·3	18·3	32·6	24·5
1895	—	—	—	—	—	—	—

In 1882 one death is ascribed to "vaccinia," and in 1884 one to "vaccination." In 1883 there is recorded a death from "chicken-pox."

Small-pox.—In 1874 there was a severe outbreak of small-pox, causing, according to the returns of the Registrar-General, 97 deaths. Unfortunately, there is no record of this epidemic.* I am informed that there were many malignant cases, and that the majority had to be treated in their homes, as there was not at first any hospital accommodation. In 1875 there were 29 cases with seven deaths.

1876.—A man came from Cardiff with an eruption on the face, for which, on his arrival, he consulted a medical man. The nature of his affection being recognised, he was forthwith sent to hospital, and, therefore, did not enter any house in Gloucester. No other case arose.

1877 and 1878.—In each of these years a single case of small-pox came to the knowledge of the authorities, and was removed to hospital.

1881.—Eight cases (six under five years of age) are returned in the "Table of Sickness" under the column of hospital "Out-patients." There were no deaths.

1883.—Three cases removed from a ship in Sharpness Docks to hospital.

1885.—One case sent to hospital by the medical officer to the union.

1886.—A tramp was admitted to hospital.†

1888.—One case admitted to hospital.

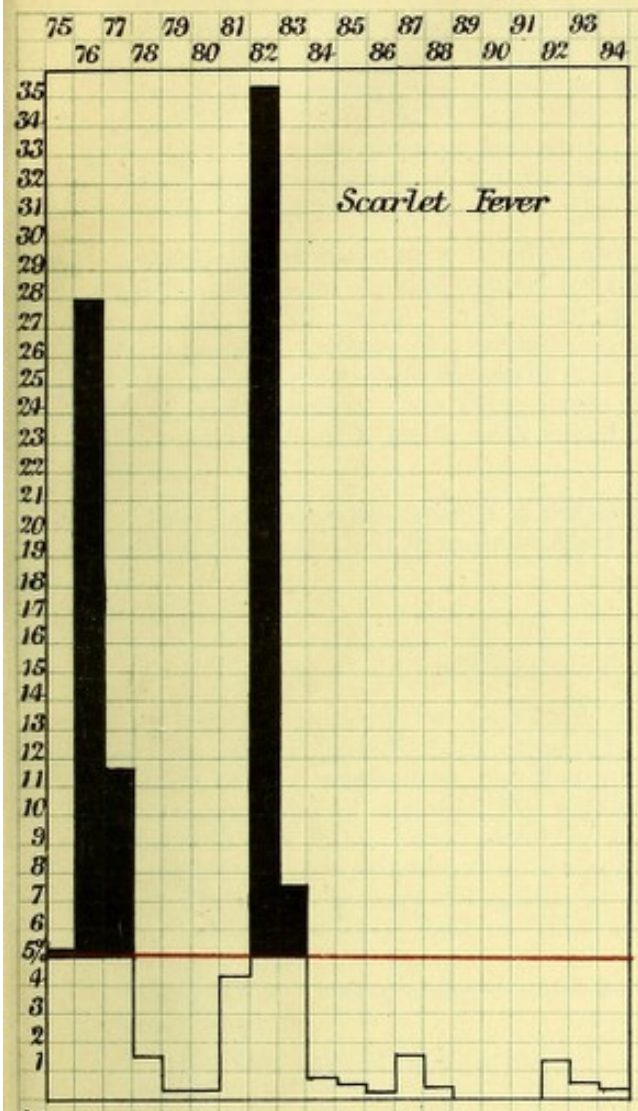
1890.—Six cases known to the authorities. Information was received by the medical officer of two cases in one house, which he had at once isolated and supervised. Another case occurred in the adjoining house. About the same time a sailor in a ship in the docks developed small-pox and was removed to hospital. Subsequently, two other cases in a house in another quarter of the city, were removed to hospital. Dr. Campbell made the following comments after mentioning the first cases:—"A week or two afterwards two cases occurred in another street of the city, and the "same prompt measures were adopted with like result. I feel sure that a threatened

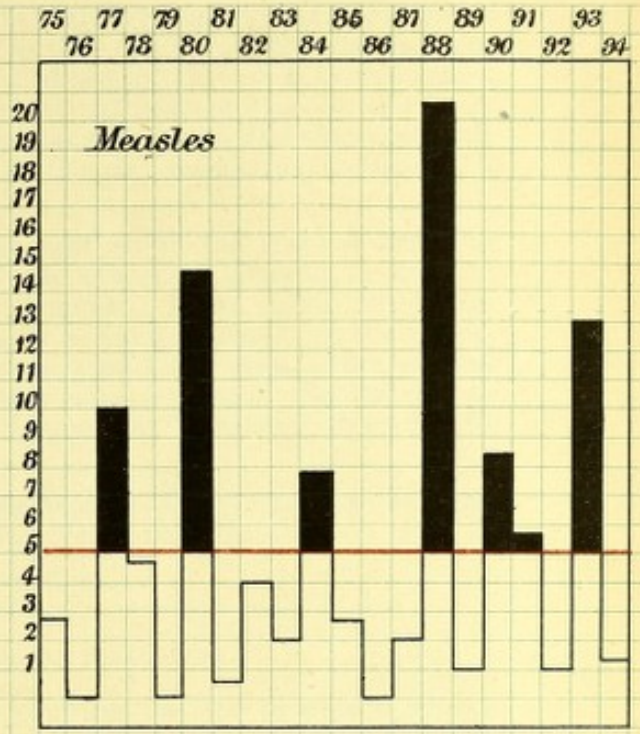
* *See* Addendum on page 32.

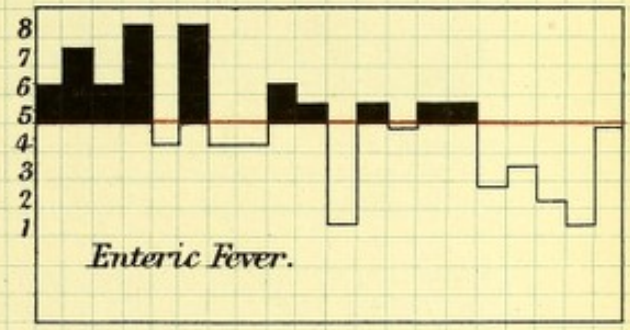
† There may have been another case in this year, as one death is reported, and the above case is mentioned as having been discharged from hospital cured.

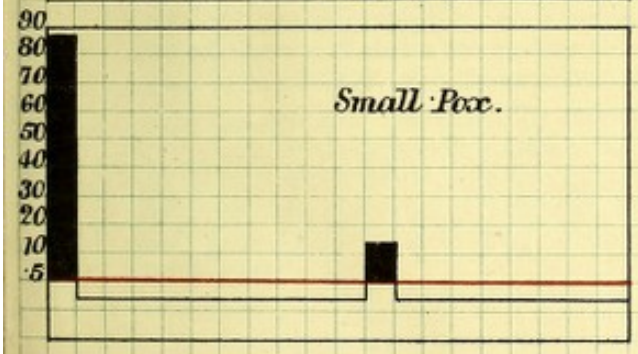
Plate II.

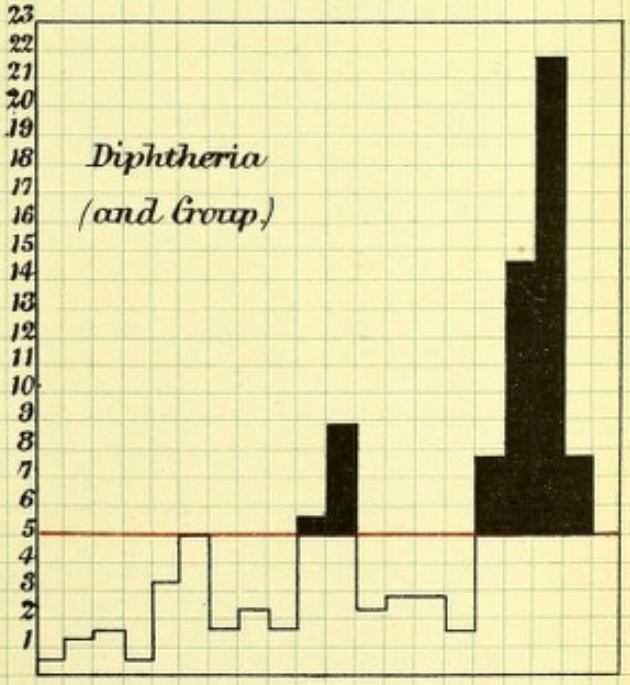
GLOUCESTER; COMPARATIVE ANNUAL MORTALITY FROM ZYMOTIC DISEASES. 1875–1894.

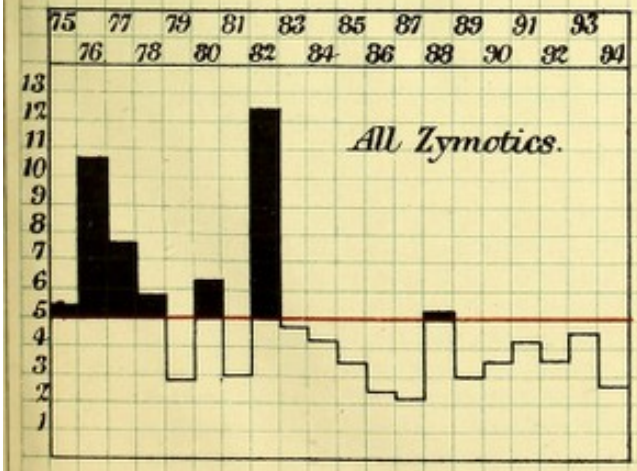












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To face p. 22.

" epidemic was thus averted, for I have no doubt that had I not been made aware of " the existence of the *first two* cases, happening as they did in a small house occupied " by a large family, and subsequently of the advent of the other cases in time, " probably the city would have had a very serious outbreak of this disease, which " might at the present time assume serious proportions from the fact that nearly all, " or a large proportion of, the young children of the city remain unvaccinated."—Annual Report for 1890, p. 5.

1893.—Three cases were notified, one a woman sent on to the hospital from the workhouse, where she had applied for relief, and the others, at intervals, in different quarters of the city. They were promptly removed. There were no deaths. Dr. Campbell writes:—We are still on the alert, as a severe epidemic of the disease " has been raging at Birmingham on one side of us, a good few cases at Stroud, near " us, and I believe that there are a great many cases at Bristol. So that we are " in the centre of a circle with many cases all around us."—Annual Report, 1893, p. 14.

1894.—Seven cases notified at different periods, none of them traceably connected with each other. All were promptly removed and their homes disinfected.

§ 5.—Procedure in Cases of Small-pox.

I was informed by Dr. Campbell that the following was the procedure adopted at the earlier period of the epidemic with regard to all cases of small-pox. On receipt of the notification, the Medical Officer of Health visited the house, confirmed the diagnosis, and directed the sanitary inspector to remove the case to hospital. Removal was in all cases promptly done. The bedding, carpets, &c. in the rooms occupied by the patients were destroyed by the sanitary authority, and compensation granted by the sanitary committee of the town council. The remaining inmates of the house were then kept at home under " quarantine " surveillance for a period of 14 days after the removal of the case. Or, if the case were not removed, the " quarantine " was prolonged until 14 days after the patient had been declared free from infection.

After the close of the quarantine period the house was disinfected by the sanitary authority. The room which had been occupied by the patient was sprayed with mercuric chloride solution, and fumigated with sulphur for a period of six hours. The windows and doors were then thrown open, and the floors cleaned with carbolic soap. The ceilings were limewashed, and the walls mostly re-papered.

As the epidemic increased in extent, some of these steps could not be carried out from lack of the necessary staff; the medical officer no longer visited the houses, unless in cases of doubt, and the quarantine was carried on without daily surveillance. From my own observation, however, I believe that most of the people loyally adopted the " quarantine " system, and remained in their houses until set free by order of the sanitary authority.

§ 6.—The Hospital for Infectious Diseases.

The Stroud Road Hospital was first established about 1875, the corporation borrowing 700*l.* for that purpose under a sanction of the Local Government Board, dated 28th February 1876, and erecting the hospital on a large area of land belonging to the corporation. The hospital, as originally established, was constructed mainly of wood, and comprised a small administrative building and a separate block (No. 1) comprising two wards of eight beds each. This block was enclosed with brick work, divided into four wards, and otherwise much improved in 1884.

The first use to which the building was put was to accommodate cases of small-pox, of which there was then a severe epidemic in the city. In 1878 there were 11 cases admitted, one of which proved fatal. The medical officer, in recording this, urges the need for improved appliances for the disinfection of clothing, &c. In the following year three patients were admitted, one of small-pox, two of scarlet fever, a disease for which the building was mainly intended. Yet its object as an isolation hospital for that disease must have had little, if any, effect on its spread, since but a

minimal proportion of those attacked by it in any year were removed, as these figures show :—

Year.	Small-pox.		Scarlet Fever.	
	Cases known.	Admissions.	Cases known.	Admissions.
1875 - -	29	11	35	—
1876 - -	1	1	129	2
1877 - -	1	1	28	4
1878 - -	1	1	4	—
1879 - -	—	—	1	—
1880 - -	—	—	2	1
1881 - -	8	—	30	1
1882 - -	—	—	356	12
1883 - -	3	3	103	13

Mr. Wilton, then medical officer of health, alluding to the small advantage taken of the hospital, attributes it to the fact that a slight charge was made for admission; but he also (in his report for 1882) mentions the fact that the building was ill-adapted for its purpose, and defective in construction. He cites and supports the recommendation which had been made by Dr. Thorne Thorne, who inspected the building on behalf of the Local Government Board, that the urban and rural sanitary authorities should combine to institute a Joint Infectious Diseases Hospital, sufficiently commodious for the needs of the districts. Some of the structural defects were remedied in the alterations in 1884, but Mr. Wilton still points out that the formation of the hospital was such that it would not be possible to have two different classes of infectious disease in the wards at the same time without risk of transference of contagion; he also mentions defects in ventilation.

Year.	Small-pox.		Scarlet Fever.	
	Cases known.	Admissions.	Cases known.	Admissions.
1884 - -	—	—	31	—
1885 - -	2	2	19	3
1886 - -	1	1	11	1
1887 - -	—	—	54	7
1888 - -	1	1	4	3
1889 - -	—	—	22	14
1890 - -	6	6	3	?
1891 - -	—	—	11	?
1892 - -	—	—	352	157
1893 - -	3	3	286	119
1894 - -	7	7	107	85

In 1892 the hospital was enlarged by the erection of Blocks 2 and 3 by Messrs. Humphreys and Co., and from this year the proportion of admission to attacks has risen considerably. The new blocks each contained two wards of eight beds each, separated by a kitchen, room for nurses, pantries, &c., and having a bath-room and w.c. at one end. A laundry and mortuary were also erected in 1892 by Messrs. Humphreys and Co.

It may be convenient here to summarise the further steps taken to extend the hospital accommodation during the present epidemic.

Blocks 1, 2, and 3 were available on the outbreak of small-pox.

Owing to the sudden increase in the number of cases the Sanitary Committee, on the 24th January 1896, authorised the Medical Officer of Health to make use of the hospital of the Port Sanitary Authority at Hempsted (16 beds) which had not previously been used.

On the 29th January 1896 the Sanitary Committee accepted an estimate for erecting at Hempsted an additional block, comprising two wards of 10 beds each, with kitchen, bathrooms, &c., complete.

On the 5th February 1896 the Committee accepted an estimate for another block to be erected near the Stroud Road, and several other blocks were afterwards erected there.

The accompanying maps show the situation and general arrangement of the Stroud Road Hospital, and the following table shows the dates at which the various blocks were opened or available for use :—

Stroud Road	Block 1.	(16 beds.)	Available before outbreak of small-pox
	„ 2.	(16 „)	
	„ 3.	(16 „)	
Hempsted	„ A.	(16 „)	Opened 28th January. Closed 27th May.
	„ B.	(38 „)	„ 25th February. „ 27th May.
Stroud Road	„ 4.	(20 „)	„ 26th February 1896.
	„ 5.	(20 „)	„ 12th March 1896.
	„ 6.	(20 „)	„ 17th March 1896.
	„ 7.	(20 „)	„ 4th April 1896.
	„ 8.	(30 „)	„ 6th April 1896.
	„ 9.	(30 „)	„ 19th April 1896.
	„ 10.	(38 „)	„ 2nd May 1896.
	„ 11.	(38 „)	„ 12th May 1896.
Total -		318 beds.	

The above table gives the number of beds (for adults) for which each block was intended; but, as many of the patients were young children some of the blocks were used for a larger number than that stated in the table.

In addition to the blocks above-mentioned the sanitary authority erected two large blocks for the nurses engaged at the Stroud Road Hospital; also an additional laundry, and a building for working a Washington Lyon's improved steam disinfector, which was purchased in January 1896.

Hospital Staff.—Prior to the outbreak of small-pox, the permanent staff at the hospital consisted of the caretakers (man and wife), who had both had considerable experience in the nursing of patients, and a messenger; but other nurses and servants were appointed when required.

During the progress of the small-pox epidemic the staff was from time to time increased until, at the end of April last, it comprised :—

Paid Staff.—Medical officers, four, in addition to Medical Officer of Health (three at Stroud Road, and one at Hempsted); custodians, two; charge nurses, 10; other nurses, 33; laundresses and other servants, 10; disinfecting men, four; porters, two; and messenger, one.

Volunteers (*unpaid*).—Two sisters of the Order of St. John the Baptist, Clewer, from St. Lucy's Home.

Two nurses from Children's Hospital.

Two other trained nurses, one taking the place of one of the sisters.

One untrained nurse.

My first visit to these hospitals was made on 3rd April 1896. On that day there were 155 patients in the Stroud Road hospital, and 55 at Hempsted, the majority being children. Both buildings were fully occupied, indeed the first-named contained more than it could well accommodate; several large double beds having two or even four occupants, namely, with children of five years and under who were convalescing from small-pox. The primary object of my visit being to see the patients, I did not think it incumbent upon me to inspect the hospital or inquire into the administration. I can only say that even with this regrettable overcrowding (due to an attempt to isolate every case) the wards struck me as being provided with ample cubic space, as well as well lighted and ventilated. The medical charge of the Stroud Road hospital was being undertaken by Mr. Pitt, under the direction of the Medical Officer of Health, and I was impressed by the zeal and devotion which Mr. Pitt showed and with the overwhelming amount of work which fell to his lot. Under these exceptional circumstances it can hardly be wondered at that administration had to give way to the imperative calls for medical attention on the large number of acute cases. It is much to be regretted that earlier steps were not taken to increase the hospital staff so as to have prevented the occurrence of numerous and grave administrative defects which were revealed shortly afterwards when Dr. Brooke, of the Metropolitan Asylums Board, was appointed Superintendent. At the same time it must be remembered that the conditions were such as to tax the utmost resources of any institution. The Hempsted hospital contained in one block many children who had

been transferred during convalescence from Stroud Road. There were also two wards for acute cases. The nursing was being done by sisters from the Clewer House of Mercy; and Mr. Fort, who had the medical charge, visited the building daily.

It will be seen from the annexed plans that the ground upon which the hospital stands has become considerably surrounded by dwellings since it was first opened. Many new roads have been formed or are in process of formation, the houses in them being for the most part semi-detached villas or short tiers of terraces. The ground that is still open and that is not taken up by the hospital site is used for allotments and pasturage.

§ 7.—Vaccination in Gloucester.

The subjoined return of the vaccinations in the Gloucester Union for the 10 years 1885–1894, demonstrates the fact that the number of children under the age of 10 who had not been vaccinated at the time of the outbreak of small-pox was considerable. It will be seen that a great rise in the number of those in default commenced in 1887, and in February of that year the board of guardians, by a majority of 12 votes, resolved—"That the vaccination officers take no further steps "in vaccination prosecutions until authorised by this Board."*

Gloucester Union.

Year.	Number of Births returned in the "Birth List Sheets" as registered.	Number of these Births duly entered in Columns 10, 11, and 13 of the "Vaccination Register" (Birth List Sheets), viz.:—				Number of these Births which remained unentered in the "Vaccinated Register" on account (as shown by the Report Book) of			Number of these Births remaining neither duly entered in the "Vaccination Register" (columns 3, 4, 5, and 6 of this Return), nor temporarily accounted for in the "Report Book" (columns 8, 9, and 10 of this Return).	Remarks.
		Col. 10.	Col. 11:		Col. 13.	Postponement by Medical Certificate.	Removal to Districts the Vaccination Officer of which has been duly apprised.	Removal to Places unknown or which cannot be reached; and cases not having been found.		
		Successfully vaccinated.	Insusceptible of Vaccination.	Had Small-pox.	Dead Unvaccinated.					
(1.)	(2.)	(3.)	(4.)	(5.)	(6.)	(8.)	(9.)	(10.)	(11.)	
1885	1,447	1,148	—	—	145	32	3	42	77	77 summoned before magistrates and fined.
1886	1,467	1,095	—	—	106	24	1	62	179	50 summoned before magistrates and fined; 129 in default.
1887	1,468	472	—	—	132	2	2	74	786	In February of this year the vaccination officers were ordered to take no proceedings.
1888	1,438	140	—	—	157	5	—	84	1,052	In default 8,965.
1889	1,526	95	—	—	161	1	—	77	1,192	
1890	1,445	60	—	—	183	—	—	66	1,136	
1891	1,551	34	—	—	204	—	1	109	1,203	
1892	1,518	39	—	—	160	—	—	86	1,233	
1893	1,515	38	—	—	174	—	—	97	1,206	
1894	1,492	34	—	—	187	—	—	114	1,157	
Totals	14,867	3,155	—	—	1,609	64	7	811	9,221	

11th April 1896.

L. G. H. Mayer,
Clerk to the Guardians,
Gloucester Union.

* The Vaccination Committee of the Board of Guardians, which reported in August 1896, includes in its report the following statement of the public and private vaccinations registered during the last 10 years:—

1886	1,095
1887	472
1888	140
1889	95
1890	60
1891	34
1892	39
1893	38
1894	34
1895	371
Total for 10 years	2,378

In November 1895 (when the number of cases had only reached about a dozen) the Sanitary Committee authorised the Medical Officer of Health to report the facts to the Guardians, and when doing so the Medical Officer strongly urged the importance of vaccination.

On the 13th January 1896, the Medical Officer reported to the Sanitary Committee that there were 36 cases in the hospital, and that several additional cases had been notified and would be admitted into the hospital during the day; and by direction of the Committee the town clerk wrote to the Guardians "strongly urging them to "enforce the provisions of the Vaccination Acts, and to encourage vaccination and "re-vaccination in order to prevent the further spread of the disease."

On the same date (13th January) the Sanitary Committee instructed the Medical Officer of Health to at once report the facts to Dr. Batten (the senior physician on the infirmary staff), and through him invite the advice and co-operation of the members of the medical profession in dealing with the outbreak.

A meeting of the profession (convened by Dr. Batten) was held at the Guildhall on the 16th January when resolutions were passed recommending increased hospital accommodation, and strongly urging vaccination.

"At a Meeting of the Medical Profession of this City, convened by Dr. Batten in consequence of on official communication from the Sanitary Committee with reference to the Epidemic of Small-pox, held at the Guildhall, on Thursday, the 16th day of January 1896.

"PRESENT:

"Dr. Batten in the chair, and 21 other medical men.

"Resolved :—

"That this meeting of the medical profession of the City of Gloucester, in response to the courteous invitation of the Urban Sanitary Committee for advice and assistance in the present serious outbreak of small-pox, desires to express its readiness to assist the Sanitary Authority and its *unanimous* opinion :—

(1.) That the accommodation at the Hospital for Infectious Diseases should be at once increased; and that the plans should be such as will admit of still further extension, if necessary, so that every case of small-pox may be removed from the home to the hospital without delay.

(2.) That we have *no hesitation whatever* in expressing our belief that "successful" vaccination in early life and re-vaccination at a proper interval afterwards is an effective and the only available means of protection against an attack of small-pox, and that it is the duty of all parents to provide such protection for their children.

(3.) That the Guardians be urged to comply with the provisions of the Vaccination Acts and the General Order made by the Local Government Board thereunder, and in particular with Article 16 of such Order; and also to instruct the vaccination officers to fully carry out their duties under the said Acts and Order.

(4.) That it is desirable that steps be taken by a house-to-house visitation, and (with the co-operation of the school authorities) by examination of the children attending the elementary schools, to prepare lists of unvaccinated persons with a view to insure their prompt vaccination.

(5.) That in view of the intimate relations of the city and rural districts, especially in their suburban connexions, it is expedient, both in regard to efficiency and economy, that the Urban Sanitary Authority and the Rural District Council should combine to provide such permanent accommodation as may be necessary to meet any future outbreak of infectious disease.

Resolved also :—

That copies of these resolutions be sent to—

The Gloucester Urban Sanitary Authority,
The Guardians of the Poor of the Gloucester Union,
The Rural District Council,
The Local Government Board,
The Local Press, and
The Medical Press.

RAYNER W. BATTEN,
Chairman.

On the 28th January the Medical Officer of Health presented a further report giving information asked for by the Guardians, and a copy thereof was sent to the Guardians.

On the 11th March the Sanitary Committee wrote urging the Guardians to "consider "the expediency of appointing additional public vaccinators, and offering further "facilities for vaccination."

On the 18th March the Committee approved of a "circular to employers," urging the extreme importance of prompt vaccination. About 450 copies of this circular were sent out.

"*Private Circular to Employers.*

"SMALL-POX.

"Having regard to the very serious consequences resulting from the prevalence of small-pox in this city, the Sanitary Committee of the corporation request employers of labour to urge upon their employees the extreme importance of vaccination.

"The Committee are giving every attention to general sanitary precautions, but are advised that vaccination and isolation are the only reliable means of checking the epidemic; and they are assured that if the vaccination of children and re-vaccination of adults were promptly and thoroughly carried out there is every reason to hope that the disease would be at once checked and very soon stamped out.

"In addition to the distress occasioned to the families of those afflicted, the epidemic is very seriously affecting the trade and welfare of the city; and unless promptly checked, it may at any moment interfere with and possibly result in the closing of various works and other centres of employment, just as it has already necessitated the closing of several of the public elementary schools.

"Although most anxious not to cause unnecessary alarm or to give undue publicity to a state of things which everyone must regret, the Sanitary Committee feel it their duty to ask employers of labour to *privately* lay these facts before their employees and urge them to assist the Sanitary Authority to check the epidemic by at once arranging for the vaccination of the children and the re-vaccination of themselves and other adults in their respective households, and by inducing their friends and neighbours to adopt a similar course. It may be well to intimate that all persons may be vaccinated (with calf lymph if desired) without any charge.

"The committee trust that all citizens, including those who hitherto have been opposed to vaccination, will under existing circumstances give due consideration to this strong and unanimous recommendation, especially as it is supported by the unanimous opinion of all the medical men in the city.

"Signed by direction of the Sanitary Committee,

"GEO. SHEFFIELD BLAKEWAY,
"Town Clerk.

"JOHN CAMPBELL, M.D.,
"Medical Officer of Health.

"Guildhall, Gloucester,
"13th March 1896."

On March 24th, at the Board of Guardians, a resolution moved by the Rev. J. H. Seabrook, seconded by Mr. Dennis Reardon, was carried by a majority of nine, 31 voting in its favour and 22 against. It was—

> "That the vaccination officer of this union be hereby directed to carry out Article 16 of the General Order of the Local Government Board of the 21st October 1874 relating to vaccination, in accordance with the terms of the resolution passed by this board in September 1876."

On the 27th March the Local Government Board replied to the letter of the Sanitary Authority advising that under existing circumstances the only means that could be relied on to control the further diffusion of small-pox would be the immediate organisation of a general system to procure the prompt vaccination of all unvaccinated persons under 14 years of age, and the re-vaccination of all persons over 10 years of age who had been primarily vaccinated in infancy.

"SMALL POX.

"(*Copy Letter.*)

No. 40,055 K2.
1896.

"Local Government Board,
"Whitehall, S.W.,
"27th March 1896.

"SIR,

"I AM directed by the Local Government Board to acknowledge the receipt of your letter of the 18th instant respecting the outbreak of small-pox at Gloucester, and to state that they learn that, notwithstanding the adoption of the Town Council of such steps as—

(*a*) The prompt isolation, at first, of every case of small-pox notified. (*b*) The subsequent extension of small-pox hospital accommodation. (*c*) The burning of infected articles. (*d*) The disinfection of houses, &c., and (*e*) the imposition of "quarantine" so called, on the occupants of infected dwellings, yet the disease is still extending in the city.

"the Board are advised that, under existing circumstances, the only means that can be relied on to control the further diffusion of small-pox will be the immediate organisation of a general system to procure the prompt vaccination of all unvaccinated persons under 14 years of age, and the re-vaccination of all persons over 10 years of age, who have been primarily vaccinated in infancy. They trust that the decision which was come to by the Guardians on the 24th instant, to enforce the compulsory clauses of the Vaccination Acts, will be accompanied by the adoption of immediate arrangements with a view to this end.

I am, &c.
(Signed) S. B. PROVIS,
Assistant Secretary."

G. Sheffield Blakeway, Esq.,
Town Clerk,
Gloucester.

Copies of this letter were printed and published throughout the city, and prints thereof were sent to the Guardians, with a letter expressing the opinion of the Committee that although many persons had been vaccinated, the steps theretofore adopted were altogether inadequate, and urging the immediate organisation of a general system to carry out the work promptly as recommended by the Local Government Board.

On the 31st March the mayor and others attended a meeting of the Guardians, which was also attended by Dr. Parsons from the Local Government Board, but the arrangements made by the Guardians were not considered satisfactory, and the Sanitary Authority thereupon employed six medical men to make house-to-house visits and vaccinate persons willing to be vaccinated.

Towards the end of April the Sanitary Committee again urged upon the Guardians that the vaccinating staff was inadequate, and (acting under the advice of Dr. Sweeting of the Local Government Board) the Guardians thereupon arranged for the appointment of a full staff of vaccinators, under the direction of Dr. Bond, assisted by Dr. Carter.

The work done by this Vaccination Committee is given in full detail in the Report which has just been issued (August 1896). Six medical practitioners were appointed as assistant vaccinators; and the city was mapped out into 13 districts, to each of which was appointed an inquirer, whose duty it was to make a house-to-house visitation to find out those who were still not vaccinated. Their work, which commenced on April 27th, was followed by the visits to each house requiring it, of the deputy public vaccinator. Calf lymph was employed, several sources of supply being drawn up.

The amount of vaccination that has been done by this means, by increasing the number of stations and otherwise, is expressed in the data supplied in the two tables subjoined which appear in the Appendix to the Vaccination Committee's Report.

Record of children born in the Gloucester District during the 10 years ending December 31st, 1895, and of their relations to vaccination :—

Total births (1) - - - - - - -	15,682
Children under 10 years of age vaccinated prior to January 1st, 1896 (2)	2,378
„ „ „ since „ „ (3)	8,400
„ „ dead to date - - -	3,176
„ „ gone away from Gloucester - -	849
„ „ who have had small-pox and have recovered - - - - - -	523
Children known to be unvaccinated - - - - -	209
„ under three months old - - - -	200
	15,735
From above - - - -	15,682
Balance, being surplus - -	53

(1.) Obtained from the registrars of births and deaths.
(2.) „ „ registers of the vaccination officers.
(3.) This number includes vaccinations registered by (*a*) the special staff appointed by the board of guardians; (*b*) the ordinary public vaccinators and their personal assistants; (*c*) the staff employed by the city council; (*d*) the medical officers of the various public institutions; (*e*) the other medical practitioners of the city. In the case of the first four of these categories the numbers may be relied on as nearly exact, but in the last the number is only approximate, some of the medical practitioners not having kept an exact record of their primary vaccinations.

Gloucester Board of Guardians.

Return of Vaccinations and Re-Vaccinations from January 1, 1896, *to July* 11, 1896, *as ascertained from all known Sources.*

Vaccinators.	Primary.	Re-Vaccinations.	Total.
Vaccination Inquiry Office staff - -	756	1,098	1,854
Public Vaccinators - - -	5,477	12,423	17,900
Corporation staff - - -	424	956	1,380
Private practitioners* - - -	1,827	11,875	13,702
	8,484	26,352	34,836
Number of children, 10 and under, who are stated to have beeen vaccinated in infancy - - - -	1,072	—	1,072
	9,556	26,352	35,908

* From one medical practitioner no returns at all were received.

§ 8.—The District Nursing Society.

One commendable feature of the present outbreak of small-pox has been the charitable work done by the District Nursing Society in providing nursing attendance upon any case which was retained at home. As the epidemic increased the resources of this Society were fully taxed, but it received support and encouragement on all hands, and proved to be of inestimable service to many families attacked by the disease. Through the kindness of Mr. H. E. Waddy, the Treasurer of the Society, I have been furnished with full particulars of its operations, which I herewith append.

"The Committee of the Gloucester District Nursing Society, noticing that the hospital accommodation was perfectly inadequate to cope with the epidemic, in the beginning of March 1896 offered to undertake the nursing outside the hospital which was evidently necessary, and for which there was no provision in existence.

"This offer was accepted by the Sanitary Authority and by the Board of Guardians, and the society took the earliest possible steps to engage the requisite staff of nurses,

which had to be totally distinct from their ordinary nursing staff, who at the present moment are carrying on their ordinary nursing work.

"Their superintendent (Miss Evans) placed a deputy at the permanent Nurses' Home, and herself took the management of the small-pox nursing.

"The work was at first very arduous until sufficient nurses could be got together, but those two or three who were first engaged placed their hearts and souls in the work, and with the superintendent (who also nursed), managed to do what was requisite for some 100 or more cases, with which they commenced.

"Within a fortnight the society had a staff of some dozen nurses, trained for small-pox and coming from St. John's House, Norfolk House, and similar other establishments.

"The society has had, for about three months, 20 or more such specially trained nurses, and they employed some 20 or 30 men and women as assistants, to stop in the various houses and carry out the trained nurses directions during their absence.

"The nursing is now (June) somewhat lessening, and the society have slightly reduced its staff.

"Latterly it has had to take up cases which have been operated upon by persons who, without, and in fact contrary to, the directions of the medical men, bathe the patients in a reckless manner and then leave them as cured, when in the opinion of the medical men they are not cured and are still infectious.

"The nurses necessarily distribute a large quantity of eggs, fruit, food, flowers, &c., and they have undertaken with the Guardians that they will do what is necessary in relief for the first 24 hours, and as a fact they do not limit their distribution to this period.

"*Procedure.*

"The society's procedure is as follows:—

"Halfpenny cards are placed in the hands of the medical men and the authorities.

"The Sanitary Authority every morning sends to the society's superintendent a list of all notifications they have during the preceding day received.

"From these particulars the superintendent arranges the work among the nurses according to each nurse's district. On the nurse's return from her work she writes on Form Ka (new case of small-pox) answers to certain questions.

"That form is sent to the society's office, and from it Returns S. and G. are respectively made out (being altered as necessary) are sent to the Sanitary Authority and to the relief committe of the Board of Guardians.

"If the requirement in Returns S. and G. are not duly complied with the superintendent writes the facts on the Form Q., and sends it to the society's office, from whence a special communication (in writing) is made to the defaulting authority. This procedure is repeated until the requirements are met, the Form Q. being from time to time sent back to the nursing superintendent with Form Ac. attached to it. On this latter form the superintendent or nurses make their remarks and return the whole to the society's office.

"If difficulties arise the chairman attends at the committee of the Sanitary Authority or Guardians, as the case may require.

"As a rule the nurses are well received and their visits are looked forward to by the patients.

"Since the beginning of March the society has had over 900 small-pox cases under its care.

"*On the Termination of Nursing.*

"A Notification Form is made by the superintendent to the society's office.

"From the information thus gained returns are made out, and sent to the Sanitary Authority, and to the relief committee of the Board of Guardians.

"*Financial Matters.*

"The Nursing Society immediately they undertook the special nursing, issued an appeal to the residents in the county and the city, and the same has been answered most generously, and all classes, rich and poor, have come forward to provide the Nursing Society with means.

"The society has spared no expense in endeavouring to fulfil its part of the work, and from the systematic and energetic action of its superintendent such work has proceeded most smoothly.

"The society itself is a small one, and its ordinary subscription list is less than 200*l.* per annum.

"*Country Nursing.*

"The society has placed itself in a position to undertake the nursing of small-pox patients in all the parishes of the Gloucester Union.

"It has made suggestions to each parish with regard to it being prepared, by sending round to the chairman of each parish council a circular, and the society is ready at any moment to send trained nurses, and to pay for the women to be provided as assistants. It is believed that most of the parishes have got themselves ready in one or other of the ways indicated in the above circular, but to further insure this being done, the society in May issued a circular emphasizing the necessity for prompt treatment in the earliest stage, and pointing out that the society was prepared to immediately send the necessary nurses.

"The society has all its machinery ready to be put in operation at any moment in a manner very similar to that adopted as above mentioned in the city.

"George Whitcombe,
"June 1896. Chairman of the Special Nursing Committee."

Addendum to Part I.

Small-Pox in Gloucester in 1872–75.

Since writing the paragraphs referring to the previous occurrence of small-pox in Gloucester (page 22), I have been enabled through the courtesy of Mr. Mayer, the superintendent registrar, to consult the death registers for the years 1872–75, and have thereby gained some information concerning the mortality from small-pox in these years. In 1872 there were seven deaths from this disease, viz., January, one; March, one; April, one; May, two; October, one; November, one. In 1873 there were 49 deaths, viz., January, two; May, four; June, five; July, four; August, two; September, four; October, 11; November, nine; December, eight. In 1874 there were 97 deaths, viz., January, six; February, seven; March, four; April, two; May, three; June, 15; July, 21; August, 11; September, 10; October, five; November, nine; December, four. In 1875 there were seven deaths, viz., January, five; February, two; and none afterwards during the whole year. So that during the whole period of three years and two months there were 160 deaths from small-pox.

But it is clear that prior to May 1873 the disease could hardly be considered to be epidemic, there having been only nine deaths during the preceding 16 months, and, for three months preceding May, no deaths at all. From May 1873 to February 1875 no month passed without some fatalities, the greatest number occurring in July 1875. This outbreak may therefore be said to have lasted 22 months and to have caused 151 deaths.

The distribution of these fatal cases of small-pox in the various registration districts may be compared with that of the present outbreak. Then, as now, the majority of the cases seem to have been in the South Hamlet :—

District.	1873.	1874.	1875.	Total.
1. Kingsholm - - -	7	12	2	21
2. St. Nicholas - -	18*	38†	2‡	58
3. South Hamlet - -	19	26	3	48
4. St. John Baptist - -	3	21	—	24
	47	97	7	151

* 3 deaths in the Union Workhouse Infirmary.
† 22 „ „ „
‡ 2 „ „ „

The workhouse infirmary was used as an isolation hospital, and received cases from all parts of the city, hence the excess of deaths registered in the St. Nicholas district where the workhouse is situated. This fact renders it impossible to give an accurate estimate of the numbers attacked in each locality.

The only other point on which it is possible from these returns to get precise information is as to the age-distribution of these fatal cases of small-pox. It is as follows :—

Age.	1873.	1874.	1875.	Total.
1 month and under - -	2	2	—	4
1 month to 1 year - -	3	7	3	13
1 to 5 years - - -	3	8	1	12
5 „ 10 „ - -	6	16	—	22
10 „ 15 „ - - -	8	10	—	18
15 „ 20 „ - -	5	10	2	17
20 „ 30 „ - - -	9	24	1	34
30 „ 40 „ - -	4	9	—	13
40 „ 50 „ - - -	6	7	—	13
50 „ 60 „ - -	—	3	—	3
60 „ 70 „ - - -	1	1	—	2
	47	97	7	151

In other words, of these small-pox deaths, there occurred at ages—

Under 1 year - -	4, or a proportion of	2·6	per cent.
1 to 10 years - -	47 „ „	31·1	„
10 to 30 „ - - -	69 „ „	45·7	„
30 years and upwards -	31 „ „	20·5	„

The statement as to whether the individuals were vaccinated or not is seldom made, so that no estimate can be framed as to the incidence of the disease upon these two classes of subjects.

PART II.

§ 9. The Outbreak of Small-pox, 1895–96. Early history of outbreak, June to November, 1895. Progress of the epidemic. Its great extension in February. Conditions favouring its spread. Houses invaded during each fortnightly period. Number of cases. Mortality. Table of cases.

§ 10. Spread of Infection through School Influence. Children who were probably infected in the Public Elementary Schools.
Widden Street School.
St. Luke's School.

§ 10. Spread of infection, etc.—*cont.*
Tredworth School.
Linden Road School.
Ryecroft School.

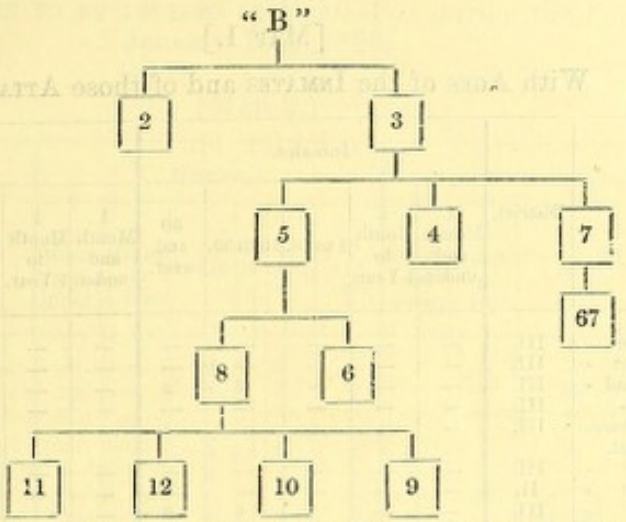
§ 11. Hospital Isolation. Number of cases removed to hospital. Comparison of incidence in houses from which first cases removed, and those in which they remained at home. Cases in hospital at date of opening inquiry. Hospital and home mortality compared.

§9.—Small Pox—1895–96.

Early history of outbreak.

Although during the past few years small-pox has prevailed in various parts of the country in more or less direct communication with Gloucester, and especially in places so nearly related to it as Birmingham, Bristol, and Stroud, it was not until the autumn of 1895 that the city became markedly infected. In the month of June there had been notified the case of a Midland Railway official, who was believed to have contracted the disease at Burton-on-Trent. He was promptly isolated, and no further case arose in connexion with his attack. But, as so often happens, the earliest cases in an epidemic are to be found amongst those whose nature has been unrecognised, or which have been unattended medically and not notified to the authorities. For the next case (in August) which became known was of a lad employed on the premises of a Mr. B., living in the Midland Road. Mr. B. was a commercial traveller, and although he does not appear to have contracted small-pox himself, it is highly probable that he was the medium of its importation into the city, and of the infection of one or more members of his family, whose cases were not notified. The lad referred to lived in Goodyer Street, and was not known to have infected others; but the inquiries subsequently made by Dr. Campbell, to whom I am indebted for this information, seemed to furnish the clue to other cases that subsequently arose in the city. Thus the third case notified was a fellow-shopman to a friend of Miss B., who herself had a mild attack, and went to Scotland on her recovery. I do not know whether she actually visited the shop whilst still infectious, but it is notorious that the spread of small-pox is often to be traced to individuals suffering from such mild attacks that they are able to go about. At any rate it is a singular coincidence that there should be even this indirect relationship between these cases. The next link is to be found in the probable infection of a young girl, a friend of No. 3, who was employed as nursemaid in the K. family, in Derby Road. The girl herself (No. 5) sickened in September, her case being notified on the 28th of that month; whilst the infant K. (No. 6) was attacked a few days later. On October 27th there died at a neighbour of the K's, the child E.M., 8 years of age, from what was certified as "malignent measles." She was unvaccinated, and had been taken ill on October 21st. There are eight children in this family, one other (D.M. at 5) being also unvaccinated. In the first week of November two of the children, including the last-named, and subsequently the father, were attacked with small-pox and removed to the hospital (Nos. 9, 10, 12); and at the same time a lady, who had visited the child first attacked, was also attacked. It is hardly consistent with ordinary ideas of the incubation period of small pox to believe that the child D.M. was directly infected by No. 5, although it is certain by the fact that this girl did come into the house before her illness was declared. She was removed to hospital on September 28, *i.e.*, 23 days before the child was taken ill in the M. family. Reverting to the case No. 3, it may be mentioned that Dr. Campbell has evidence of the infection through him of two other cases besides that of No. 5. These early cases, which form, as it were, a series apart, and from which it is possible that

other cases may have arisen, may be diagrammatically represented in their connexions, thus :—



Scattered cases continued to arise through November and December, in various quarters of the city, so that by the end of the year there had been notified, since the middle of June, 27 cases.

It is not possible to trace the connexions between the cases that now began to increase in number, although it was not until the third week in February that the disease assumed serious proportions. In order that an accurate idea may be formed of the manner of its spread I have prepared a series of spot-maps (placed at the end of this Report, p. 182), of which the first shows the houses invaded up to January 4th, 1896, and the rest those in each succeeding fortnight to July 18th. I have also prepared lists of these houses, indicating the cases of small-pox that occurred in them, as well as the total number of the inmates of these houses of which this information was obtained, grouped in age periods.

The maps are prepared from one which is published by Mr. John Jennings of Gloucester, whom I beg to thank for his kindness in granting permission to utilise it for this purpose.

In the following paragraphs will be given a summary of the facts as to incidence in each of the 15 sections, into which the whole period has been arbitrarily divided.

I.

Progress of the epidemic; invaded houses.

June 15th, 1895, *to January 4th*, 1896.—There are known to have occurred in these 30 weeks 33 cases of small-pox, which came from 25 houses, in which subsequently 8 other cases arose. Of these 41 cases, 5 were fatal.

16 houses yielded	1	case	of	small-pox.
6 „ „	2	cases		„
2 „ „	4	„		„
1 „ „	5	„		„

As to their situation,—

1. Kingsholm - -	No houses.		
2. St. Nicholas - - -	2	„	with 4 cases.
3. South Hamlet - -	22	„	„ 33 „
4. St. John Baptist - -	1 house		„ 4 „

The *age* incidence of those attacked in these 25 houses was :—

1 month and under - - -	1 case,	1 death.
1 „ to 1 year - -	—	—
1 to 10 years - - -	11 cases	3 deaths.
10 to 30 „ - - -	22 „	1 death.
30 and over - - - -	7 „	—
	41	5

There were removed to hospital* 36, of whom 3 died.

There remained at home 5, of whom 2 died.

* That is of the 41 cases which occurred in these invaded houses, not the number actually removed during the period.

List of Houses known to be Invaded by Small-Pox during the Period June 1895 to Week ending January 4th, 1896.

[Map 1.]

With Ages of the Inmates and of those Attacked.

No. in House List.	Address.	District.	Inmates.					Cases.*				
			1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.	1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.
1	74, Rycroft Street	III.	—	—	—	—	—	—	—	—	—	1
2	5, Goodyer Street	III.	—	—	—	—	—	—	—	—	2	—
3	68, Vauxhall Road	III.	—	—	—	3	2	—	—	—	3	—
4	8, Upton Street	III.	—	—	—	—	—	—	—	—	4	—
5	8, Vauxhall Terrace, Milbrook Street.	III.	—	—	—	—	—	—	—	—	5	—
6	77, Derby Road	III.	—	—	—	—	—	—	—	6	—	—
7	7, Counsel Street	II.	—	—	—	—	—	—	—	—	7	67
8	9, Derby Road	III.	—	—	2	6	2	—	—	*8*, 10	9	12
9	42, Derby Road	III.	—	—	—	1	2	—	—	—	—	11
10	5, Moor Street	III.	—	—	—	—	—	—	—	—	*13*, 17	—
11	16, King's Barton Street.	III.	—	—	—	—	—	—	—	*14*	—	—
12	2, Fowey Villa, Conduit Street.	III.	—	—	—	6	2	—	—	—	15	—
13	3, Conduit Street	III.	—	—	—	1	1	—	—	—	16	—
14	Laurel Villa, Stroud Road.	III.	—	—	—	—	—	—	—	—	—	18
15	45, High Street	III.	—	—	3	—	1	—	—	19, 53	—	—
16	27, Knowles Road	III.	—	—	3	2	—	—	—	44	20	—
17	38, Morton Street	III.	—	—	2	2	2	—	—	—	21, 28	—
18	12, Sinope Street	III.	—	—	1	2	1	—	—	—	22	—
19	4, Wells Cottages, Sherborne Street.	IV.	—	—	—	—	—	*23*	—	39	30, 31	—
20	2, Upper Cecil Road	III.	—	—	—	—	—	—	—	—	24	—
21	17, Milbrook Street	III.	—	—	2	3	1	—	—	34, 45	25, 36	39
22	Lorne Villa, Stroud Road.	III.	—	—	—	—	—	—	—	—	—	26
23	5, Barbican Road	II.	—	—	—	—	—	—	—	*55*	27	—
24	14, Stratton Road	III.	—	—	—	—	—	—	—	—	32	—
25	60, Clifton Road	III.	—	—	2	1	3	—	—	—	33	—

* The figures in these columns refer to the Table of Cases, p. 70 *et seq.* Those printed in *italics* denote fatal cases.

II.

January 5th to 18th, 1896.—The number of cases known to have occurred in this fortnight was 25, there being new invasions of 14 houses. Altogether these houses yielded 29 cases, of which 8 were fatal:—

6 houses yeilded 1 case of small-pox.
4 „ „ 2 cases „
2 „ „ 3 „ „
1 „ „ 4 „ „
1 „ „ 5 „ „

Their situation was:—

2. St. Nicholas - - 2 houses with 3 cases.
3. South Hamlet - - 9 „ „ 18 „
4. St. John Baptist - - 3 „ „ 8 „

The *age*-incidence of those attacked in these 14 houses was:—

1 month to 1 year - - -	2 cases,	2 deaths.
1 to 10 years - - - -	16 „	3 „
10 to 30 „ - - -	4 „	—
30 and over - - - -	7 „	3
	29	8

There were removed to hospital 28, of whom 8 died.
Remained at home 1.

LIST OF HOUSES KNOWN TO BE INVADED BY SMALL-POX during the Fortnight ending January 18th, 1896.

[MAP 2.]

No. in House List.	Address.	District.	Inmates.					Cases.				
			1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.	1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.
26	24, Theresa Street -	III.	—	—	2	3	2	—	—	—	—	37
27	2, Guinea Street -	II.	—	—	4	3	2	—	—	38	—	—
28	3, Wells Cottage, Sherborne Street.	IV.	—	—	—	—	—	—	—	—	40	—
29	80, New Street -	III.	—	—	2	2	2	—	—	42	61	*41*
30	9, Counsel Street -	II.	—	1	2	2	3	—	—	*71*	45	—
31	8, Albany Street -	III.	—	1	3	1	1	—	*46*	47, 51	—	—
32	7, Albany Street -	III.	—	—	2	4	2	—	—	*48*, 50	—	—
33	4, Vauxhall Terrace, Milbrook Street.	III.	—	—	—	3	3	—	—	—	—	49
34	10, High Orchard Street.	III.	—	—	4	2	1	—	—	*57*, 68 69, 70	—	—
35	44, New Street -	III.	—	—	5	2	2	—	—	79	52	—
36	17, St. John's Lane -	IV.	—	—	—	—	—	—	*62*	43, 65	—	63, 64
37	70, Melbourn Street -	III.	—	—	2	—	2	—	—	—	—	54
38	28, Blenheim Road -	III.	—	—	—	—	—	—	—	—	—	*56*
39	29, Longsmith Street	IV.	—	—	3	2	2	—	—	58, 75	—	—

III.

January 19th to February 1st, 1896.—During this fortnight some encouragement was given to the hope that the outbreak was abating. There were 24 cases known to have arisen, but the number of newly invaded houses had fallen to 10. These 10 houses yielded 16 cases, of which three were fatal:—

7 houses yielded 1 case of small-pox.
1 house ,, 2 cases ,,
1 ,, ,, 3 ,, ,,
1 ,, ,, 4 ,, ,,

Their situation was:—

1. Kingsholm - - - - 1 house, 2 cases.
3. South Hamlet - - - 8 ,, 13 ,,
4. St. John Baptist - - - 1 ,, 1 ,,

The *age*-incidence of those attacked in these 10 houses was:—

1 month to 1 year - - -	1 case.	
1 to 10 years - - - -	2 ,,	1 death.
10 to 30 ,, - - -	5 ,,	—
30 and over - - -	8 ,,	2 ,,
	16	3

One was a case of a man employed on a ship in the docks (No. 1,977), who infected two other members of his family.

There were removed to hospital 16, of whom 3 died.
Remained at home none.

List of Houses known to be Invaded by Small-Pox during the Fortnight ending February 1st, 1896.

[Map 3.]

No. in House List.	Address.	District.	Inmates.					Cases.				
			1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.	1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.
40	26, Sidney Street -	I.	—	—	1	2	2	—	—	—	59, 77	—
41	39, Robin Hood Street.	III.	1	—	3	2	2	—	—	—	60, 84	1,977
42	Shakespeare Passage	IV.	—	—	—	—	—	—	—	—	—	66
43	107, Falkner Street -	III.	—	—	4	4	2	—	—	—	72	—
44	80, Victoria Street -	III.	—	—	—	—	2	—	—	—	—	73
45	59, Brook Street -	III.	—	—	1	3	2	—	—	—	—	74
46	Bleak House, Station Road.	III.	—	—	—	—	—	—	—	—	—	76
47	8, Carmarthen Street	III.	—	1	1	—	2	—	108	102	—	78, 127
48	9, Baker Street -	III.	—	—	1	—	2	—	—	80	—	—
49	51, High Street -	III.	—	—	—	2	2	—	—	—	—	81

IV.

February 2nd to February 15th.—There were 28 additional cases of small-pox during this fortnight, and 22 houses newly invaded, a notable increase on the preceding fortnight. There occurred in all, in these houses, 52 cases, of which nine proved fatal :—

11 houses yielded each 1 case of small-pox.
4 „ „ 2 cases „
2 „ „ 3 „ „
2 „ „ 4 „ „
1 „ „ 5 „ „
1 „ „ 6 „ „
1 „ „ 8 „ „

The circumstances of the family in which eight cases occurred may be related. These cases continued to arise until the middle of May, so that the house was infected for fully three months. All the children were attacked, the parents alone escaping. The house (No. 56 in list), in Moor Street, is old and incommodious. All but one (No. 330, a lad of 17) were unvaccinated, and two of the patients died (No. 101, a boy of 11, and No. 1,671, a boy of 3).

In another house (No. 67) the father was the first to be attacked, then four unvaccinated children, aged 10, 8, 6, and 3 respectively (Nos. 606, 352, 353, 405), the three youngest dying. The mother and two remaining children of the family escaped; they were all vaccinated.

The houses newly invaded during this fortnight were situated in two districts only, viz. :—

3. South Hamlet - - - 21, with 51 cases.
4. St. John Baptist - - - 1 „ 1 „

The *age*-incidence of the 52 cases was :—

1 month to 1 year - - -	1 case.	
1 to 10 years - - - -	22 „	5 deaths.
10 to 30 „ - - -	13 „	2 „
30 and over - - -	16 „	2 „
	52	9

There were removed to hospital 33, of whom 8 died.
Remained at home 19, of whom 1 died.

List of Houses known to be Invaded by Small-Pox during the Fortnight ending February 15th, 1896.

[Map 4.]

No. in House List.	Address.	District.	Inmates.					Cases.				
			1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.	1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.
50	5, Napier Street -	III.	—	—	—	4	2	—	—	—	82	—
51	Sidney Villa, St. Paul's Road.	III.	—	—	—	—	—	—	—	—	—	83
52	34, Wellington Street	III.	—	—	—	1	3	—	—	—	85	—
53	58, Howard Street -	III.	—	—	—	—	—	—	—	—	—	*86*
54	2, Rose Villa, Albion Street.	III.	—	—	1	3	1	—	—	87	141	140
55	Quedgley Villa, Bristol Road.	III.	—	—	—	—	—	—	—	—	88	—
56	38, Moor Street -	III.	—	—	6	2	2	—	—	89, 173, 1,416, 1,670 *1,671*, 1,704	*101*, 330	—
57	42, Regent Street -	III.	—	—	—	2	2	—	—	—	—	*90*
58	1, Robin Hood Street	III.	—	1	4	—	2	—	—	180, 184	—	91, 322
59	28, Princes Street -	III.	—	—	—	—	—	—	—	—	92, 126	—
60	46, Castle Street -	III.	—	—	—	—	2	—	—	—	—	93, 177
61	"Tresilian," 40, Hanman's Road.	III.	—	1	—	2	1	—	104	—	97	—
62	6, Sunningdale Terrace, Linden Road.	III.	—	—	—	—	—	—	—	—	—	94
63	21, Stroud Road -	III.	—	—	1	7	2	—	—	—	95	—
64	— Upper Cecil Road	III.	—	—	5	1	2	—	—	96, 492, 493, 501, 1,094	—	494
65	1, Falkner Street -	III.	—	—	2	2	1	—	—	98	386	175
66	2, Clegram Villas -	III.	—	—	2	—	2	—	—	—	—	99, 170
67	6, Dynevor Square -	III.	—	—	3	3	2	—	—	*352, 353, 403*	656	100
68	4, George's Row, Morton Street.	III.	—	—	3	1	2	—	—	—	—	103
69	3, Raglan Street -	III.	—	—	3	—	2	—	—	105, 106, 115	—	143
70	63, Napier Street -	III.	—	—	3	1	2	—	—	107	—	—
71	7, Bedford Street -	IV.	—	—	3	4	2	—	—	—	*109*	—

V.

February 16th to 29th.—A most marked exacerbation of the disease occurred during this fortnight. In the week ending February 15th there had been nine cases, of which only four were in houses not previously invaded. Up to this date there had been, from June 1895, 71 houses invaded, and 79 cases known. But from this time onwards, for a period of four months, the weekly notifications were never less than 47, and, indeed, for eight weeks continued to increase progressively until, in the week ending April 11th, the highest number (211) was reached. During these four months, 980 houses were newly invaded, yielding 1,780 cases in all.

A striking feature of the notifications which occurred during this fortnight was the large proportion of children amongst them. Of 95 cases occurring in the 93 houses which were newly invaded, no fewer than 75 were of children under the age of 10 years, a remarkable preponderance even in an epidemic where children have suffered so extensively. The reason for this was the fact that the majority of them were infected at school, no fewer than 40 of the cases notified during this fortnight attending the Widden Street (Infants) school when attacked, and 25 the St. Luke's (Infants) school in New Street. I propose to enter subsequently into fuller detail upon the incidence of the disease in these schools, but it must suffice here to state that to this cause must undoubtedly be attributed the great dissemination of the disease within the city, and particularly in the quarters whence these children came, that now took place.

There were 114 cases known to have occurred during this fortnight, and 93 houses were newly invaded, in which 231 cases altogether arose, 77 being fatal:—

39 houses yielded each 1 case.
18 " " 2 cases.
15 " " 3 "
8 " " 4 "
8 " " 5 "

1 house yielded 6 cases.
2 „ „ 7 „
1 „ „ 8 „
1 „ „ 11 „

The larger proportionate number of houses having more than one case was in the main attributable to the greater incidence of the disease upon the children of the household.

The houses were located as follows :—

1. Kingsholm - - - -	10 houses,	29 cases.
3. South Hamlet - - -	80 „	192 „
4. St. John Baptist - - -	3 „	10 „

The *age*-incidence of the 231 cases was :—

1 month and under - -	1 case,	1 death.
1 „ to 1 year - -	9 „	8 „
1 to 10 years - - -	131 „	57 „
10 to 30 „ - - -	53 „	3 „
30 and over - - - -	37 „	8 „
	231	77

Of these there were removed to hospital 154, of whom 60 died.
Remained at home 77, of whom 17 died.

Reference may be made to three families amongst those attacked during this period. In No. 94 every one of a family of 11 members had the disease, which began in a child six years old, one of the Widden Street school children. The parents and five children, aged 11 to 17, were vaccinated, and none of these died, but each of the four younger children (from 6 months to 6 years) died; they had not been vaccinated. Another instance of the whole family being attacked is that of house No. 136. Here the parents (35 and 29 years) were the only ones vaccinated; the mother had a mild attack, the father a more severe one. A boy, 5 years old, the first to be taken ill, died; then twin infants (at 4 months); whilst two other children (4 years and 18 months respectively) recovered, the younger having a discrete attack only. In house No. 151 two children out of a family of seven escaped. They, like their parents, had been vaccinated, but both the latter (aged 34 and 32 years) died, as also did four out of the five remaining children (aged from 6 to 1 year); a girl of 8 recovered. These five children were all unvaccinated.

The tables and analysis given hereafter will show to what an extent the incidence of the disease in families fell upon the unvaccinated, but this is almost tantamount to saying that it was an incidence upon the children under 10 years of age, as so small a proportion of children of this class in Gloucester were vaccinated at the time of the outbreak.

List of Houses known to be invaded by Small-pox during the Fortnight ending February 29, 1896.

[Map 5.]

No. in House List.	Address.	District.	Inmates.					Cases.				
			1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.	1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.
72	24, Salisbury Road -	III.	—	—	—	5	2	—	—	—	110	—
73	10, Twyver Street -	I.	—	—	—	2	2	—	—	—	111	—
74	5, Gothic Cottage, Barton Street.	III.	—	—	—	—	—	—	—	*112*	—	—
75	61, Lower Barton Street.	III.	—	—	4	1	2	—	—	*113*	—	—
76	14, Forest Terrace -	III.	—	1	2	3	3	—	*114*	—	—	231, 239
77	20, Blenheim Road -	III.	—	1	2	1	1	—	—	*116*	—	238
78	11, Blenheim Road -	III.	—	—	4	1	2	—	—	117, 224	—	—
79	5, Seymour Road -	III.	—	—	—	—	—	—	—	—	118	—
80	49, Milbrook Street -	III.	—	—	—	—	—	—	—	119	—	—
81	3, Vauxhall Terrace, Milbrook Street.	III.	—	—	4	—	2	—	—	*120*, 1,845	—	—

No. in House List.	Address.	District.	Inmates.					Cases.				
			1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.	1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.
82	132, Milbrook Street	I.	—	—	2	1	1	—	—	121, *232*	—	—
83	10, Napier Street	III.	—	—	2	2	—	—	—	122, 217	216	—
84	3, Windsor Place, Milbrook Street.	III.	—	—	4	—	2	—	—	123	—	—
85	25, Victoria Street	III.	—	—	2	2	2	—	—	*124*	—	—
86	163, Lower Barton Street.	III.	—	—	3	1	2	—	—	125	—	—
87	17, Upton Street	III.	—	—	6	4	2	—	—	128, 129, 647	1,128	—
88	9, Lower Barton Street.	III.	—	—	1	4	3	—	—	130	—	—
89	55, Blenheim Road	III.	—	—	2	2	1	—	—	131, 133	247	—
90	60, Milbrook Street	III.		—	6	—	2	—	—	*132*	—	267
91	Yorkeley Villa, Alfred Street.	I.	—	—	3	3	—	—	—	*134*	—	—
92	38, Midland Road	III.	—	—	—	3	2	—	—	—	136	—
93	Linden Road Board School.	III.	—	—	—	—	—	—	—	—	137	—
94	23, Twyver Street	I.	—	1	3	5	2	—	*314*	*135, 234, 429*	235, 259, 260, 265, 266	236, 268
95	77, Milbrook Street	I.	—	—	3	2	—	—	—	138	—	—
96	30, Widden Street	III.	—	—	4	3	2	—	—	*139*, 230, 993	567, 991	—
97	29, Widden Street	III.	—	—	2	4	2	—	—	142, 341	—	—
98	46, Stratton Road	III.	—	—	—	—	—	—	—	144, 242, *258*	257	241
99	"Beehive," Milbrook Street.	III.	—	—	4	3	1	—	—	145, 245	351	246
100	8, Jersey Road	III.	—	—	3	—	2	—	—	*146*	—	—
101	6, Lady-bellgate	IV.	—	—	4	2	2	—	—	*147, 261, 263*	262	—
102	32, Sinope Street	III.	—	—	1	2	—	—	—	148	1,214	—
103	5, Wellington Street	III.	—	—	3	—	3	—	—	—	—	149
104	38, Falkner Street	III.	—	—	—	2	2	—	—	—	*150*	317
105	Granville Terrace, Alfred Street.	I.	—	—	4	3	2	—	—	*151*, 152	—	—
106	46, Lower Barton Street.	III.	—	1	1	1	3	—	*284*	*153*	—	274
107	90, Alma Place	III.	—	1	4	2	—	—	*1,739*	1,555, 1584	154	—
108	40, Sinope Street	III.	—	1	2	1	1	—	—	*155*	283	1,956
109	25, Widden Street	III.	—	—	3	5	2	—	—	*156, 255, 256*	—	—
110	75, Falkner Street	III.	—	—	2	3	2	—	—	157	303	—
111	50, East End Road	I.	—	1	4	1	2	—	—	158	—	—
112	100, Alma Place	III.	—	—	2	2	—	—	—	196	160, 210	—
113	"Robin Hood," Hopewell Street.	III.	—	1	3	1	5	—	*643*	*159*, 466, 479	—	*291*, 644
114	23, Magdala Terrace	III.	—	—	2	—	3	—	—	*161*	—	—
115	13, Jersey Road	III.	—	—	1	—	3	—	—	*162*	—	—
116	94, Lower Barton Street.	III.	—	—	3	3	1	—	—	163, 575	576, 737	—
117	59, Vauxhall Road	III.	—	—	2	1	2	—	—	164, 583	582	243
118	27, Vauxhall Road	III.	—	—	3	2	2	—	—	165	414, *415*	—
119	37, Victoria Street	III.	—	1	2	3	—	—	—	*166*	286, 584	—
120	27, Magdala Road	III.	—	—	3	—	4	—	—	167	—	278
121	Tweenbrook Villa	III.	—	—	—	—	—	—	—	—	—	168
122	3, Forest Terrace	III.	—	—	2	3	3	—	—	*273, 555*	169, 556, 557	—
123	41, Twyver Street	I.	—	—	4	2	3	—	—	171, 440, 747	873, 874	—
124	16, Barton Terrace	III.	—	—	—	—	2	—	—	—	—	*172*
125	35, Stroud Road	III.	—	1	5	5	2	—	*820*	*174*, 1,142, *1,247*, 827	—	—
126	58, Clifton Road	III.	—	—	—	—	—	—	—	*176*	—	—
127	Fernlea Villa, Seymour Road.	III.	—	—	3	4	1	—	—	*178*	—	—
128	26, Napier Street	III.	—	—	1	1	1	—	—	—	—	179
129	15, Llandilo Street	III.	—	—	—	—	—	—	—	181, 451, *452*	—	346, 672
130	7, Theresa Street	III.	—	—	—	—	—	—	—	182	—	—
131	44, Napier Street	III.	—	—	—	—	—	—	—	183	—	*591, 836*
132	49, Theresa Street	III.	—	—	4	1	1	—	—	185, *318*	—	—
133	61, Theresa Street	III.	—	—	—	—	—	—	—	*186*	301	—
134	37, Howard Street	III.	—	—	—	3	2	—	—	—	187	—
135	39, New Street	III.	—	—	—	—	—	—	—	*188*	—	—
136	46, Alma Place	III.	—	2	3	1	1	—	*323, 324*	*189*, 327, 401	325	400
137	St. Luke Street	III.	—	—	3	1	2	—	—	*190*	—	—
138	4, Somerset Place	III.	—	1	4	1	2	—	—	191	—	390
139	91, New Street	III.	—	—	3	2	—	—	—	*192*	—	—
140	48, Robin Hood Street	III.	—	1	5	2	2	—	364	*193*, 413, 693, 694, 1,161	384	365
141	60, Robin Hood Street	III.	—	—	3	2	—	—	—	*197*	—	—

No. in House List.	Address.	District.	Inmates.					Cases.				
			1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.	1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.
142	85, New Street -	III.	—	—	4	4	1	—	—	*194*	340, 354, 791	—
143	114, Alma Place -	III.	—	—	3	2	2	—	—	195, 380, 382	1,121	378
144	113, New Street -	III.	—	—	3	2	2	—	—	*198*	—	—
145	Florence Villa, St. Paul's Road.	III.	—	—	6	5	2	—	—	*201*	199	—
146	42, Sherborne Street	IV.	—	—	3	3	2	—	—	200, 355, 673	319, 437	—
147	47, Victoria Street -	III.	—	—	2	2	1	—	—	202, *430*	—	—
148	62, Victoria Street -	III.	—	—	—	2	3	—	—	—	203, *971*	481
149	32, Robin Hood Street	III.	—	1	2	—	2	—	—	*204*	—	422, 423
150	Oxford Terrace, London Road.	I.	—	—	3	3	2	—	—	205, *478*, 514	—	—
151	63, Brook Street -	III.	—	—	6	1	2	—	—	*206, 335*, 424, *425*, *426*	—	*310, 339*
152	120, New Street -	III.	—	—	4	5	2	—	—	*207*	439	421
153	65, New Street -	III.	—	—	—	—	—	—	—	208	—	—
154	67, Regent Street -	III.	—	—	1	—	3	—	—	—	—	209
155	43, Theresa Street -	III.	—	—	—	1	—	—	—	211	—	—
156	11, Somerset Place -	III.	—	—	3	4	2	—	—	*212*	—	*403*
157	70, Sherborne Street	IV.	—	—	—	4	3	—	—	—	—	213
158	12, Napier Street -	III.	—	—	1	—	3	—	—	—	—	214
159	49, Alma Place -	III.	—	—	4	4	—	—	—	*215*, 498	499	—
160	Clare Terrace, Cleeram Road.	III.	—	—	2	4	2	—	—	218	—	—
161	49, Robin Hood Street	III.	1	—	3	1	2	*954*	—	*219*, 698, 953	—	—
162	60, New Street -	III.	—	—	5	2	2	—	—	220	—	—
163	20, East End Road -	I.	—	—	4	—	2	—	—	*221, 222*	—	—
164	9, Dainty Street -	III.	—	—	2	2	—	—	—	—	223	—

VI.

March 1st to March 14th.—The epidemic had now assumed such proportions as to be no longer under the control of the sanitary authority. Up to this time nearly every case had been removed to hospital as it arose, and the infected house supervised, the inmates being kept "in quarantine" for 14 days after the removal of the case. But the hospital accommodation had been strained to its utmost; and although the further opening of wards in the unsuitable "cholera hospital" at Hempsted allowed slight relief, yet even this additional accommodation was soon overpassed. As the great majority of the cases were those of children, several of the hospital wards contained more than their allowance of beds. It was, however, of no avail; and, although had the epidemic then abated, the efforts to isolate every case would have been perhaps justified by events, these very efforts resulted in the creation of a feeling of mistrust of hospital treatment, which increased the numbers of those who preferred to remain in their homes after the necessity for their so remaining had passed away.

To this fact, that a large and increasing proportion of cases were retained in their homes, must be ascribed in great measure the continued spread of the disease. Certain localities became especially affected, notably such streets as Alma Place, off the Bristol Road; New Street, off the Stroud Road; Castle Street, to the east of the hospital, and numerous small and thickly peopled streets in the Tredworth district.

The question of aerial infection from the crowded hospital might also be invoked to explain the continuance of the outbreak; but the facilities for contagion, through direct inter-communication of neighbouring families, afford a simpler and possibly a truer reason. It is probable, also, that some of the other schools, referred to later, may have contributed to the spread of infection, until, by the middle of March, they had all been closed by the sanitary authorities.

During this fortnight 207 cases were known to have arisen, and 118 houses were newly invaded. These houses ultimately yielded 257 cases, of which 55 were fatal, a much smaller fatality than occurred amongst the households infected in the preceding fortnight, when so large a proportion of children were attacked.

Of these 118 houses, there were—

58	houses	yielding	1 case.
30	,,	,,	2 cases.
12	,,	,,	3 ,,
6	,,	,,	4 ,,
5	,,	,,	5 ,,
3	,,	,,	6 ,,
1	,,	,,	7 ,,
1	,,	,,	8 ,,
1	,,	,,	9 ,,
1	,,	,,	12 ,,

Again, a few may be selected as examples of the extent to which some families suffered.

House 170.—The first to be attacked was a child of 4 years; she had a confluent attack; then the parents, the father (unvaccinated) dying. Of the three remaining children, an infant died and a girl of 6 had a discrete attack. The mother was the only vaccinated member of the family.

House 189.—The child first to be attacked (infected at school?) died, as did also the mother (aged 28) and two children (7 months and 6 years); one child (No. 513), the only vaccinated member of the family, escaping with a mild attack.

House 194.—Here the father was the only member of a family of 10 who escaped infection. The mother and three elder children (aged 10, 12, 14), who were all vaccinated, escaped with mild attacks; whilst the five younger unvaccinated children (15 months to 9 years) all died.

House 244.—A family of seven, all attacked; the parents had mild attacks; the children (9 months to 5 years) confluent, three dying. The children were unvaccinated. None of these cases was removed to hospital.

House 246.—In the East End Road, a street to the north of the Great Western Railway, and surrounded by fields; there had been two houses in this street previously invaded. This house contained seven inmates, all of whom were vaccinated; six were attacked with small-pox, the worst case only being removed to hospital.

House 272.—In this house each of the 12 inmates was attacked, all remaining at home. The father (aged 53), vaccinated, died; as also did an unvaccinated infant and a girl of 17, whose "vaccination never took," although attempted three times (No. 590). Another daughter (No. 587) showed no marks of vaccination on her arm, and hers was the only other confluent attack in the household. Two young children (3 and 2 years) who were vaccinated at and just before their illness had mild attacks.

The houses invaded during this fortnight were situated in:—

1. Kingsholm - - -	2 houses,	7 cases.
2. St. Nicholas - - -	3 ,,	6 ,,
3. South Hamlet - - -	111 ,,	241 ,,
4. St. John Baptist - - -	2 ,,	3 ,,
	118	257

LIST OF HOUSES KNOWN TO BE INVADED BY SMALL-POX during the Fortnight ending March 14th, 1896.

[MAP 6.]

No. in House List.	Address.	District.	Inmates.					Cases.				
			1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.	1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.
165	22, Llanthony Road -	III.	—	—	5	—	2	—	—	*225*, 226 *528*	—	—
166	23, Alvin Street -	IV.	—	—	1	2	1	—	—	—	227	—
167	1, Regent Street -	III.	—	—	1	2	1	—	—	—	228	—
168	2, New Street - -	III.	1	—	4	2	2	—	—	229	*446*	—
169	20, Pembroke Street	III.	—	—	1	1	3	—	—	—	233	—
170	51, Castle Street -	III.	—	1	3	—	2	—	*463*	237, 721, 758	—	*462*, 464

No. in House List.	Address.	District.	Inmates.					Cases.				
			1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.	1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.
171	Llanthony Cottages	III.	1	—	4	3	2	856	—	240	—	480
172	28, Robin Hood Street	III.	—	—	1	3	2	—	—	—	244, 472	—
173	75, Victoria Street	III.	—	—	3	1	2	—	—	248	—	—
174	14, Widden Street	III.	—	—	3	2	2	—	—	—	249	—
175	Clarence Villa, Seymour Road.	III.	—	—	4	—	2	—	—	250	—	—
176	33, Melbourn Street	III.	—	—	3	4	2	—	—	—	251	—
177	Clare Terrace, Clegran Road.	III.	—	—	1	1	1	—	—	—	547	252
178	23, Dineley Street	III.	—	—	3	2	2	—	—	—	—	*253*
179	35, Upton Street	III.	—	—	4	1	1	—	—	—	—	254
180	56, Adelaide Street	III.	—	—	—	—	—	—	—	—	*264*	—
181	28, Clifton Road	III.	—	1	2	2	2	—	*1,169*	269, 553	—	—
182	16, Castle Street	III.	—	1	3	6	2	—	*715*	570, 700, *828*	270, 571	—
183	30, New Street	III.	—	—	—	—	—	—	—	—	271	—
184	7, Sydenham Terrace	III.	—	—	4	3	2	—	—	448	—	*272*
185	11, Wellington Street	III.	—	—	—	—	—	—	—	—	—	*275*
186	23, Linden Road	III.	—	2	1	2	—	—	*276*	—	633	—
187	21, New Street	III.	—	—	—	1	1	—	—	—	277	634
188	9, Pembroke Street	III.	—	—	—	8	2	—	—	—	279	—
189	41, Alma Place	III.	—	1	3	1	—	—	*280*	*511*, 513, *515*	*512*	—
190	9, Falkner Street	III.	—	—	—	2	3	—	—	—	—	281
191	34, Morton Street	III.	—	—	1	3	2	—	—	—	282	—
192	28, Morton Street	III.	—	—	—	4	—	—	—	—	285, 1,126, 1,525, 1,539	—
193	100, Falkner Street	III.	—	—	—	2	—	—	—	—	287	—
194	13, Morton Street	III.	—	—	5	3	2	—	—	*288*, *537*, *538*, *539*, *669*	540, 541, 585	542
195	19, Philip Street	III.	—	1	5	2	2	—	—	624, *665*, 666	289, 534	—
196	11, Vauxhall Road	III.	—	—	—	—	4	—	—	—	—	290
197	Farnbrook Terrace, Bates Lane.	I.	—	—	—	—	—	—	—	—	292	—
198	16, Millbrook Street	III.	—	1	4	—	2	—	—	293	—	—
199	63, Howard Street	III.	—	—	2	2	4	—	—	—	—	294
200	36, Conduit Street	III.	—	—	—	—	—	—	—	—	295	—
201	Cricklade Terrace, Hanman's Road.	III.	—	—	—	3	1	—	—	—	296	—
202	6, Morningside, Linden Road.	III.	—	—	5	1	2	—	—	—	—	297
203	3, St. Paul's Road	III.	—	1	3	—	2	—	695	—	—	298
204	24, Regent Street	III.	—	—	1	7	3	—	—	—	—	299
205	P. O. Bristol Road	III.	—	—	—	—	—	—	—	—	—	300
206	5, Morpeth Street	III.	—	—	—	—	—	—	—	—	—	302
207	High Orchard Street	III.	—	—	—	—	—	—	—	304, 328	329	—
208	15, Tredworth Road	III.	—	—	—	—	—	—	—	*305*	—	620
209	Winifred Villas, Melbourn Road.	III.	—	—	4	—	1	—	—	306, 307	—	—
210	10, Exhibition Street	III.	—	—	2	3	2	—	—	—	*308*	—
211	30, Castle Street	III.	—	—	—	—	—	—	—	—	—	309
212	54, Vauxhall Road	III.	—	—	—	3	2	—	—	—	—	*311*
213	1, Carmarthen Street	III.	—	—	3	2	—	—	—	*428*	312	
214	13, Upton Street	III.	—	—	—	—	—	—	—	—	—	313
215	1, Magdala Terrace	III.	—	1	—	2	1	—	—	—	315, 619	—
216	3, Linden Terrace	III.	—	—	3	1	1	—	—	316, 648	—	—
217	"Ellesmere," Parkend Road.	III.	—	—	—	—	—	—	—	—	320	—
218	16, Morpeth Street	III.	—	—	—	3	2	—	—	—	326, 579, 580	—
219	35, Theresa Street	III.	—	—	—	—	—	—	—	—	331	—
220	41, Ryeroft Street	III.	—	—	3	2	2	—	—	*1,013*, 1,195	898	332
221	48, Alma Place	III.	—	—	6	1	1	—	—	*860*	333	861
222	3, Alfred Street	III.	—	—	—	1	2	—	—	—	*334*	—
223	65, Blenheim Road	III.	—	—	—	2	1	—	—	—	336, 992	—
224	30, Morpeth Street	III.	—	—	2	—	3	—	—	—	—	337
225	3, Seymour Road	III.	—	—	2	2	—	—	—	706	338, *707*	—
226	11, Stratton Road	III.	—	—	—	1	2	—	—	—	342	—
227	72, Alma Place	III.	—	—	—	—	—	—	—	—	—	343
228	88, Alma Place	III.	—	—	2	2	—	—	—	—	344	—
229	61, Bristol Road	III.	—	—	—	1	4	—	—	—	—	*345*, 699
230	20, Brook Street	III	—	—	—	3	2	—	—	—	347	—
231	55, Barton Terrace	III.	—	—	1	3	2	—	—	—	—	348
232	68, Robin Hood Street	III.	—	1	1	3	—	—	*607*	—	349	—
233	3, Castle Street	III.	—	—	—	1	2	—	—	—	350	—
234	Elm Villa, Falkner Street.	III.	—	—	—	1	4	—	—	—	—	356
235	20, Cecil Road	III.	—	—	1	2	1	—	—	*357*	638	637
236	1, Vauxhall Road	III.	—	—	—	—	—	—	—	358	—	—
237	9, Forest Terrace	III.	—	—	1	—	2	—	—	359	—	729, 786
238	3, Morningside, Linden Road.	III.	—	—	3	1	1	—	—	—	—	360
239	10, Matson Place	III.	—	1	—	2	2	—	*802*	—	361, 725	727

No. in House List.	Address.	District.	Inmates.					Cases.				
			1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.	1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.
240	Stephens Court, Westgate.	II.	—	—	—	—	—	—	—	603, *703*	—	362
241	1, Theresa Street -	III.	—	—	2	3	—	—	—	*1,656*	*363*	—
242	20, Philip Street -	III.	—	—	3	1	1	—	—	*366*	662	—
243	26, Robin Hood Street	III.	—	—	—	2	1	—	—	—	690	367
244	10, Melbourn Street	III.	—	1	4	—	2	—	368	*524, 525 526, 527*	—	530, 701
245	128, High Street -	III.	—	—	—	1	2	—	—	—	370	—
246	39, East End Road -	I.	—	—	—	4	3	—	—	—	369, 600, 628, 631	629, 741
247	165, Lower Barton Street.	III.	—	—	—	4	1	—	—	—	371	—
248	14, Robin Hood Street	III.	—	1	2	—	2	—	—	780	—	372
249	2, Magdala Terrace -	III.	—	—	2	2	1	—	—	—	373	1,929
250	4, Raglan Street -	III.	—	—	1	2	—	—	—	*1,130*	374, 803	—
251	39, Alma Place -	III.	—	1	3	3	2	—	1,190	862, 1,189, *1,329*	818, 1,246	375, 824
252	34, Hopewell Street -	III.	—	—	2	—	3	—	—	*376*, 697	—	605, 708
253	12, Sunningdale Terrace, Linden Road.	III.	—	1	3	—	2	—	670	—	—	377
254	Hillview Terrace, Cecil Road.	III.	—	—	—	—	—	—	—	—	—	379
255	10, Morpeth Street -	III.	—	—	1	2	2	—	—	—	—	381
256	29, Robin Hood Street	III.	1	—	3	2	2	*383*	—	—	—	398
257	17, Robin Hood Street	III.	—	—	2	—	2	—	—	—	—	385, 1,455
258	12, Philip Street -	III.	—	—	4	2	2	—	—	—	—	387
260	111, New Street -	III.	—	—	—	—	4	—	—	—	—	389, *768*
261	62, Salisbury Road -	III.	—	—	—	—	—	—	—	—	391	—
262	56, Sebert Street -	II.	—	—	—	2	—	—	—	—	392	—
263	24, Alvin Street -	IV.	—	—	—	—	—	—	—	—	393, 535	—
264	15, Cecil Road -	III.	—	—	—	—	2	—	—	—	—	394
265	52, Alma Place -	III.	—	—	2	2	2	—	—	*717, 823*	395, 822	720
266	Woodbine Cottage, Linden Road.	III.	—	—	3	1	1	—	—	396, 718, 719	716	—
267	53, Castle Street -	III.	—	—	—	—	2	—	—	—	—	*397*
268	30, Philip Street -	III.	—	—	—	4	1	—	—	—	399, 402	—
269	47, Hopewell Street -	III.	—	—	5	—	3	—	—	—	—	404, 667
270	8, Conduit Street -	III.	—	—	—	1	2	—	—	—	406	—
271	46, Wellesley Street	III.	—	—	4	—	2	—	—	407	—	686
272	22, St. James' Street	III.	—	1	2	4	5	—	*610*	635, 636	587, *590*, 609, 632	*408*, 586, 687, 709, 726
273	41, Ducie Street -	III.	—	—	4	1	2	—	—	—	—	409
274	68, Brook Street -	III.	—	—	—	5	—	—	—	—	410, 754	—
275	51, New Street -	III.	—	—	3	2	1	—	—	411, 543, 793	—	—
276	102, Alma Place -	III.	—	—	1	6	2	—	—	1,607	412, 671, 1,127	1,253
277	Sidney Villa, Widden Street.	III.	—	—	3	2	—	—	—	—	416	—
278	Clegram Villas -	III.	—	—	—	4	2	—	—	—	*417*	—
279	14, Philip Street -	III.	—	—	—	2	2	—	—	—	—	418
280	2, Tredworth Road -	III.	—	—	—	3	4	—	—	—	419, 750	652, 661, 749
281	12, Albert Street -	III.	—	—	2	2	1	—	—	734, 799	420, 674	—
282	Prospect House Conduit Street.	III.	—	1	5	5	2	—	—	—	427	—
283	23, Lower Westgate Street.	II.	—	—	—	—	—	—	—	476	—	431

The *age*-incidence of the cases occurring in these houses was :—

1 month and under -	-	2 cases,	1 death.
1 month to 1 year -	-	12 „	8 „
1 to 10 years -	-	73 „	28 „
10 to 30 years -	-	96 „	9 „
30 and over -	-	74 „	9 „
		257	55

Thus the age-incidence shows a tendency to shift towards the adult period of life, but there is still a large preponderance of fatal cases amongst young children.

Of these 257 cases there were removed to hospital 94, of whom 24 died.

Remained at home 163, of whom 31 died.

VII.

March 15th to March 28th.—The disease continued to spread during this fortnight, there being 307 fresh cases, and 138 houses newly invaded. In these houses there occurred altogether 300 cases of small-pox, of which 72 were fatal:—

73	houses	yielded	1	case.
24	„	„	2	„
12	„	„	3	„
11	„	„	4	„
11	„	„	5	„
5	„	„	6	„
2	„	„	7	„

House 303.—Here there was a family of 12; 4 of the children (unvaccinated), aged from 5 to 8, having confluent attacks, 2 of which were fatal. These cases were left at home, but there was no further infection. The remaining 8 members had been vaccinated in infancy.

House 307.—Here all (5) were attacked, and all but 1 removed to hospital; 2 were unvaccinated, the rest vaccinated.

House 316.—All attacked, and all left at home; 3 died, 2 unvaccinated, at 4 and 8 and an infant 3 months old, vaccinated 5 days before onset of symptoms. The parents and the remaining child attacked were vaccinated in infancy.

House 332.—All the children, 5 in number attacked, ages from 7 to 12 years; they were unvaccinated, and their attacks were severe, 1 fatal (aged 11).

House 337.—All the children (4) attacked, 2 dying; 3 of them, including 1 of the fatal cases, had been vaccinated at the time of their illness.

House 356.—A family of 8 in a small house; 4 unvaccinated children (8, 5, 3, and 14 months) attacked, one dying (aged 3); another child, aged 14, had a mild attack, he had been vaccinated in infancy, as also had the mother, who died from malignant small-pox. These cases were left at home, but two of the family (vaccinated) escaped.

I may state here that it was a common practice for some of the wage-earners of a family to leave the house when small-pox appeared in it, and the cases had to be left at home. My impression that a larger number of the mothers were attacked than of fathers may thus be accounted for.

House 358.—A family of 8, 5 of whom attacked. At the time of the first case occurring the hitherto unvaccinated children were vaccinated, but 3 out of the 4 sickened within a few days; 2 of them died. These cases were all removed to hospital.

House 395.—Five in family, all attacked, 4 being unvaccinated children under 10 years of age, of whom 2 died.

House 391.—Six cases out of 7 in family (inclusive of an infant born during its mother's illness). Both parents (vaccinated) died as well as this infant; but 3 children (aged 2 to 5), who were vaccinated a week before the arrest of symptoms, had discrete and mild attacks.

These (138) houses were thus distributed in the districts:—

1. Kingsholm	4 houses,	7 cases.
3. South Hamlet	130 „	287 „
4. St. John the Baptist	4 „	6 „

The *age*-incidence of those attacked in these houses was:—

1 month and under	7 cases,	7 deaths.
1 „ to 1 year	9 „	6 „
1 to 10 years	108 „	36 „
10 to 30 years	98 „	11 „
30 and over	78 „	12 „
	300	72

Of these cases there were removed to hospital 66, of whom 17 died.
Remained at home 234, of whom 55 died.

List of Houses known to be invaded by Small-Pox during the Fortnight ending March 28th, 1896.

[Map 7.]

No. in House List.	Address.	District.	Inmates.					Cases.				
			1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.	1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.
284	Hanman's Terrace, Parkend Road.	III.	—	—	—	—	—	—	—	—	—	432
285	13, Sydenham Terrace.	III.	—	—	—	3	2	—	—	—	—	433, *915*
286	34, Alma Place	III.	—	1	—	2	—	—	—	—	434, 857	—
287	61, Napier Street	III.	—	—	2	1	1	—	—	*435*	—	—
288	34, Sinope Street	III.	—	1	—	1	1	—	*1,050*	—	436	—
289	48, Nelson Street	III.	—	1	3	2	2	—	*929*	891, 895, *897.*	438, 896	—
290	Thornmead Villa, Seymour Road.	III.	—	—	—	2	2	—	—	—	441	—
291	60, Victoria Street	III.	—	—	—	2	1	—	—	—	443, 765	—
292	12, Rycroft Street	III.	—	—	—	—	2	—	—	—	—	442
293	11, Clifton Road	III.	—	—	1	3	1	—	—	*731*	444	728
294	21, Sinope Street	III.	—	—	1	5	1	—	—	445	714, 759, 1,251.	—
295	"Northernhay," St. Paul's Road.	III.	—	—	2	3	2	—	—	—	447	1,233
296	5, Castle Street	III.	—	—	—	2	2	—	—	—	—	449, 804
297	41, Theresa Street	III.	1	—	4	1	1	*955*	—	450, 916	*752*	—
298	7, Union Street	IV.	—	—	—	—	—	—	—	—	453, *782*	—
299	25, New Street	III.	—	—	3	—	1	—	—	455, 456, 457.	—	454
300	98, New Street	III.	—	—	—	—	—	—	—	—	—	458
301	24, Wellesley Street	III.	—	1	2	1	2	—	*777*	*459*, 776	—	738, 796
302	5, New Street	III.	—	—	—	—	2	—	—	—	—	460
303	58, Stratton Road	III.	—	—	5	5	2	—	—	461, *880*, *881*, 932.	—	—
304	2, Knowles Road	III.	—	—	3	1	2	—	—	*654*	710	465
305	38, Howard Street	III.	—	—	2	—	2	—	—	467	—	—
306	19, Sydenham Terrace.	III.	—	—	—	—	2	—	—	—	—	*468*
307	25, India Road	III.	—	—	1	3	1	—	—	1,002	469, 751, 852.	913
308	Grove Villa, Seymour Road.	III.	—	—	—	—	—	—	—	*470*	—	—
309	42, Wellington Street	III.	—	—	—	1	2	—	—	—	—	471
310	13, Stratton Road	III.	—	—	3	4	2	—	—	—	473	—
311	Lorraine Villa, Weston Road.	III.	—	—	2	2	1	—	—	—	474	—
312	15, St. Paul's Road	III.	—	—	—	2	2	—	—	—	—	475
313	26, Morton Street	III.	1	—	3	3	2	*676*	—	*477*, 1,193	1,519	—
314	11, Nelson Street	III.	—	—	4	—	2	—	—	482	—	—
315	2, Castle Street	III.	—	—	—	—	2	—	—	—	—	483
316	17, Castle Street	III.	—	1	2	1	2	—	*829*	*484*, *642*	830	649, 650
317	18, Barton Terrace	III.	—	—	—	2	—	—	—	—	485, 735	—
318	48, Widden Street	III.	—	—	6	—	2	—	—	486, 851	—	848, 850
319	65, Regent Street	III.	—	—	1	3	3	—	—	487	—	—
320	4, Daventry Terrace	III.	—	1	—	2	—	—	996	—	488, 997	—
321	2, Hanman's Road	III.	—	1	5	3	2	—	—	489	—	—
322	62, Eastend Road	III.	—	—	2	3	2	—	—	744, 321	—	490
323	49, Hopewell Street	III.	—	—	—	—	—	—	—	*491*	—	—
324	19, Victory Road	III.	—	—	4	—	3	—	—	495, *894*, 1,123.	—	892, 893
325	26, Theresa Street	III.	—	—	—	3	—	—	—	—	496, 497	—
326	42, Philip Street	III.	—	—	—	—	—	—	—	—	500	—
327	27, New Street	III.	—	—	1	—	2	—	—	*502*	—	—
328	9, Melbourn Street	III.	—	—	2	2	—	—	—	—	503	—
329	81, Regent Street	III.	—	—	2	4	1	—	—	—	504	—
330	6, Napier Street	III.	—	—	—	3	1	—	—	—	*505*	—
331	Painswick Road, Crossing Cottage.	III.	—	—	2	1	2	—	—	*506*	—	—
332	22, Carmarthen Street	III.	—	—	2	3	2	—	—	760, 900	507, *901*, 902.	—
333	36, Adelaide Street	III.	—	—	1	—	2	—	—	508	—	—
335	20, Morpeth Street	III.	—	—	1	3	1	—	—	*516*	—	—
336	17, Weston Road	III.	—	—	—	2	2	—	—	—	517	—
337	10, Dainty Street	III.	—	1	3	—	1	—	1,089	*518*, *868*, 871.	—	—
338	7, New Street	III.	—	1	1	4	—	—	1,367	1,498	520, 835, 1,368.	—
339	26, Vauxhall Road	III.	—	—	—	—	2	—	—	—	—	521
340	Fowey Villa, Conduit Street.	III.	—	—	—	—	—	—	—	—	522	—
341	31, St. Paul's Road	III.	—	—	2	6	2	—	—	—	523, 1,014, 1,078.	—
342	51, Tredworth Road	III.	—	—	1	3	1	—	—	529	1,369	*842*
343	23, St. Mark's Street	IV.	—	—	—	—	2	—	—	—	—	531

No. in House List.	Address.	District.	Inmates.					Cases.				
			1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.	1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.
344	5, Vauxhall Road -	III.	—	—	—	1	2	—	—	—	—	532, 987
345	16, New Street -	III.	—	—	4	1	2	—	—	*533*	—	—
347	106, Southgate Street	III.	—	—	1	4	—	—	—	—	*544*	—
348	Seymour Road -	III.	—	—	—	2	1	—	—	—	546	—
349	7, Archibald Street -	III.	—	—	—	1	1	—	—	—	903	545
350	29, Sinope Street -	III.	—	—	1	4	1	—	—	—	548	—
351	40, Bristol Road -	III.	—	—	—	—	—	*550*	—	—	549	—
352	2, Wellesley Street -	III.	—	—	1	4	2	—	—	—	—	551
353	Llanthony Road -	III.	—	—	—	6	2	—	—	—	552	—
354	37, Melbourn Street	III.	—	—	—	—	—	—	—	—	—	554
355	110, Lower Barton Street.	III.	—	—	—	—	—	—	—	—	—	558
356	7, Alma Terrace -	III.	—	—	4	2	2	—	—	*559*, 561, 563, 819.	588	*621*
357	27, Melbourn Street	III.	—	—	2	1	2	—	—	883	—	560, 1,540
358	10, Jersey Road -	III.	—	—	5	2	1	—	—	562, *815*, *837*, 884.	906	—
359	1, Victoria Cottages, Barton Street.	III.	—	—	—	—	—	—	—	564, 863	—	—
360	44, Tredworth Road	III.	—	—	—	1	2	—	—	—	565	797
361	75A, Falkner Street	III.	—	—	—	2	1	—	—	—	566	1,065
362	65, Howard Street -	III.	—	—	1	1	2	—	—	—	*568*	966, *1,342*
363	11, Sydenham Terrace.	III.	—	—	—	4	2	—	—	—	569	—
364	11, Grove Street -	III.	—	—	4	—	2	—	—	1,765	—	572
365	8, Milbrook Street -	III.	—	—	—	—	2	—	—	—	—	573
366	12, New Street -	III.	—	—	4	4	—	—	—	*574*	958	—
368	113, Rycroft Street -	III.	—	—	—	—	—	—	—	—	—	577
369	21, Tredworth Road	III.	1	—	4	1	2	*1,080*	—	578	882	1,079
370	16, Melbourn Street	III.	—	1	1	2	—	—	*914*	—	581	—
371	54, Moor Street -	III.	—	—	1	2	2	—	—	—	677, 733	1,249
372	Falcon Villa, Jersey Road.	III.	—	—	—	3	1	—	—	—	589	—
373	Cricklade Terrace, Hanman's Road.	III.	—	—	—	7	1	—	—	—	593	—
374	1, Paul Street -	III.	—	1	2	2	—	—	—	*592*	—	—
375	57, Worcester Street	IV.	—	—	—	1	3	—	—	—	—	594
376	43, Stroud Road -	III.	—	—	3	3	1	—	—	596	595	911
377	47, Blenheim Road -	III.	—	—	—	2	—	—	—	—	597	—
378	226, Lower Barton Street.	III.	—	—	—	1	1		—	—	598	—
379	3, Dineley Street -	III.	—	—	—	—	—	—	—	—	—	*599*
380	6, Castle Street -	III.	—	—	1	2	2	—	—	601	—	—
381	19, Archibald Street	III.	—	—	—	2	2	—	—	—	—	602
382	4, Napier Street -	III.	—	—	1	2	2	—	—	*604*	—	—
383	38, Vauxhall Road -	III.	—	—	1	1	1	—	—	*606*	—	—
384	22, Alfred Street -	III.	—	—	1	2	1	—	—	—	—	608
385	37, Derby Road -	III.	—	—	—	5	2	—	—	—	611	—
386	19, Grove Street -	III.	—	—	—	—	2	—	—	—	—	612, 613
387	26, St. James' Street	III.	—	—	2	1	2	—	—	—	—	614
388	86, Milbrook Street -	I.	—	—	2	5	3	—	—	—	615	—
389	5, Forest Terrace -	III.	—	—	3	2	2	—	—	618, 867, 963.	616, 965	964
390	4, Stroud Road -	III.	—	—	—	2	1	—	—	—	617	—
391	50, Robin Hood Street.	III.	1	—	3	1	2	*623*	—	952, 1,009, 1,010.	*622*	*951*
392	2, Lady-bellgate -	IV.	—	—	3	2	3	—	—	625	—	—
393	36, Rycroft Street -	III.	—	—	2	1	2	—	—	1,958	—	626
394	35, Sidney Street -	I.	—	—	—	1	2	—	—	—	—	627, 973
395	37, Victory Road -	III.	—	—	4	1	—	—	—	*630*, *655*, 657, 659.	660	—
396	54A, Moor Street -	III.	—	—	—	—	—	—	—	—	639	—
397	58, Castle Street -	III.	—	—	3	2	2	—	—	640, *736*, 833.	641, 832	—
398	4, Alfred Street -	III.	—	—	—	1	1	—	—	—	645	—
399	Mace's Buildings, Cecil Road.	III.	—	—	—	—	2	—	—	—	—	*646*
400	7, Baker Street -	III.	—	—	3	6	1	—	—	1,173, 1,515 1,516.	651, 1,174, 1,285, 1,517	—
401	26, New Street -	III.	—	—	2	3	—	—	—	722, 724	653, 678, 723.	—
402	54, Robin Hood Street.	III.	—	—	4	3	2	—	—	—	—	658
403	15, Rycroft Street -	III.	—	—	4	1	2	—	—	*664*	*663*	—
405	42, Melbourn Street	III.	—	—	3	1	2	—	—	1,117, 668	—	1,110, 1,326
406	9, Vauxhall Road -	III.	—	—	—	1	3	—	—	—	—	675
407	41, Barton Terrace -	III.	1	—	2	2	3	*826*	—	794, *1,269*	*679*	1,315
408	25, Melbourn Street	III.	—	—	1	—	2	—	—	*681*	—	—
409	24, Carmarthen Street	III.	1	—	4	2	2	*1,331*	—	683, 1,184, 1,185, 1,270	692, 1,111	—
410	41, Morton Street -	III.	—	—	1	1	3	—	—	*684*	—	1,145, 1,266
411	41, Stroud Road -	III.	—	1	6	3	2	—	*689*	685	—	—
412	29, Victoria Street -	III.	—	—	—	2	2	—	—	—	682	688, 1,069
413	132, Lower Barton Street.	III.	—	—	2	7	2	—	—	—	691	—

No. in House List.	Address.	District.	Inmates.					Cases.				
			1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.	1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.
414	35, Magdala Road -	III.	—	—	—	1	1	—	—	—	—	696
416	43, Ducie Street -	III.	—	—	3	2	1	—	—	702	—	—
417	30, India Road -	III.	—	—	3	3	1	—	—	*704*, 1,003, *1,372*	*1,138*	—
418	12, Llandilo Street -	III.	—	—	—	—	—	—	—	—	705	—
419	18, Birchmore Road	I.	—	—	2	—	2	—	—	—	—	*711*
420	1, Victory Road -	III.	—	—	4	1	2	—	—	712, 1,053, 1,159.	—	*1,131*, 1,524
421	16, Alford Street -	III.	—	—	2	1	1	—	—	—	—	713
422	86, New Street -	III.	—	—	1	3	2	—	—	—	730	—
423	39, Nelson Street -	III.	—	—	—	—	—	—	—	—	—	*732*
424	1, Wellesley Street -	III.	—	—	—	2	3	—	—	—	*739*	—
425	26, Hanman's Road -	III.	—	—	2	3	2	—	—	*740*	1,235, 1,332	1,178
426	2, Alma Terrace -	III.	—	—	1	1	2	—	—	1,240	—	*742*

VIII.

March 29th to April 11th.—During this fortnight the height of the epidemic was reached. The notifications amounted to from 40 to 50 per diem, and the main bulk of these cases were perforce obliged to be retained in their homes, whilst not a few persons had recourse to empirical remedies that were being widely advertised as panaceas for small-pox. The hospital in Stroud Road had been extended and new wards were approaching completion, whilst steps were being taken to place the superintendence of the building in the hands of a medical man experienced in small-pox hospital management.

During this fortnight 404 fresh cases became known to the authorities, and 224 houses were newly invaded. There occurred in these houses, now and subsequently, 385 cases, of which 83 were fatal :—

134	houses	yielded	1 case.
52	„	„	2 „
23	„	„	3 „
5	„	„	4 „
4	„	„	5 „
4	„	„	6 „
2	„	„	7 „

The proportion of houses with single cases, 134, to those with multiple cases, 90, shows a distinct improvement, and seems to suggest either a diminution in infectivity or in receptivity to the poison. For the conditions favouring the spread within households were as favourable as ever, indeed more favourable than in the early weeks of the year, when hospital isolation was being promptly practised. I again select a few instances of exceptional interest.

House 432.—Every member of this family (6) was here attacked, and all the cases were left at home. The first to fall ill was the mother (aged 38), vaccinated, all the others being attacked a fortnight later. The father was vaccinated, and he and his wife had discute attacks. All the children were unvaccinated, one, a girl of 19, who was attempted unsuccessfully to be vaccinated two months previously ; her attack was not a severe one, but the 3 younger children suffered severely, 2 (aged 6 months and 6 years) dying.

House 434.—A family of 7; the parents (vaccinated) escaped. Three vaccinated children (aged 7, 9, and 12) were attacked, 2 slightly, 1, the youngest (W. H.), severely. This boy had 4 large foveate vaccination scars, and his is, I think, the most severe case I have seen in a vaccinated child of his age. I saw him some weeks later, and observed that his face was deeply pitted. The only 2 unvaccinated children in this family (aged 3 and 5) died. The father remained away from home during the weeks that small-pox was in the house, for the children were nursed at home by their mother.

House 444.—Here the only unvaccinated member of the family (a child of 7) escaped ; another child, over 5, vaccinated 5 days before sickening, died, as also did

a girl of 14; she had 4 vaccination cicatrices, and died of malignant small-pox. The 4 other cases in this family were mild attacks.

House 473.—Two unvaccinated children attacked, 1 died, whilst 4 others, also unvaccinated, escaped. Both the cases were sent to hospital.

House 498.—Eight in family, 7 attacked and kept at home; 3 of them died, viz., the mother (aged 38), who was unvaccinated, and 2 unvaccinated children (4 and 8 years). Another unvaccinated child (aged 6) had confluent small-pox, as did 1 of the 2 vaccinated ones who were attacked (aged 16). The other case was a mild one, as also was that of the father, who, in nursing his children, became inoculated with small-pox.

House 499.—There were 6 in this family, 2 escaped, 1 of them an unvaccinated child under 10 years. But all the rest died of small-pox including the father (vaccinated), 30 years of age, and children (unvaccinated) from 2 to 6 years old.

House 502.—Every member of this family suffered, including the mother (who was unvaccinated), father (vaccinated), and 3 unvaccinated children, of whom 1 died.

House 519.—Here 4 children (unvaccinated) under 10 years were attacked, and 2 died, out of a family of 7. They were all nursed at home.

House 560.—There were 12 inmates of this house; 2 vaccinated adults were attacked, 1 removed to hospital; 5 unvaccinated children had confluent attacks, and 3 of them died. The remaining 5 (4 children and 1 adult), all vaccinated, escaped infection.

House 565.—In this family, of which the youngest member was 15 years old, all but 2 were attacked, the first to fall ill being the father, 67 years of age, then 5 others, at ages ranging from 15 to 24. All had been vaccinated in infancy. These cases were all kept at home.

House 584.—Four attacked, ages from 13 to 32; all vaccinated; all kept at home; 2 adults escaped infection.

House 603.—A mild case in a vaccinated young woman (domestic); no other case; but of the remaining 8 members of the household, 4 children had not been vaccinated. They were all over 10 years of age.

These infected houses (224) were distributed in :—

1. Kingsholm	12, with	15 cases.
2. St. Nicholas	8 „	8 „
3. South Hamlet	187 „	341 „
4. St. John Baptist	17 „	21 „

The *age*-incidence of those attacked in these houses was :—

1 month and under	2 cases,	2 deaths.
1 month to 1 year	12 „	6 „
1 to 10 years	102 „	33 „
10 to 30 years	152 „	15 „
30 and over	117 „	27 „
	385	83

Of these 385 cases there were removed to hospital 93, of whom 26 died.
Remained at home 292, of whom 57 died.

List of Houses known to be Invaded by Small-Pox during the Fortnight ending April 11th, 1896.

[Map 8.]

No. in House List.	Address.	District.	Inmates.					Cases.				
			1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.	1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.
415	6, Ducie Street	III.	—	—	2	—	2	—	—	1,008	—	1,364
427	11, Morton Street	III.	—	—	2	3	2	—	—	—	1,194, 1,294	*743*
428	Windsor Villa, Stroud Road.	III.	—	—	—	4	2	—	—	—	745	*1,472*
429	71, Melbourn Street	III.	—	—	2	1	3	—	—	*746*, 1,252	—	1,146
430	25, Alma Place	III.	—	—	—	1	1	—	—	—	—	748
431	23, Ducie Street	III.	—	—	3	2	2	—	—	753	—	—
432	29, Nelson Street	III.	—	1	2	1	2	—	*1,105*	*1,103*, 1,104	1,102	755, 1,101
433	34, Wellesley Street	III.	—	—	—	—	4	—	—	—	—	756, 961
434	5, Alma Place	III.	—	—	4	1	2	—	—	1,143, 1,144	757	—
435	45, Castle Street	III.	—	1	3	2	2	—	—	*1,287, 1,288* —	—	761
436	"Anniville," Knowles Road.	III.	—	—	—	3	—	—	—	—	762, 763	—
437	56, Victoria Street	III.	—	—	—	1	2	—	—	—	1,148	764
438	1, Mill Street	III.	—	—	—	2	—	—	—	—	766	—
439	22, Victoria Street	III.	—	—	1	2	—	—	—	*1,408*	767	—
440	24, Tredworth Road	III.	—	—	—	2	3	—	—	—	—	769
441	2, India Road	III.	—	—	2	—	2	—	—	—	—	770, 1,376
442	12, St. James' Street	III.	—	—	—	1	1	—	—	—	772	—
443	53, Rycroft Street	III.	—	—	2	1	1	—	—	1,260, *1,261*	773	—
444	11, Wellesley Street	III.	—	—	2	4	2	—	—	*774*	917, *1,226*, 1,227.	536, 840
445	15, Hopewell Street	III.	—	—	1	1	2	—	—	—	775	—
446	23, Nelson Street	III.	—	—	2	—	2	—	—	778	—	—
447	18, Alfred Street	III.	—	—	5	2	2	—	—	—	779, 1,919	1,846
448	44, Sherborne Street	IV.	—	—	—	2	2	—	—	—	781	—
449	28, Cecil Road	III.	—	1	2	2	—	—	—	783	—	—
450	36, Wellesley Street	III.	—	—	2	2	2	—	—	—	1,358	784
451	68, London Road	I.	—	—	2	1	1	—	—	785, 1,325	1,098	—
452	12, Ducie Street	III.	—	1	2	4	2	—	792	787, 790	831	789
453	7, George's Row, Merton Street.	III.	—	—	2	2	—	—	—	—	788	—
454	1, Linden Terrace	III.	—	—	2	2	2	—	—	795, 798	—	—
455	6, Mill Street	III.	—	—	2	—	2	—	—	—	—	*800*
456	"Lyndhurst," Linden Road.	III.	—	—	2	3	2	—	—	—	801	—
457	105A, Barton Street	III.	—	—	1	1	2	—	—	805	—	—
458	5, Clarence Street	IV.	—	—	—	5	2	—	—	—	—	*806*
459	65, Brook Street	III.	—	—	—	1	2	—	—	—	807	—
460	4, West End Parade	II.	—	—	—	—	—	—	—	—	808	—
461	Lyppiat Villa, Derby Road.	I.	—	—	2	1	2	—	—	—	—	809
462	108, Melbourn Street	III.	—	—	—	4	1	—	—	—	810, 1,004	—
463	24, St. James' Street	III.	—	—	—	—	—	—	—	—	—	*811*
464	Blomfield Terrace, Linden Road.	III.	—	—	4	2	2	—	—	812, *813*, 1,175, 1,176	1,289, 1,290	—
465	3, Belgrave Terrace, Regent Street.	III.	—	—	—	—	—	—	—	—	813	—
466	26, Victory Road	III.	—	—	1	3	2	—	—	1,382	814, 1,581	1,271
467	14, Brook Street	III.	—	—	—	—	—	—	—	—	816	—
468	28, New Street	III.	—	—	2	3	2	—	—	821	1,434	—
469	8, Ducie Street	III.	—	—	1	1	2	—	—	—	825	—
470	7, Old Tram Road	III.	—	—	—	1	2	—	—	—	834	—
472	60, India Road	III.	—	—	3	1	1	—	—	838, 839	—	—
473	10, Nelson Street	III.	—	—	3	1	1	—	—	84[illegible]	*903*	—
474	56, Hopewell Street	III.	—	1	—	1	2	—	—	—	—	*844*
475	2, Daventry Terrace	III.	—	—	1	2	1	—	—	—	*845*	—
476	62, New Street	III.	—	1	2	2	1	—	*846*	—	—	1,032
477	8, St. James' Street	III.	—	1	—	—	3	—	—	—	—	847
478	Seymour Villa, Linden Road.	III.	—	—	2	1	1	—	—	—	849	—
479	Raglan Terrace, Southgate.	III.	—	—	—	6	3	—	—	—	—	853, 1,273
480	7, Windsor Place, Milbrook Street.	III.	—	1	—	2	—	—	854	—	1,312	—
481	54, Barton Street	III.	—	—	—	—	—	—	—	—	855, 1,456	—
482	40, Alma Place	III.	—	—	—	2	—	—	—	—	858, 859	—
483	33, Nelson Street	III.	—	—	2	5	2	—	—	864	—	—
484	11, Stroud Road	III.	—	—	2	5	1	—	—	865	—	—
485	6, Robin Hood Street	III.	—	1	4	2	2	—	—	870, 1,116	1,115	—
486	2, Clement Cottages	III.	—	—	1	2	1	—	—	—	866	—
487	108, Alfred Street	I.	—	—	—	3	—	—	—	—	869	—
488	15, Moor Street	III.	—	—	—	—	—	—	—	—	—	877
489	66, India Road	III.	—	—	—	2	—	—	—	—	872, 1,405	—
490	20, Albert Street	III.	—	1	2	1	2	—	—	875	—	—
491	9, Tredworth Road	III.	—	—	—	1	2	—	—	—	—	876
492	10, Rycroft Street	III.	—	—	1	3	2	—	—	878	—	—

No. in House List.	Address.	District.	Inmates.					Cases.				
			1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.	1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.
493	15, Wellington Street	III.	—	—	1	—	2	—	—	879	—	—
494	70, New Street -	III.	—	—	1	1	1	—	—	*1,484*	885	*1,753*
495	74, Barton Street -	III.	—	—	1	3	2	—	—	886	—	—
496	48, Wellesley Street	III.	—	—	—	1	2	—	—	—	887	1,322
497	9, Magdala Road -	III.	—	—	—	—	3	—	—	—	—	888
498	60, Regent Street -	III.	—	—	3	3	2	—	—	1,518, *1,751* *1,752.*	889, 388	1,421, *1678*
499	29, Wellesley Street	III.	—	—	4	1	1	—	—	*899, 959,* *960.*	—	*1,023*
500	12, St. Paul's Road -	III.	—	—	—	3	—	—	—	—	904	—
501	124, Melbourn Street	III.	—	1	2	1	2	—	890	—	—	—
502	6, Alma Terrace -	III.	—	—	3	1	1	—	—	982, *1,108,* 1,401.	1,109	909
503	Worcester Street -	IV.	—	—	4	—	3	—	—	—	—	*910*
504	1, King's Barton Street.	III.	—	—	3	2	2	—	—	—	908	—
505	"Black Dog," Northgate.	IV.	—	—	2	6	2	—	—	912	—	—
506	6, Alma Place -	III.	—	—	5	1	1	—	—	—	907	1,439
507	20, Archibald Street	III.	—	1	1	—	2	—	—	918	—	—
508	28, India Road -	III.	—	—	1	3	—	—	—	—	*919*	—
509	55, Linden Road -	III.	—	—	1	2	2	—	—	—	921	—
510	Hope Villa, Clegram Road.	III.	—	—	3	1	2	—	—	*1,566,* 1,780	922	—
511	6, Clegram Road -	III.	—	—	1	5	2	—	—	923	—	—
512	Eunice Villa, Seymour Road.	III.	—	—	—	3	2	—	—	—	—	924
513	Midland Crossing Cottage.	III.	—	—	2	2	2	—	—	*925,* 1,386	—	—
514	46, Derby Road -	III.	—	—	—	1	2	—	—	—	926	—
515	18, Napier Street -	III.	—	—	—	3	2	—	—	—	927	—
516	8, Victoria Street -	III.	—	—	5	—	2	—	—	928	—	—
517	23, Barton Terrace -	III.	—	—	4	1	1	—	—	—	929	—
518	115, Barton Street -	III.	—	—	3	2	2	—	—	930, *1,291*	—	—
519	4, Hopewell Street -	III.	—	1	3	1	2	—	*931*	1,393, *1,394* 1,432.	—	—
520	105, Howard Street -	III.	—	—	—	3	1	—	—	—	933	—
521	Barton Lawn - -	III.	—	—	—	1	4	—	—	—	—	934
522	66, Barton Street -	III.	—	—	—	—	—	—	—	—	935	—
523	28, Park Road -	III.	—	—	—	1	2	—	—	—	—	936
524	83, New Street -	III.	—	—	—	—	—	—	—	—	*937*	—
525	16, Bull Lane -	IV.	—	—	3	1	2	—	—	938	—	—
526	56, New Street -	III.	—	—	—	2	2	—	—	—	944	939
527	55, Robin Hood Street	III.	—	—	3	1	1	—	—	*1,223,* 1,587	940	—
528	44, Nelson Street -	III.	—	—	1	2	1	—	—	—	941	—
529	6, Twyver Street -	I.	—	—	—	1	1	—	—	—	942	—
530	— Hanman's Road -	III.	—	—	—	—	—	—	—	*943*	—	*1,357*
531	20, Tredworth Road	III.	—	—	—	—	—	—	—	—	945	—
532	1, High Orchard Street.	III.	—	—	—	—	—	—	—	—	*946*	—
533	5, St. Mark's Street -	IV.	—	—	—	2	2	—	—	—	947, *1,471*	—
534	16, Guinea Street -	II.	—	—	4	2	1	—	—	—	948	—
535	Goulder's Yard, Norfolk Street.	III.	—	1	4	—	2	—	—	949	—	1,426
536	Pridy's Passage, Longsmith Street.	IV.	—	—	—	2	1	—	—	—	950, 1,007	1,305
537	55, New Street -	III.	—	—	3	1	1	—	—	957, *1,328*	956	—
538	30, St. Paul's Road -	III.	—	1	1	3	1	—	—	—	967, 968, 1,301.	—
539	19, Tredworth Road	III.	—	—	1	2	1	—	—	—	962	—
540	64, New Street -	III.	—	—	3	1	3	—	—	—	969	—
541	56, St. Catherine Street.	II.	—	—	—	2	1	—	—	—	970	—
542	2, Henry Street -	IV.	—	—	—	1	3	—	—	—	972	—
543	16, Sebert Street -	II.	—	—	—	1	2	—	—	—	974	—
544	23A, Arthur Street -	III.	—	—	—	—	—	—	—	*975*	—	—
545	28, Weston Road -	III.	—	—	—	4	2	—	—	—	—	976
546	48, Derby Road -	I.	—	—	—	—	2	—	—	—	—	977
547	34, Morpeth Street -	III.	—	—	2	1	2	—	—	—	—	978, 1,310
548	18, Hopewell Street -	III.	—	1	—	2	1	—	1,468	—	1,292, 1,428	—
549	18, Cambridge Street	III.	—	—	—	1	2	—	—	—	—	980
550	39, Ryecroft Street -	III.	—	—	—	3	3	—	—	—	—	981
551	14, Hanman's Road -	III.	—	—	—	4	2	—	—	—	983	—
552	29, Millbrook Street	III.	—	1	1	1	1	—	*1,476*	984	—	—
553	12, Dainty Street -	III.	—	1	4	2	2	—	—	985	—	—
554	37, Salisbury Road -	III.	—	—	1	2	—	—	—	1,433	986, *1,534*	—
555	8, Alfred Street -	III.	—	1	—	2	—	—	—	—	988, 1,442	—
556	9, Albany Street -	III.	—	1	2	—	2	—	—	—	—	989
557	24, Morton Street -	III.	—	1	3	1	1	—	1,330	990	—	1,371
558	7, St. James' Street -	III.	—	—	—	—	—	—	—	*994*	—	—
559	20, Wellington Street	III.	—	—	3	—	3	—	—	—	—	995
560	10, Baker Street -	III.	—	1	5	3	3	—	*1,514*	*1,015, 1,076* 1,171, 1,513	—	998, 1,078
561	1A, Stratton Road -	III.	—	—	4	—	2	—	—	*999, 1,000*	—	—
562	Alexandra Road -	II.	—	—	—	2	3	—	—	—	—	1,001

No. in House List.	Address.	District.	Inmates.					Cases.				
			1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.	1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.
563	26, Twyver Street	I.	—	—	—	4	—	—	—	—	1,005	—
564	10, Portland Street	IV.	—	—	—	2	2	—	—	—	1,006	—
565	8, Alma Terrace	III.	—	—	—	6	2	—	—	—	1,012, 1,017 1,106, 1,107 1,762.	1,011
566	31, Theresa Street	III.	—	—	3	2	2	—	—	*1,016*, 1,409	1,491	—
567	82, Alma Place	III.	1	—	4	2	—	*1,019*	—	—	*1,018*	—
568	41, New Street	III.	—	—	1	1	2	—	—	1,020	—	—
569	19, Nelson Street	III.	—	—	4	1	2	—	—	*1,021*	—	*1,713*
570	2, Forest Terrace	III.	—	—	2	1	3	—	—	—	1,448	1,022 *1,477*
571	28, Clegram Road	III.	—	—	—	2	2	—	—	—	—	*1,024*
572	108, Alma Place	III.	1	—	1	5	2	*1,434*	—	—	—	1,025, 1,453
573	5, Old Tram Road	III.	—	—	—	—	2	—	—	—	—	1,026, *1,463*
574	64, Salisbury Road	III.	—	—	—	3	2	—	—	—	1,027	1,541
575	10, Alfred Street	I.	—	—	1	—	2	—	—	—	—	*1,028*
576	26, Barton Street	III.	—	—	—	1	2	—	—	—	—	1,029
577	Old Row, Milbrook Street.	III.	—	—	3	3	2	—	—	1,030	1,651	1,477
578	Elm Villa, Stroud Road.	III.	—	—	—	1	2	—	—	—	1,031	—
579	97, Barton Street	III.	—	—	—	2	2	—	—	—	1,033	—
580	76, New Street	III.	—	1	—	4	2	—	—	—	1,086	1,034
581	37, Robin Hood Street	III.	—	—	—	3	1	—	—	—	—	1,035
582	7, Blenheim Road	III.	—	—	—	5	2	—	—	—	1,036	—
583	34, Castle Street	III.	—	—	—	—	—	—	—	—	—	*1,037*
584	30, Victoria Street	III.	—	—	—	3	3	—	—	—	1,039, 1,469 1,710.	1,038
585	37, Stroud Road	III.	—	—	1	4	3	—	—	1,702	—	*1,040*, 1435
586	33, Rycroft Street	III.	—	—	2	2	2	—	—	1,399	—	*1,041*
587	60, Sweetbriar Street	IV.	1	—	1	3	—	—	—	—	1,042, 1,733	—
588	20, Robin Hood Street	III.	—	1	1	1	3	—	—	—	1,043	—
589	62, Regent Street	III.	—	—	1	—	2	—	—	—	—	1,044
590	2, Henry Place, Slaney Street.	III.	—	—	—	5	2	—	—	—	1,045	—
591	32, Cecil Road	III.	—	—	1	1	1	—	—	*1,198*	1,046	—
592	28, Wellesley Street	III.	—	—	4	3	1	—	—	—	1,047	—
593	"The Manse," Weston Road.	III.	—	—	1	4	3	—	—	—	—	*1,048*
594	Turk's Yard, Swan Lane.	IV.	—	—	—	1	1	—	—	—	1,049	—
595	8, Windmill Parade	I.	—	1	3	—	2	—	—	*1,051*	—	—
596	3, Lady-bellgate	IV.	—	—	—	2	—	—	—	—	*1,052*	—
597	29, Howard Street	III.	—	—	—	1	2	—	—	—	1,054	—
598	10, Castle Street	III.	—	—	2	4	2	—	—	—	—	1,055
599	51, Napier Street	III.	—	—	1	2	2	—	—	1,056	—	1,957
600	21, Worcester Parade	IV.	—	—	1	1	2	—	—	—	—	1,057
601	26, Wellesley Street	III.	—	—	—	2	2	—	—	—	—	*1,058*
602	90, Sherborne Street	IV.	1	—	4	3	3	—	—	*1,059*	—	—
603	3, Howard Street	III.	—	—	—	5	4	—	—	—	1,060	—
604	St. James' Crescent, Barton Street.	III.	—	1	—	2	—	—	—	—	1,061	—
605	112, Alma Place	III.	—	—	1	1	1	—	—	1,062	—	1,064
606	22, Wirrall Street	II.	—	—	1	5	2	—	—	1,063	—	—
607	126, Milbrook Street	I.	—	—	1	—	3	—	—	—	—	1,066
608	Cut Hill House, Stroud Road.	III.	—	—	1	2	2	—	—	1,097	*1,254*	1,067
609	23, Theresa Street	III.	—	—	—	—	—	—	—	—	1,068, 1,464	—
610	Grove Villa, Alfred Street.	I.	—	1	4	1	3	—	—	—	—	1,070
611	13, Conduit Street	III.	—	—	—	3	2	—	—	—	1,071	1,072
612	78, Alma Place	III.	—	—	1	2	1	—	—	1,522	1,073, 1,523	—
613	69, Bristol Road	III.	—	—	—	—	—	—	—	—	—	*1,074*
614	10, Victoria Street	III.	—	—	—	1	1	—	—	—	1,377	1,077
615	19, Regent Street	III.	—	—	—	3	2	—	—	—	—	1,081
616	34, St. James' Street	III.	—	—	1	4	2	—	—	—	1,096	1,649
617	Brisbane Cottage, Parliament Street.	IV.	—	—	1	—	2	—	—	—	—	1,082
618	Cavendish House, Clegram Road.	III.	—	1	2	2	1	—	—	—	1,083	—
619	15, Princes Street	III.	—	—	1	1	3	—	—	—	—	*1,084*
620	83, St. Catherine Street.	II.	—	—	—	5	2	—	—	—	*1,085*	—
621	106, New Street	III.	—	1	—	3	—	—	—	—	1,087	—
622	41, Princes Street	III.	—	—	—	—	3	—	—	—	—	*1,088*
623	22, Jersey Road	III.	—	—	1	4	2	—	—	—	1,090	—
624	4, Dynevor Street	III.	—	—	1	3	1	—	—	—	1,091	—
625	14, Knowles Road	III.	—	—	3	3	—	—	—	—	1,092	—
626	27, Dynevor Street	III.	—	—	—	—	2	—	—	—	—	1,093, 1,488
627	27, Union Street	IV.	—	—	1	5	2	—	—	—	1,095	—
628	56, Linden Road	III.	—	—	—	—	—	—	—	—	1,099	—
629	70, Suffolk Street	IV.	—	—	—	3	2	—	—	—	1,100	—
630	20, Carmarthen Street.	III.	—	—	3	—	2	—	—	—	—	1,112, 1,530
631	4, High Orchard Street.	III.	—	—	1	3	2	—	—	—	—	1,113

No. in House List.	Address.	District.	Inmates.					Cases.				
			1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.	1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.
632	45, Robin Hood Street	III.	—	1	3	2	1	—	1,446	1,114, 1,222 1,501.	1,500	—
633	28, Alma Place -	III.	—	1	2	6	2	—	*1,224*	—	*509*, 1,118	1,610
634	104, Alma Place -	III.	—	—	1	6	2	—	—	1,589	1,119, 1,889	—
635	61, Alma Place -	III.	—	1	3	2	2	—	—	—	—	1,120
636	8, Nelson Street -	III.	—	—	3	2	2	—	—	1,122	—	—
637	99, Falkner Street -	III.	—	—	3	4	2	—	—	—	—	1,124
638	39, Victoria Street -	III.	—	—	2	1	2	—	—	—	—	1,125
639	41, East End Road -	I.	—	—	1	2	—	—	—	—	*1,129*	—
640	10, Hopewell Street -	III.	—	—	—	—	2	—	—	—	—	1,131, 1,132
641	44, Clifton Terrace -	III.	—	—	—	2	3	—	—	—	1,133	1,134
642	43, Alma Place -	III.	—	—	—	2	—	—	—	—	1,135	—
643	Clare Street, St. Mary's Square.	II.	—	—	2	2	—	—	—	—	1,136	—
644	161, High Street -	III.	—	—	—	3	1	—	—	—	—	*1,137*
645	32, Widden Street -	III.	—	—	—	—	3	—	—	—	—	1,139, 1,577
646	35, Victory Road -	III.	—	—	1	2	1	—	—	—	1,140	1,192
647	12, Dynevor Street -	III.	—	—	—	1	2	—	—	—	—	1,141
648	The Spa - -	III.	—	—	—	2	2	—	—	—	—	1,147
898	19, Herbert Road -	I.	—	—	—	—	—	—	—	—	680	*1,593*
912	26, Clegrum Road -	III.	—	—	1	4	2	—	—	—	—	*771*

IX.

April 12th to April 25th.—The subsidence of the outbreak of small-pox did not at first proceed very rapidly. There were certainly fewer attacks, viz., 334 in this fortnight, as compared with 404 in the preceding, but there were 202 new invasions of houses, only 22 less than in that period.

It was at this time that there was introduced a new factor which, although claimed to check the disease, tended rather to defeat its own object, for, in not a few instances with which I am acquainted, it did directly disseminate it. I allude to the introduction into the city, through private enterprise, of the hydropathic system of treatment, mention of which cannot be avoided in the history of this epidemic. Quite apart from any question as to the intrinsic value of such treatment, which within due limits is well recognised, it must be admitted that the doctrines upon which its employment in acute specific diseases is sometimes based are lacking in any scientific support. I do not think I shall be misrepresenting these views by stating that, applied to small-pox, they are tantamount to a non-recognition of the risks of contagion. It is held that the system of tepid baths (with permanganate in them) adopted at the earliest appearance of symptoms of febrile illness can not only subdue the fever, but check the natural development of the disease, and also rob it of its infectivity. It was proclaimed almost in as many words, that the small-pox would speedily be banished from Gloucester by the adoption of this method of treatment, and I was myself assured by its director that all cases could be "cured" by it. It is not surprising that, under the circumstances of an epidemic disorder which had already been so striking in its ravages, the suggestions thus boldly advanced should have been received with acclamation by persons ignorant of the natural course of the malady, but it is somewhat astonishing that intelligent and thinking people could have been deceived thereby. At any rate, the system was soon established in the city, and a fund was raised to defray the cost of carrying it out. There were many enthusiastic supporters in the cause, which in so far as it inculcated cleanliness and ventilation of infected houses deserved recognition, and it may possibly have had some effect in diminishing the spread of contagion within the house itself. Application was made to the Sanitary Authority to grant the use of a place of worship in the Derby Road (of which the minister was the most prominent supporter of this system) as a hospital for the treatment, but naturally the establishment of an infected centre in that neighbourhood could not be sanctioned. The treatment was therefore carried on, under the supervision of its director, at the houses of the patients, a staff of young men and women, mostly connected with the religious community referred to, being employed in the capacity of nurses. Their devotion was, in many instances, rewarded by themselves being attacked with small-pox, and sometimes they conveyed the contagion to their own homes.

It is perhaps needless to add that, naturally, as time went on, cases of severe as well as mild type came under this treatment, and several deaths occurred, some

"uncertified," and buried by the coroner's order, others certified by a medical man called in towards the end of the case. But the dissemination of the disease, owing to this widespread adoption of house-to-house hydropathy, was not limited to those employed in carrying the system out. Many of the patients, who feeling well were allowed and indeed encouraged to go out, since they were told that they were free from infection, were about the streets in an infectious state. Again, several cases subjected to this treatment were either not notified to the authorities at all, or, if so, at a date much after that at which, had they been declared, precautions could have been insisted upon. I have no hesitation in saying that over and above the risk of diffusion due to so large a proportion of cases being retained in their homes (and the adoption of this treatment of necessity antagonised efforts to remove patients to hospital), this system, as carried out, was to some extent responsible for keeping up the epidemic throughout the following weeks.

In the 202 houses newly invaded during this fortnight, 297 cases occurred, of which 55 were fatal, a distinct diminution in fatality, which may be due to fewer children being attacked, and to the greater proportion of mild cases.

141	houses	yielded each	1 case.
39	,,	,,	2 ,,
17	,,	,,	3 ,,
2	,,	,,	4 ,,
2	,,	,,	5 ,,
1	,,	,,	9 ,,

House 678.—Of 12 inmates of this house, nine were attacked with small-pox, four of whom died. Two of the cases were removed to hospital, viz., the first and the last to be attacked (on April 15th and June 13th respectively). Of those attacked five were children (1 to 6 years) unvaccinated, of whom three died; three were between 13 and 15 years, had mild attacks, and had been vaccinated in infancy; and the father, aged 40, who had never been vaccinated, died. Those who escaped were two of those vaccinated in infancy, and one a child of 8, vaccinated when the others were attacked.

House 690.—The history of this family is of especial interest, since one of the three (out of five) attacked was a child of 5 years of age, who had been vaccinated successfully 3 weeks before. The first to fall ill was the mother (aged 26), who had been vaccinated in infancy, and had two fair marks. She had a coherent attack, and did not got to hospital. Her illness commenced on April 12th. On the 15th, one of her three children was vaccinated (the eldest of them had already been vaccinated). This child sickened with small-pox on May 7th, and died on the 16th. An infant, 16 months old, unvaccinated, was attacked on May 26th, and had a severe attack.

In perusing the notes taken of those households of which information was obtained, one is struck by the fact that not only was there an apparent shifting of the incidence of the disease from children to adults, but that the relative proportions of those attacked amongst the vaccinated and unvaccinated were also altering, whilst at the same time a far higher proportion occur of those who were vaccinated on the first appearance of the disease in the house, and who escaped infection. This increase in the recently vaccinated class is due to the fact that the officers of the vaccination committee by the board of guardians were now actively pursuing their house-to-house visitations.

Coincidently there is a further decline in the proportion of houses having multiple cases, for of the 202 invaded, 141 had single cases, and 61 multiple.

These houses were thus distributed:—

1. Kingsholm	-	4, with	7 cases.
2. St. Nicholas	-	14 ,,	20 ,,
3. South Hamlet	-	169 ,,	250 ,,
4. St. John Baptist	-	15 ,,	20 ,,

The *age*-incidence of the 297 attacks was:—

1 month and under	8 cases,	8 deaths.
1 month to 1 year	7 ,,	4 ,,
1 to 10 years	62 ,,	20 ,,
10 to 30 ,,	116 ,,	8 ,,
30 and over	104 ,,	15 ,,
	297	55

Of these cases there were removed to hospital 98, of whom 25 died.
Remained at home 199, of whom 30 died.

List of Houses known to be invaded by Small-pox during the Fortnight ending April 25th, 1896.

[Map 9.]

No. in House List.	Address.	District.	Inmates.					Cases.				
			1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.	1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.
404	26, Melbourn Street	III.	—	1	2	1	1	—	—	—	1,320	—
649	27, Nelson Street	III.	—	—	4	3	2	—	—	—	1,400, 1,639	1,775
650	68, New Conduit Street.	III.	—	—	2	1	2	—	—	—	—	1,149
651	34, Clifton Road	III.	—	—	1	3	2	—	—	—	1,150	—
652	1, Avenue Road	III.	—	—	1	4	2	—	—	—	1,152, 1,660	1,263
653	8, Cecil Road	III.	—	—	—	—	—	—	—	—	1,153	—
654	39, Victory Road	III.	1	—	—	1	1	*1,512*	—	—	*1,154*	—
655	14, Conduit Street	III.	—	—	2	1	1	—	—	—	—	1,155
656	26, Wellington Street	III.	—	—	1	2	2	—	—	—	*1,156*	—
657	50, St. Paul's Road	III.	—	—	—	1	2	—	—	—	1,157	—
658	"Mayville," Knowles Road.	III.	—	—	3	1	2	—	—	—	—	1,158
659	68, Victoria Street	III.	—	—	—	—	—	—	—	—	—	1,160
660	40, New Street	III.	—	—	1	—	2	—	—	1,162	—	—
661	17, Theresa Street	III.	—	—	1	3	2	—	—	—	*1,163*	—
662	Albert Villa, Linden Road.	III.	—	—	1	1	1	—	—	—	1,164	—
663	10, Magdala Terrace	III.	—	—	—	1	2	—	—	—	—	1,165
664	21, Conduit Street	III.	—	—	—	—	3	—	—	—	—	1,166
665	56, Melbourn Street	III.	—	—	—	—	2	—	—	—	—	1,167, 1,618
666	40, Sherborne Street	IV.	—	—	—	2	—	—	—	—	1,168, 1,543	—
667	Levi's Court, Westgate.	II.	—	—	1	4	2	—	—	—	1,306	*1,170*
668	43, Robin Hood Street	III.	—	—	—	3	2	—	—	—	1,172	—
669	21, Hyde Lane	I.	—	—	—	—	—	—	—	—	519	—
670	27, Castle Street	III.	—	—	1	3	1	—	—	—	1,177	—
671	3, Exhibition Street	III.	—	—	1	3	1	—	—	*1,179*	1,533	—
672	5, Alma Terrace	III.	—	1	3	—	2	—	*1,684*	1,180	—	1,580
673	13, Castle Street	III.	—	—	—	4	2	—	—	—	1,181	1,499
674	34, Tredworth Road	III.	—	—	2	—	2	—	—	1,182, 1,560	—	—
675	9, Victory Road	III.	—	—	2	4	2	—	—	—	1,183	—
676	143, Barton Street	III.	—	—	—	1	1	—	—	—	1,186	—
677	46, Robin Hood Street	III.	—	—	1	—	1	—	—	1,187	—	—
678	33, Alma Place	III.	—	—	6	4	2	—	—	*1,188, 1,492* 1,511, 1,698 *1,699.*	1,512, 1,701 1,913.	*1,700*
679	32, Victory Road	III.	—	—	2	1	1	—	—	1,191	—	—
680	96, Victoria Street	III.	—	—	4	—	2	—	—	1,196	—	—
681	36, Seymour Road	III.	—	—	1	1	2	—	—	—	—	1,197
682	10, Morton Street	III.	—	—	4	3	2	—	—	—	1,199	—
683	47, Alma Place	III.	—	—	2	1	1	—	—	—	—	1,200
684	3, Alma Place, St. James' Street.	III.	—	—	—	1	3	—	—	—	1,201	1,478
685	3, Massey Parade	III.	—	—	—	—	—	—	—	—	1,202	—
686	20, Alvin Street	IV.	—	—	—	1	1	—	—	—	1,203	1,590
687	42, New Street	III.	—	—	4	1	4	—	—	—	1,538	*1,204*
688	2, Sherborne Street	IV.	—	—	3	1	3	—	—	—	—	*1,205*
689	74, Castle Street	III.	—	—	—	—	—	—	—	—	—	1,206
690	5, Linden Road	III.	—	—	3	2	—	—	—	*1,693*, 1,821	1,207	—
691	13, Carmarthen Street	III.	—	1	3	1	1	—	—	—	1,208	—
692	164, Melbourn Street	III.	—	—	3	4	2	—	—	1,210	1,209	*1,420*
693	26, Carmarthen Street	III.	—	—	—	2	—	—	—	—	1,211	—
694	30, St. James' Street	III.	—	—	1	1	1	—	—	—	—	1,212
695	1, Witticomb Terrace, Kings Barton Street.	III.	—	—	—	2	2	—	—	—	1,213	—
696	59, Stroud Road	III.	—	—	1	—	2	—	—	—	—	1,215
697	5, Wyndale Terrace, St. Paul's Road.	III.	—	—	2	—	2	—	—	—	—	1,216
698	25, Victory Road	III.	—	—	—	1	1	—	—	—	1,217	—
699	6, Berkeley Villas, Bristol Road.	III.	—	—	—	—	—	—	—	—	1,218	—
700	11, St. James' Street	III.	—	—	—	2	3	—	—	—	*1,219*	—
701	196, Barton Street	III.	—	—	—	1	2	—	—	—	—	1,220
702	11, Union Street	IV.	—	—	—	—	2	—	—	—	—	*1,221*, 1,531
703	60, Castle Street	III.	—	1	—	—	2	—	—	—	—	1,225
704	10, Victory Road	III.	—	—	3	1	2	—	—	—	—	1,228, 1,612
705	110, New Street	III.	—	—	2	1	2	—	—	—	1,230	—
706	98, Barton Street	III.	—	—	—	—	—	—	*1,536*	—	—	*1,231*
707	149, High Street	III.	—	1	1	—	2	—	—	—	—	1,234
708	3, Bishopstone Road	I.	—	—	3	3	2	—	—	—	—	1,236
709	1, St. James' Street	III.	—	—	1	4	2	—	—	1,237	—	—
710	24, Morpeth Street	III.	—	—	—	3	2	—	—	—	1,238	—
711	21, Hopewell Street	III.	—	—	2	1	1	—	—	—	1,239	—
712	27, Sidney Street	I.	—	1	3	4	3	—	—	—	1,241, 1,379	—
713	101, Bristol Road	III.	—	—	—	—	3	—	—	—	—	*1,242*
714	25, Alvin Street	IV.	—	—	—	—	3	—	—	—	—	1,243
715	30, Morton Street	III.	—	—	2	—	2	—	—	1,244, *1,250*	—	—

No. in House List.	Address.	District.	Inmates.					Cases.				
			1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.	1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.
716	25, Castle Street	III.	—	—	1	2	—	—	—	—	1,245	—
717	47, New Street	III.	—	—	1	2	2	—	—	—	—	1,248
718	4, Cecil Road	III.	—	—	—	—	—	—	—	*1,253*	—	—
719	31, Ducie Street	III.	1	—	2	3	—	*1,298*	—	—	1,256, 1,297	—
720	23, Stroud Road	III.	—	—	1	3	2	—	—	—	1,257, 1,425	—
721	4, Forest Terrace	III.	1	—	—	3	—	*1,489*	—	—	1,258, 1,430	—
722	32, Moor Street	III.	—	—	3	5	—	—	—	1,553, 1,705	1,259, 1,552	—
723	19, Hopewell Street	III.	—	—	3	3	2	—	—	1,262	1,446	—
724	18, Melbourn Street	III.	—	—	—	1	1	—	—	—	—	1,264
725	4, Albany Street	III.	—		3	2	2	—	—	1,611	—	1,265
726	53, Bristol Road	III.	—	—	—	3	—	—	—	—	1,267	—
727	6, Ducie Cottages, Ducie Street.	III.	—	—	—	—	—	—	—	—	*1,268*	—
728	31, Victory Road	III.	—	—	2	3	4	—	—	—	1,272	1,437, *1,681*
729	30, Hanman's Road	III.	—	—	1	1	2	—	—	—	—	1,274
730	46, Lower Westgate Street.	II.	—	—	—	—	—	—	—	—	—	*1,275*
731	22, Melbourn Street	III.	—	—	3	1	1	—	—	*1,276*	—	—
732	46, Morton Street	III.	—	—	—	—	4	—	—	—	—	1,277, 1,878
733	23, Union Street	IV.	—	—	4	2	—	—	—	—	1,278	—
734	28, St. James' Street	III.	—	—	—	2	1	—	—	—	1,279, 1,616	—
735	Stephen's Court, Westgate.	II.	—	—	—	—	—	—	—	1,280, 1,309	—	1,283
736	35, Castle Street	III.	—	—	—	2	—	—	—	—	1,281	—
737	24, Clifton Road	III.	—	1	2	1	1	—	—	—	1,282	—
738	102, Priory Road	II.	—	—	—	4	2	—	—	—	1,284	—
739	13, Philip Street	III.	—	—	3	4	2	—	—	*1,286*, 979 1,507	1,434, 1,506	—
740	18, Paul Street	III.	—	—	—	—	—	—	—	—	1,293	—
741	43, New Street	III.	—	—	5	3	2	—	—	—	—	1,295, 1,588
742	2, Llandilo Street	III.	—	1	1	3	—	—	—	—	1,296	—
743	9, Morton Street	III.	—	—	4	3	2	—	—	—	1,299	—
744	21, Melbourn Street	III.	—	1	—	2	2	—	*1,399*	—	—	1,601
745	Stephen's Court, Westgate.	II.	1	—	2	1	2	*1,379*	—	—	—	1,302
746	Stephen's Court, Westgate.	II.	—	—	—	—	—	—	—	—	—	1,303
747	61, New Street	III.	—	—	2	3	—	—	—	*1,304*	—	—
748	17, Stroud Road	III.	—	—	1	2	2	—	—	—	1,307	—
749	45, Morton Street	III.	—	—	—	—	3	—	—	—	—	*1,308*
750	118, Barton Street	III.	—	—	1	2	2	—	—	—	1,311	—
751	40, Nelson Street	III.	—	—	3	6	1	—	—	—	1,313	—
752	30, Victory Road	III.	—	—	1	1	2	—	—	1,314	—	1,551, 1,650
753	46, Suffolk Street	IV.	—	—	1	6	3	—	—	—	1,316	1,475
754	17, Wellesley Street	III.	—	—	1	3	2	—	—	—	1,317	—
755	2, Quay Street	II.	—	—	1	5	3	—	—	—	1,318	—
756	1, Jersey Road	IV.	—	—	—	3	2	—	—	—	1,319	—
757	16, Blackfriars	IV.	—	2	1	2	—	—	—	—	1,321	—
758	42, Clement Street	III.	—	—	—	4	2	—	—	—	1,323	—
759	52, St. James' Street	III.	—	—	1	—	2	—	—	1,324	—	—
760	6, Back Cottage, St. James' Street.	III.	—	—	2	—	2	—	—	1,327, *1,365*	—	—
761	29, Clegram Road	III.	—	—	3	4	2	—	—	1,333, 1,334, 1,494.	1,335	—
762	13, Worcester Parade	IV.	—	—	—	—	—	—	—	—	1,336, 1,595	—
763	47, Melbourn Street	III.	—	—	5	1	1	—	—	*1,337*	—	—
764	11, Church Street	III.	—	—	1	2	2	—	—	—	1,338	—
765	74, Alvin Street	IV.	—	—	1	1	3	—	—	—	—	1,339
766	68, Milbrook Street	III.	—	—	—	—	2	—	—	—	—	*1,340*
767	3, Birchmore Road	I.	—	1	2	—	2	—	1,735	—	—	1,341, 1,661
768	24, Clement Street	III.	—	—	—	4	2	—	—	—	1,343, 1,344	—
769	48, Clement Street	III.	—	—	—	5	1	—	—	—	1,345	—
770	5, Church Street	III.	—	—	—	—	—	—	—	—	—	1,346
771	75, Howard Street	III.	—	—	4	—	2	—	—	1,347	—	—
772	126, Barton Street	III.	—	—	1	—	2	—	—	1,348	—	1,626, 1,686
773	9, Windsor Place, Milbrook Street.	III.	—	—	—	1	2	—	—	—	—	1,349
774	16, Conduit Street	III.	—	—	—	3	2	—	—	—	1,350	—
775	24, Upton Street	III.	—	—	—	1	2	—	—	—	1,351	—
776	Stephen's Court, Westgate.	II.	—	—	—	1	2	—	—	—	1,352	1,578
777	25, Tredworth Road	III.	—	—	—	1	1	—	—	—	1,353	—
778	4, St. Nicholas Terrace	II.	—	—	—	—	—	—	—	*1,354*	—	—
779	96, Barton Street	III.	—	—	—	—	—	—	—	—	—	1,355
780	5, Clare Terrace, Clegram Road.	III.	—	—	2	1	1	—	—	1,356	—	—
781	6, Blackfriars	IV.	1	—	2	1	2	*1,359*	—	—	—	—
782	15, Clement Street	III.	—	—	1	1	2	—	—	—	—	1,390
783	34, Stratton Road	III.	—	—	—	2	2	—	—	—	1,361	—
784	20, Sherborne Street	IV.	—	—	—	—	—	—	—	—	1,362	—
785	3, Clement Street	III.	—	—	2	6	2	—	—	—	1,363	—
786	50, Alma Place	III.	1	—	2	1	2	*1,632*	—	1,366	—	—
787	57, Ducie Street	III.	—	1	—	2	—	—	—	—	1,370	—
788	Stephen Court, Westgate.	II.	—	—	—	—	—	—	—	—	1,373	—

No. in House List.	Address.	District.	Inmates.					Cases.				
			1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.	1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.
790	Forester's Court, Westgate.	III.	—	—	3	1	1	—	—	1,375	—	*1,621*
791	27, Stroud Road -	III.	—	—	2	5	2	—	—	—	1,378	—
792	56, Clement Street -	III.	—	1	—	2	—	—	—	—	1,380	—
793	12, Paul Street -	III.	—	—	—	—	2	—	—	—	—	1,381
794	Dora Cottage, Carmarthen Street.	III.	—	—	2	2	3	—	—	—	1,423	1,382
795	129, Barton Street -	III.	—	—	3	2	1	—	—	1,384	—	1,383
796	33, Salisbury Road -	III.	—	—	3	3	1	—	—	—	1,385	—
797	138, Barton Street -	III.	—	—	—	3	2	—	—	—	1,387	—
798	34, Clement Street -	III.	—	—	1	2	2	—	—	—	—	1,388
799	Rose Cottage, Barton Street.	III.	—	—	—	1	2	—	—	—	*1,389*	—
800	57, New Street -	III.	—	1	2	2	—	—	—	—	1,391	—
801	12, Clement Street -	III.	—	1	—	2	—	—	*1,722*	—	1,392	—
802	13, Robin Hood Street	III.	—	—	2	3	2	—	—	—	—	1,395
803	Round House, Tredworth Road.	III.	—	—	2	2	2	—	—	—	—	1,396
804	1, Alma Place, St. James' Street.	III.	—	—	1	1	1	—	—	1,397	—	*1,635*
805	10, India Road -	III.	—	1	3	3	1	—	1,636	*1,398*, 1,665	1,605	1,769
806	58, Alma Place -	III.	—	—	2	2	1	—	—	—	*1,402*	—
807	Bath Buildings, Stroud Road.	III.	—	—	—	—	—	—	—	—	1,403	—
808	62, Robin Hood Street	III.	—	—	4	—	2	—	—	1,404	—	1,685
809	26, Barton Street -	III.	—	—	1	1	1	—	—	—	1,406	—
810	61, Rycroft Street -	III.	—	—	—	—	2	—	—	—	—	1,407
811	23, Milbrook Street -	III.	—	—	4	3	2	—	—	—	—	1,410
812	42, Tredworth Road -	III.	1	—	—	3	—	*1,561*	—	—	*1,411*	—
813	35, Ducie Street -	III.	—	—	—	—	—	—	—	1,413, 1,668	—	1,637
814	6, Paul Street -	III.	—	—	4	1	2	—	—	*1,414*, *1,743*	—	1,903
815	9, Matson Place -	III.	—	—	—	2	2	—	—	—	1,415	—
816	3, Clement Cottage -	III.	—	—	1	1	1	—	—	—	1,417	—
817	55, Victoria Street -	III.	—	1	4	—	2	—	—	*1,418*, *1,521*	—	1,520
818	21, Matson Place -	III.	—	—	—	2	1	—	—	—	1,419	—
819	38, Longsmith Street	III.	—	—	—	3	1	—	—	—	—	1,422
820	101, Howard Street -	III.	—	—	—	1	2	—	—	—	—	1,424
821	32, Hopewell Street -	III.	—	—	2	—	2	—	—	—	—	1,427
822	38, Hopewell Street -	III.	—	—	—	1	2	—	—	—	—	1,429
823	3, Dynevor Street -	III.	—	—	4	6	1	—	—	1,431	—	1,692
824	27, Barton Terrace -	III.	—	—	—	1	3	—	—	—	—	*1,438*
825	40, Melbourn Street -	III.	—	—	2	—	2	—	—	—	—	1,440
826	28, Clement Street -	III.	—	—	—	1	2	—	—	—	—	1,441
827	191, High Street -	III.	—	—	—	2	1	—	—	—	1,443	—
828	50, Salisbury Road -	III.	—	—	2	—	3	—	—	—	—	1,444, 1,709
829	48, Moor Street -	III.	—	1	4	1	2	—	—	1,445	—	—
830	21, Carmarthen Street	III.	—	—	—	—	3	—	—	—	—	1,449
831	6, St. James' Street -	III.	—	—	—	1	—	—	—	—	1,450	—
832	3, St. James' Street -	III.	—	1	—	2	—	—	1,451	—	—	—
833	26, St. Mary's Square	II.	—	—	—	—	—	—	—	—	—	1,452
834	17, Swan Lane -	IV.	—	—	—	—	—	—	—	—	—	1,457
835	1, Railway Cottage, Union Street.	IV.	—	—	—	—	—	—	—	—	1,458	—
836	30, Melbourn Street -	III.	—	—	2	1	2	—	—	—	—	1,459
837	78, Melbourn Street -	III.	—	—	1	—	2	—	—	—	—	1,460
838	"Laburnum" Inn, Albany Street.	III.	—	—	—	—	—	—	—	—	1,461	—
839	30, Albany Street -	III.	—	—	2	2	1	—	—	—	1,462	—
840	4, Castle Street -	III	—	—	3	2	2	—	—	*1,463*	—	—
841	6, Raglan Street -	III.	—	—	5	—	2	—	—	—	—	1,467
842	25, Carmarthen Street	III.	—	1	1	1	2	—	—	1,725	—	1,470, 1,741
843	Smith's Lodging House, Westgate.	II.	—	—	—	—	—	—	—	—	—	1,473
844	90, Lower Westgate	II.	—	—	—	1	—	—	—	—	1,474	—
845	3, Victoria Cottage, Barton Street.	III.	—	—	—	—	—	—	—	*1,479*	—	—
846	26, Clifton Road -	III.	—	—	1	—	4	—	—	—	—	1,480
847	12, Princes' Street -	III.	—	—	1	2	3	—	—	—	—	1,481
848	57, Rycroft Street -	III.	—	—	1	1	2	—	—	—	1,482	—
940	33, Ducie Street -	III.	—	—	—	—	—	—	—	*1,232*	—	1,229
944	13, Clement Street -	III.	1	—	—	2	1	*1,768*	—	—	1,360	1,662

X.

April 26th to May 9th.—An appreciable decline in the epidemic was observed during this fortnight, although cases were still being notified every day. The total number known to have arisen during this period was 197, and the newly invaded houses amounted to 101, precisely one-half of the number invaded during the previous

fortnight. The cases which occurred in these houses numbered 158, of whom 27 died. They were thus distributed :—

66	houses	yielded	1	case.
24	,,	,,	2	,,
3	,,	,,	3	,,
5	,,	,,	4	,,
3	,,	,,	5	,,

That Gloucester still contained unvaccinated children was seen by the fact that several were attacked in the first week in May, some of which may be cited :—

House 850.—In this house four adults were attacked, and two died. The first case was that of a man (1,485) employed at a public-house, who is supposed to have been infected by calling at houses where cases of small-pox were. He was 60 years of age, and had never been vaccinated; he was attacked on April 22nd, removed to hospital on the 26th, where he died on May 1st. The house was duly disinfected, but at the end of two months a second case occurred in it (No. 1,959); also a man 60 years of age (vaccinated), who was attacked on June 22nd, removed to hospital on the 29th, and died on July 2nd. The daughter of the first patient was attacked on July 11th, and the wife of the second patient on July 13th, the former having a mild, the latter a coherent attack; both were unvaccinated.

House 895.—In this family of eight the unvaccinated members, all children between 1 and 8 years of age, were the only ones attacked. They had enjoyed very good health previously,—indeed, I have been struck with the number of well-nourished, healthy-looking children who have been attacked in this epidemic. There is no ground for the belief that small-pox selects those who are already debilitated. The first of these children to fall ill was 5 years of age. His attack was a comparatively mild (discrete) one, and he was left at home. His illness commenced on April 25th, and on May 1st his brother, 4 years old, sickened, to be followed on the 8th and 14th by a girl, aged 8, and boy, aged 18 months. These children were removed in turn to the hospital, where they died. Two elder children (vaccinated) and the parents escaped.

House 904.—Here again those attacked were the unvaccinated children, four in number, ages ranging from 3 to 8. They fell ill one after another on May 1st, 19th, 31st, and 31st, and were all kept at home; three of the attacks were severe, one coherent.

House 906.—The only one to be attacked was a child of 8 years, who also was the only unvaccinated inmate of the household of seven persons. She was kept at home, and died.

House 924.—The father of this family died of small-pox in his house, on May 12th. Three of his children were attacked subsequently, two of them about a week, and the other nearly three weeks later, but their cases were not known to the authorities until the end of May. On my visit I found that another member (a girl of 11 years) had had a mild attack prior to her father's illness. She was vaccinated, and so was the man, but the three other children, aged 3 to 9 years, were unvaccinated, the eldest having a mild, the others confluent attacks.

House 929.—Here the mother (No. 1,641), a young woman of 25, was the first to be attacked. She remained at home, and her four unvaccinated children, of whom two died, sickened subsequently.

House No. 932.—The head of this household was the most active promoter of the hydropathic treatment to which reference has been made. He had a mild attack, as also had his son (who was then lodging away from home), both probably contracted in their visits to infected houses. The former's wife, 38 years of age, who had never been vaccinated, had a somewhat severe attack accompanied by much mental disturbance, whilst an unvaccinated infant had a comparatively slight (coherent), and a vaccinated daughter of 18, a very mild attack. The case of Mr. S. led subsequently to judicial proceedings, when he was fined for going about in public when still in an infected state. A young woman (No. 1,806) who was in close attendance on Mrs. S. during her illness, and who stated that she had been re-vaccinated six weeks previously, was inoculated on the cheek, where a characteristic "inoculated" pustule formed.

Of these 101 invaded houses there were situated :—

1. Kingsholm	-	-	-	6	houses, with	9 cases.
2. St. Nicholas	-	-	-	8	,, ,,	13 ,,
3. South Hamlet	-	-	-	78	,, ,,	121 ,,
4. St. John Baptist	-	-	-	9	,, ,,	15 ,,

The *age*-incidence of those attacked in the houses was :—

1 month and under - - -	1 case,	1 death.
1 month to 1 year - - -	1 „	0 „
1 to 10 years - - - -	46 „	14 „
10 to 30 years - - -	58 „	3 „
30 and over - - -	52 „	9 „
	158	27

Of these cases three were removed to hospital 36, of whom 11 died.
Remained at home 122, of whom 16 died.

List of Houses known to be Invaded by Small-Pox during the Fortnight ending May 9th, 1896.

[Map 10.]

No. in House List.	Address.	District.	Inmates.					Cases.				
			1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.	1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.
849	22, Victory Road -	III.	—	—	—	—	—	—	—	—	—	1,483, *1,682*
850	Buxton Villa, Adelaide Street.	III.	—	1	—	3	3	—	—	—	1,971	*1,483, 1,953* 1,978
851	8, Llandilo Street -	III.	—	—	—	1	2	—	—	—	—	1,486
852	78, Adelaide Street -	III.	—	—	2	4	2	—	—	—	1,487	—
853	50, India Road -	III.	—	1	2	2	—	—	—	—	1,490	—
854	32, Alma Place -	III.	—	1	4	1	2	—	—	1,493, 1,509	—	—
855	9, Nelson Street -	III.	—	—	—	2	1	—	—	—	1,495, 1,818	—
856	Twin Cottage, Barton Street.	III.	—	1	5	2	2	—	—	1,497	—	1,655
857	9, Victoria Street -	III.	—	—	1	—	3	—	—	1,496	—	1,559, *1,717*
858	20, Castle Street -	III.	—	—	—	—	—	—	—	—	—	1,502
859	80, Sherborne Street	IV.	—	—	—	—	—	—	—	1,503	—	—
860	103, Barton Terrace	III.	—	—	—	—	—	—	—	—	1,504	—
861	Stanley Cottage, Barton Street.	III.	—	—	1	1	1	—	—	—	1,505	—
862	3, Alma Place -	III.	—	—	3	2	—	—	—	*1,586*, 1,730	1,508, 1,712	—
863	56, Alma Place -	III.	—	1	5	2	2	—	—	1,510, 1,548	—	—
864	31, Clegram Road -	III.	—	—	1	3	2	—	—	—	1,526	—
865	51, Adelaide Street -	III.	—	1	2	2	2	—	—	1,527, 1,528	1,736	1,714
866	78, Hare Lane -	IV.	—	—	—	—	—	—	—	—	1,532	—
867	78, Milbrook Street -	III.	—	—	1	—	2	—	—	—	—	1,529
868	9, Alma Place -	III.	—	—	2	—	3	—	—	*1,535*, 1,740	—	—
869	4, Linden Terrace -	III.	—	—	2	3	—	—	—	—	1,536	—
870	Bath Buildings, Stroud Road.	III.	—	—	—	—	—	—	—	—	—	1,537
871	Tory Cottage, Deacon Street.	II.	—	—	—	—	—	—	—	*1,542*	—	1,676, 1,694
872	Bullingdon Passage, Barton Street.	III.	—	—	—	—	—	—	—	*1,544*	—	—
873	81, New Street -	III.	—	—	—	—	3	—	—	—	—	1,545
874	24, St. Paul's Road -	III.	—	—	—	3	1	—	—	—	—	1,546
875	98, Alma Place -	III.	1	—	—	3	—	*1,547*	—	—	1,708	—
876	13, Parkend Road -	III.	—	—	—	1	2	—	—	—	—	1,549
877	Llanthony Cottage -	III.	—	—	—	3	2	—	—	—	1,550	1,748
878	18, Russell Street -	IV.	—	—	—	1	1	—	—	—	1,554	—
879	7, St. Luke Street -	III.	—	1	4	1	3	—	—	—	—	1,557
880	37, Alma Place -	III.	—	—	2	1	2	—	—	*1,558*	—	—
1,094	128, Lower Barton Street.	III.	—	—	—	—	—	—	—	—	1,954	—
1,095	1, Gothic Cottage, Barton Street.	III.	—	—	—	—	—	—	—	—	1,955	—
881	4, Alma Terrace -	III.	—	—	2	1	1	—	—	1,562	—	—
882	6, New Street -	III.	—	—	3	4	2	—	—	—	1,563	—
883	14, New Street -	III.	—	—	3	1	2	—	—	—	—	1,564
884	16, Herbert Road -	I.	—	—	—	2	—	—	—	—	1,565, *1,726*	—
885	24, Worrall Street -	II.	—	—	—	—	2	—	—	—	—	1,567
886	14, Sebert Street -	II.	—	—	—	1	2	—	—	—	—	1,568, 1,797
887	43, Sherborne Street	IV.	—	—	1	4	1	—	—	—	1,569	1,628
888	7, Twyver Street -	I.	—	1	3	1	2	—	—	1,570	—	—
889	24, Victory Road -	III.	—	—	—	—	—	—	—	—	—	1,571
890	1, Cecil Road -	III.	—	—	4	—	2	—	—	—	—	1,572
891	Levi's Court, Westgate.	II.	—	—	—	—	—	—	—	—	—	1,573
892	84, Sherborne Street	IV.	—	—	—	—	—	—	—	—	—	1,574, 1,760
893	14, Herbert Road -	I.	—	—	—	1	1	—	—	—	1,575	—
894	18, Worrall Street -	II.	—	—	—	—	—	—	—	—	1,576	1,624

No. in House List.	Address.	District.	Inmates.					Cases.				
			1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.	1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.
895	59, Barton Terrace	III.	—	—	4	2	2	—	—	1,583, *1,613* *1,683*, *1,742*	—	—
896	Knowles Road	III.	—	—	—	1	2	—	—	—	—	1,591
897	28, Lower Barton Street.	III.	—	—	—	1	2	—	—	—	—	*1,592*
899	45, Milbrook Street	III.	—	—	—	—	2	—	—	—	—	1,594
900	55, Alma Place	III.	—	—	4	1	2	—	—	1,585	—	—
902	121, Rycroft Street	III.	—	—	—	2	—	—	—	—	1,596	—
903	68, India Road	III.	—	—	—	—	—	—	—	—	1,597	—
904	57, St. Paul's Road	III.	—	—	4	—	2	—	—	1,598, 1,782 1,857, 1,858	—	—
905	31, Mitre Street	IV.	—	—	—	—	—	—	—	—	1,599	—
906	25, Nelson Street	III.	—	—	1	5	1	—	—	*1,600*	—	—
907	23, Alma Place	III.	—	1	1	1	1	—	—	—	1,602	—
908	6, Chapel Street, St. Mary's Square.	II.	—	—	3	2	2	—	—	1,721	1,603	—
909	14, Upton Street	III.	—	1	—	1	1	—	—	—	1,604	—
910	35, Worrall Street	II.	—	—	3	2	2	—	—	—	1,608	—
911	38, Philip Street	III.	—	—	—	2	2	—	—	—	—	1,609
913	18, Tredworth Road	III.	—	—	—	—	—	—	—	—	1,614	—
914	51, Parkend Road	III.	—	—	—	—	—	—	—	—	1,615	—
915	Brown's Lodging House, Longsmith Street.	IV.	—	—	—	—	—	—	—	—	1,617	—
916	12, Alma Place	III.	—	—	2	1	2	—	—	1,619	1,783	—
917	39, Theresa Street	III.	—	—	—	—	—	—	—	—	1,620	1,732
918	26, Salisbury Road	III.	—	—	—	2	2	—	—	—	1,622	—
919	Florence Villa, Clegram Road.	III.	—	—	—	1	2	—	—	—	—	1,623
920	Alexander Terrace, Clegram Road.	III.	—	—	3	—	2	—	—	—	—	1,625
921	15, Hare Lane	IV.	—	—	—	—	—	—	—	—	—	1,627
922	51, Philip Street	III.	—	—	1	4	2	—	—	—	—	1,629
923	31, Cecil Road	III.	—	—	—	1	1	—	—	—	—	1,630
924	46, Clifton Terrace	III.	—	—	3	2	2	—	—	1,786, 1,787 1,788	1,634	*1,631*
925	45A, Morton Street	III.	—	—	—	—	—	—	—	1,667	—	—
926	4, Massey Parade	III.	—	—	—	—	—	—	—	—	—	1,633
927	52, Melbourn Street	III.	—	—	1	3	—	—	—	—	*1,638*, 1,798	—
928	34, Robin Hood Street.	III.	—	—	—	1	1	—	—	—	1,640	—
929	13, Ducie Street	III.	—	—	—	—	—	—	—	*1,707*, 1,729 1,819, *1,820*	1,641	—
930	18, Sinope Street	III.	—	—	—	3	2	—	—	—	1,642	—
931	10, Stroud Road	III.	—	—	1	3	2	—	—	—	1,643	—
932	26, Worcester Street	IV.	—	—	3	5	2	—	—	1,745	1,779, 1,806	1,644, 1,674
933	14, Clement Street	III.	—	—	—	2	—	—	—	—	1,645, 1,697	—
934	Roath Villa, Clegram Road.	III.	—	1	2	1	2	—	—	*1,646*	1,785	—
935	22, Knowles Road	III.	—	—	—	—	—	—	—	—	*1,647*	—
936	116, Milbrook Street	III.	—	—	—	—	—	—	—	—	1,648, 1,764	—
937	106, Alma Place	III.	—	—	2	1	2	—	—	1,871, 1,938	—	1,652
938	34, Birchmore Road	I.	—	1	4	—	2	—	1,781	*1,653*	—	—
939	23, Princes Street	III.	—	—	—	—	—	—	—	*1,654*	—	—
941	2, Alfred Street	III.	—	1	1	1	3	—	—	—	—	*1,657*
942	30, Weston Road	III.	—	—	2	4	2	—	—	—	—	1,658
943	19, Rycroft Street	III.	—	—	1	3	1	—	—	1,659	—	—
945	114, Westgate	II.	—	—	—	—	—	—	—	—	1,663	—
946	58, Hopewell Street	III.	—	—	3	—	2	—	—	—	—	*1,664*
947	9, St. James' Street	III.	—	1	2	3	2	—	—	1,666	1,793	—
948	62, Alma Place	III.	—	—	—	2	—	—	—	—	1,669	—
949	21, Vauxhall Road	III.	—	1	1	—	2	—	—	—	—	*1,672*
950	39, Clement Street	III.	—	—	4	1	2	—	—	—	1,673	1,801
051	Union Workhouse	I	—	—	—	—	—	—	—	—	—	1,675
952	37, Twyver Street	I.	—	—	2	4	2	—	—	—	1,677, 1,737	—

XI.

May 10*th to May* 23*rd*.—The number of cases known to have arisen during this fortnight was 116. There were 49 new invasions of houses, again a decrease of one-half, and the number of cases that occurred in themwas 75, of whom 21 died.

32 houses yielded 1 case.
11 „ „ 2 „
4 „ „ 3 „
1 „ „ 4 „
1 „ „ 5 „

House 963.—Here the first to be attacked was the mother (aged 33), she was vaccinated, and had a confluent attack. She was nursing her unvaccinated infant at

the time, and the child was actually in bed with its mother when the rash was out upon the latter. The mother's illness began on May 6th, the child's not until the 28th. The infant passed through a severe confluent attack. The attendant upon these cases was one of the young women referred to as assisting in the hydropathic treatment. She had attended other cases, but early in her sojourn at this house she had prodromal symptoms followed by an eruption which, I believe from its character, to have been variolous, although this was stoutly disputed by herself.

House 964. — This house was occupied by two young married couples. Three unvaccinated children (3 years and under), two belonging to one family and one to the other, died, and the father of the single child had a discrete attack. These cases were all retained at home.

House 965.—In this house five out of a family of nine were attacked. The house is in a rather thickly peopled part, and the owner resisted the attempt of the sanitary officials to remove the first case. As others fell ill he yielded, seeing the impossibility of nursing them at home. The four unvaccinated members of the family (aged 9 months to 17 years) were attacked, one dying at home from malignant small-pox; a lad of 18 (vaccinated) had a discrete attack.

House 992.—Here two unvaccinated children (8 and 3 years) died, two others under 10 were vaccinated on the appearance of small-pox, and there were four other vaccinated members of the family, one of whom, the father, was inoculated with small-pox by one of his sick children.

The 49 houses were situated in the districts as follows :—

1. Kingsholm	2 with	2 cases.
2. St. Nicholas	1 „	1 „
3. South Hamlet	40 „	62 „
4. St. John Baptist	6 „	10 „

The *age*-incidence of the 75 attacked in these houses was :—

1 month to 1 year	7 cases,	5 deaths.
1 to 10 years	23 „	12 „
10 to 30 years	25 „	1 „
30 years and over	20 „	3 „
	75	21

Of these 75 cases there were—
Removed to hospital 13, of whom 5 died.
Remained at home 62, of whom 16 died.

List of Houses known to be invaded by Small-Pox during the fortnight ending May 23rd, 1896.

[Map 11.]

No. in House List.	Address.	District.	Inmates.					Cases.				
			1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.	1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.
953	65, Linden Road	III.	—	—	2	1	2	—	—	—	—	1,679
954	9, Clement Street	III.	—	—	1	3	1	—	—	—	1,680	—
955	8, Havelock Terrace	III.	—	—	—	3	2	—	—	—	1,687	1,810
956	112, Melbourn Street	III.	—	—	4	2	2	—	—	*1,688*	—	—
957	29, Morpeth Street	III.	—	—	—	—	—	—	*1,875*	—	1,689	—
959	11, Herbert Road	I.	—	—	—	3	2	—	—	—	—	1,691
960	27, Victoria Street	III.	—	—	—	—	—	—	—	—	—	1,693
961	12, Mitre Street	IV.	—	—	—	4	1	—	—	—	1,696	—
962	"Wheatsheaf," Southgate	III.	—	—	—	—	—	—	—	—	1,690	—
963	60, Widden Street	III.	—	1	—	1	4	—	1,822	—	1,873	1,703
964	42, Nelson Street	III.	—	1	3	2	2	—	*1,706*	*1,811, 1,812*	1,877	—
965	60, Suffolk Street	IV.	—	1	3	3	2	—	*1,804*	1,711, *1,805* 1,807	1,803	—
966	88, New Street	III.	—	—	1	3	2	—	—	—	1,715	—
967	31, Morpeth Street	III.	—	1	1	2	3	—	—	—	—	1,716
968	3, Dainty Street	III.	—	—	—	—	—	—	—	1,718, *1,794* 1,795	—	—
969	27, Clegram Road	III.	—	—	2	4	2	—	—	*1,719*	—	1,839
970	6, Clifton Road	III.	—	1	3	4	2	—	—	*1,773*	—	1,720
971	1, Alma Terrace	III.	—	—	2	3	1	—	—	*1,723*, 1,840	—	—

No. in House List.	Address.	District.	Inmates.					Cases.				
			1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.	1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.
972	33, Castle Street -	III.	—	1	1	1	1	—	—	—	—	1,724
973	76, Melbourn Street -	III.	—	—	2	—	2	—	—	—	—	1,727, 1,902
974	3, George's Row, Morton Street.	III.	—	—	1	—	2	—	—	—	—	1,728
975	3, Norman's Row, Quay Street.	II.	—	—	—	—	—	—	—	—	1,731	—
976	19, Twyver Street -	I.	—	—	3	2	—	—	—	—	*1,734*	—
977	3, Baker Street -	III.	—	—	2	1	1	—	—	1,817	1,738	—
978	10, Ducie Cottages -	III.	—	—	—	1	2	—	—	—	1,744	—
979	82, Northgate -	IV.	—	—	2	—	2	—	—	1,746	—	—
980	63, Barton Terrace -	III.	—	—	—	—	—	—	—	—	—	*1,747*
981	35, Alma Place -	III.	—	—	1	1	1	—	—	1,749	—	—
982	44, Derby Road -	III.	—	—	—	1	2	—	—	—	1,750	—
983	27, Wellesley Street-	III.	—	—	—	—	—	—	—	—	1,754	—
984	44, Morton Street -	III.	—	—	—	2	1	—	—	—	1,755	—
985	14, Victory Road -	III.	—	—	1	2	—	—	—	1,756	1,870	—
986	20, Hopewell Street -	III.	—	—	—	—	2	—	—	—	—	*1,757*
987	1, Alma Place -	III.	—	—	2	2	2	—	—	1,758, *1,867*	—	—
988	118, Melbourn Street	III.	—	1	1	3	—	—	—	—	1,759	—
989	6, Alfred Street -	III.	—	1	1	—	3	—	*1,761*	—	—	—
990	64, Moor Street -	III.	—	1	2	2	1	—	*1,763*	—	—	—
991	"King William" Inn, Alvin Street.	IV.	—	—	—	—	—	—	—	—	—	*1,766*
992	5, Knowles Road -	III.	—	—	4	2	2	—	—	*1,767, 1,868*	—	1,910
993	82, Regent Street -	III.	—	1	3	3	2	—	—	—	1,771	—
994	20, Charles Street -	III.	—	—	—	2	1	—	—	—	1,772	—
995	"Fernleigh," Linden Road.	III.	—	1	3	4	2	—	—	—	—	1,774
996	31, Alma Place -	III.	—	—	4	3	1	—	—	*1,808*	1,776	1,796
997	4, Victory Road -	III.	—	—	—	—	—	—	—	—	1,777	—
998	10, Alma Pace -	III.	—	1	1	—	1	—	1,976	—	—	1,778
999	10, Widden Street -	III.	—	1	1	2	2	—	—	1,789	—	1,876
1,000	27, Clement Street -	III.	—	—	—	4	—	—	—	—	1,790	—
1,001	8, Sherborne Street -	IV.	—	1	2	4	1	—	—	—	1,791	—
1,002	68, Sherborne Street	IV.	—	—	1	2	—	—	—	—	1,792	—

XII.

May 24th to June 6th.—During this fortnight there was an interruption of the previously rather rapid decline of the epidemic—for 105 cases came under notice, and as many as 58 houses were newly invaded. These houses yielded in all 82 cases, of which only nine were fatal, there being thus, in respect to fatality, a very marked improvement.

45 houses yielded 1 case.
8 „ „ 2 cases.
3 „ „ 3 „
2 „ „ 6 „

House 1,021.—In the same road (comparatively new, semi-detached villas) as the one just referred to (No. 992) and the next to be mentioned (No. 1,046). In this house several cases had occurred which were not notified at the time, but the death of one of these children (No. 1,831) drew the attention of the authorities to it. There were in all six attacked, including two vaccinated, and two who were "undergoing" vaccination, as well as two who had never been vaccinated. The cases of the vaccinated children (aged 16 and 17) were quite mild, and three of the others, with the exception of the fatal one, aged 9 months to 8 years, were of the coherent type. The parents and two children (vaccinated) escaped.

House 1,046.—Here, also, there were six attacked, the first being the maternal grandfather, aged 73, a subject of paralysis agitans, who was removed to hospital on June 3rd. The father and mother alone escaped, for all the children at ages ranging from 18 months to 11 years were attacked, three of them severely, and one, the youngest, fatally. The first cases were cared for at home, but as the later ones arose they were sent to the hospital.

The 58 houses invaded during this fortnight were situated in:—

1. Kingsholm - - - 6 houses, with 8 cases.
2. St. Nicholas - - 3 „ „ 4 „
3. South Hamlet - - - 45 „ „ 62 „
4. St. John Baptist - - 4 „ „ 8 „

The *age*-incidence of those attacked in them was :—

1 month to 1 year - -	2 cases,	1 death.
1 to 10 years - - -	14 „	3 „
10 to 30 years - -	38 „	2 „
30 and over - - -	28 „	3 „
	82	9

Of these 82 cases there were—

Removed to hospital 20, of whom 4 died.
Remained at home 62, of whom 5 died.

List of Houses known to be invaded by Small-Pox during the fortnight ending June 6th, 1896.

[Map 12.]

No. in House List.	Address.	District.	Inmates.					Cases.				
			1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.	1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.
953	Ship "George," Docks.	IV.	—	—	—	—	—	—	—	—	510	—
1,003	Gardner's Row, Kingsholm.	II.	—	—	2	1	2	—	—	—	—	1,799
1,004	Alexandra Villas, Clegram Road.	III.	—	—	1	—	2	—	—	—	—	*1,800*
1,005	1, Massey Parade -	III.	—	—	3	4	2	—	—	817, 1,374, 1,606	—	—
1,006	16, Alma Place -	III.	—	—	—	2	—	—	—	—	1,809	—
1,007	2, Massey Parade -	III.	—	—	—	1	2	—	—	—	—	1,813
1,008	27, Moor Street -	III.	—	—	—	—	—	—	—	—	1,770	—
1,009	100, New Street -	III.	—	—	1	1	1	—	—	1,802	1,905	—
1,010	33, Moor Street -	III.	—	—	—	—	—	—	—	—	*1,814*	—
1,011	11, Alma Place -	III.	—	—	—	—	2	—	—	—	—	1,815
1,012	12, Linden Road -	III.	—	1	—	2	—	—	—	—	1,816	—
1,013	2, Sinope Street -	III.	—	—	2	—	2	—	—	—	—	1,823
1,014	19, Sidney Street -	I.	—	—	2	3	2	—	—	—	1,824	—
1,015	28, Victoria Street -	III.	—	—	—	—	—	—	—	—	*1,825*	—
1,016	110, Melbourn Street	III.	—	—	1	6	4	—	—	—	—	1,826
1,017	21, Dynevor Street -	III.	—	—	—	3	1	—	—	—	1,827	—
1,018	20, Worrall Street -	II.	—	—	—	2	—	—	—	—	1,828	—
1,019	2, Herbert Road -	I.	—	—	4	2	2	—	—	—	—	1,829
1,020	16, Carmarthen Street	III.	—	—	—	2	—	—	—	—	1,830	—
1,021	6, Knowles Road -	III.	—	1	3	4	2	—	1,833	*1,831*, 1,832 1,946	1,947, 1,948	—
1,022	34, Derby Road -	III.	—	—	—	—	—	—	—	—	—	*1,834*
1,023	16, Hethersett Road	III.	—	—	3	4	1	—	—	1,835	1,922	—
1,024	7, Magdala Road -	III.	—	—	—	2	1	—	—	—	1,836	—
1,025	4, Sweetbriar Street	IV.	—	—	1	5	2	—	—	—	1,916, 1,963	1,837
1,026	106, Alfred Street -	I.	—	—	—	1	1	—	—	—	1,920	1,838
1,027	19, Magdala Road -	III.	—	—	—	—	—	—	—	—	1,784	—
1,028	11, Cecil Road -	III.	—	1	1	2	—	—	—	—	1,841	—
1,029	36, Albany Street -	III.	—	—	—	—	2	—	—	—	—	1,842
1,030	11, Charles Street -	III.	—	—	—	—	—	—	—	—	—	1,843
1,031	59, Suffolk Street -	IV.	—	—	—	—	—	—	—	*1,879*	—	*1,844*
1,032	24, Jersey Road -	III.	—	—	—	1	2	—	—	—	—	1,847
1,033	21, India Road -	III.	—	1	—	1	1	—	—	—	1,848	—
1,034	114, Melbourn Street	III.	—	—	—	5	2	—	—	—	1,849	—
1,035	6, George's Row, Morton Street.	III.	—	1	1	2	—	—	—	—	1,850	—
1,036	13, Sherborne Street	IV.	—	—	—	—	—	—	—	—	1,851	1,915
1,037	65, Upton Street -	III.	—	—	—	—	—	—	—	—	1,852	—
1,038	"Homelands," Lower Barton Street.	III.	—	—	1	7	3	—	—	—	1,853, 1,861	—
1,039	11, Dainty Street -	III.	—	1	—	2	—	—	—	—	1,854	—
1,040	5, George's Row, Morton Street.	III.	—	—	—	—	—	—	—	—	1,855	—
1,041	47, Brook Street -	III.	—	—	1	2	2	—	—	—	—	1,856
1,042	16, Twyver Street -	I.	—	—	2	1	2	—	—	—	—	1,959, 1,925
1,043	4, Counsel Street -	II.	—	—	—	—	—	—	—	1,860	1,945	—
1,044	30, Birchmore Road	I.	—	—	—	3	1	—	—	—	—	1,862
1,045	5, Albert Street -	III.	—	—	—	—	—	—	—	—	1,863	—
1,046	24, Knowles Road -	III.	—	—	4	1	3	—	—	1,899, 1,928, 1,935, *1,940*	1,937	1,864
1,047	121, High Street -	III.	—	—	—	—	—	—	—	—	—	1,865
1,048	7, Birchmore Road -	I.	—	1	2	1	1	—	—	—	1,866	—

No. in House List.	Address.	District.	Inmates.					Cases.				
			1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.	1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.
1,049	St. Ann's Terrace, Seymour Road.	III.	—	—	—	4	3	—	—	—	1,869, 1,883	1,882
1,050	55, Ducie Street -	III.	—	—	—	2	—	—	—	—	1,872	—
1,051	4, Clare Terrace, Clegram Road.	III.	—	1	—	2	—	—	*1,874*	—	—	—
1,052	122, Melbourn Street	III.	—	—	1	4	2	—	—	—	—	1,880
1,053	59, Tredworth Road -	III.	—	—	—	2	2	—	—	—	—	1,881
1,054	57, Brook Street -	III.	—	—	—	—	—	—	—	—	—	1,884
1,055	45, Rycroft Street -	III.	—	—	1	2	1	—	—	—	—	1,885
1,056	76, Milbrook Street -	III.	—	—	—	—	2	—	—	—	—	1,886
1,057	5, Derby Road -	III.	—	—	—	—	—	—	—	—	1,887	—
1,058	51, Alma Place -	III.	—	—	—	1	2	—	—	—	1,888	—
1,059	117, High Street -	III.	—	—	—	2	2	—	—	—	—	1,890

XIII.

June 7th to June 20th.—The notifications now fell to two to four daily, the total number of cases known during the fortnight being 36. There were 20 new invasions; 29 cases arising in these houses, 7 of them fatal.

17 houses yielded 1 case.
2 „ „ 2 cases.
1 „ „ 8 „

Reference may be made to the last-mentioned.

House 1,064.—Eight out of the nine members of this family were attacked, and the cases of several of them were not notified. Five of them were retained at home, three sent to hospital. Three died, viz., unvaccinated children, aged 3, 4, and 7 respectively; two other unvaccinated children were also attacked, the youngest, aged 14 months, having the least severe attack. The father and a daughter of 13 had mild attacks, the mother also a very mild (inoculated) attack. They had been vaccinated in infancy, as also was another daughter, aged 16, who was the only one to escape.

These houses were situated in :—

1. Kingsholm - - 1 house, with 1 case.
2. S. Nicholas - - - 1 „ „ 1 „
3. South Hamlet - - 17 „ „ 26 „
4. St. John Baptist - - 1 „ „ 1 „

The *age*-incidence of the 29 cases was : —

1 to 10 years - - -	9 cases,	4 deaths.
10 to 30 years - - -	9 „	—
30 and over - - -	11 „	3 „
	29	7

Of these cases there were—

Removed to hospital 15, of whom 1 died.
Remained at home 14, of whom 6 died.

List of Houses known to be invaded by Small-Pox during the Fortnight ending June 20th, 1896.

[Map 13.]

No. in House List.	Address.	District.	Inmates.					Cases.				
			1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.	1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.
1,060	4, Exhibition Street	III.	—	—	—	—	—	—	—	—	—	1,891
1,061	10, Dynevor Street	III.	—	—	4	—	2	—	—	—	—	1,892
1,062	33, Clegram Road	III.	—	—	—	—	—	—	—	—	—	*1,893*
1,063	94, Alma Place	III.	—	—	1	3	1	—	—	—	1,894	—
1,064	74, India Road	III.	—	—	5	2	2	—	—	1,895, *1,897* *1,898, 1,906* 1,912.	1,907	1,908, 1,909
1,065	122, High Street	III.	—	—	—	—	—	—	—	1,896	—	—
1,066	Worrall Court	II.	—	—	2	2	2	—	—	*1,900*	—	—
1,067	15, Albert Street	III.	—	—	5	1	2	—	—	—	—	*1,901*
1,068	16, Paul Street	III.	—	—	—	—	—	—	—	—	1,904	*1,909*
1,069	8, Paul Street	III.	—	—	—	—	—	—	—	—	—	1,911
1,070	80, New Street	III.	—	—	1	2	1	—	—	—	—	1,914
1,071	7, Seymour Road	III.	—	—	—	—	—	—	—	—	—	1,917
1,072	28, Windmill Parade	I.	—	—	—	—	—	—	—	—	1,918	—
1,073	82, Milbrook Street	III.	—	—	—	—	—	—	—	—	1,921	—
1,074	1, Clement Cottages	III.	—	—	—	—	—	—	—	—	1,923	—
1,075	15, Magdala Road	III.	—	—	—	—	—	—	—	—	1,924	—
1,076	6, Dainty Street	III.	—	—	3	2	—	—	—	1,926	—	—
1,077	48, Barton Terrace	III.	—	—	—	—	—	—	—	—	1,927	1,967
1,079	3, Parliament Street	IV.	—	—	—	—	—	—	—	—	1,930	—
1,080	Wildmans Court, Barton Street.	III.	—	—	—	—	—	—	—	1,931	—	—

XIV.

June 24th to July 4th.—During this fortnight there was a comparatively slight fall from the previous one, 36 cases coming to the knowledge of the authorities, and more occurring towards the end of the fortnight than at the beginning. There were 20 houses newly invaded, precisely the same as in the preceding two weeks. There occurred in these houses 23 cases, of which 2 were fatal.

17 houses yielded 1 case.
3 „ „ 2 cases.

The houses were situated in—

1. Kingsholm - - 2 houses, with 2 cases.
2. S. Nicholas - - 3 „ „ 4 „
3. South Hamlet - - 13 „ „ 15 „
4. St. John Baptist - - 2 „ „ 2 „

The *age*-incidence of the 23 attacks was:—

1 to 10 years - - -	2 cases.	
10 to 30 years - - -	10 „	
30 and over - - -	11 „	2 deaths.
	23	2

Of these 23 cases there were—
Removed to hospital 7, of whom 2 died.
Remained at home 16, of whom none died.

List of Houses known to be invaded by Small-Pox during the Fortnight ending July 4th, 1896.

[Map 14.]

No. in House List.	Address.	District	Inmates.					Cases.				
			1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.	1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.
1,078	15, Percy Street -	III.	—	—	1	3	2	—	—	—	—	1,962
1,081	Sudbrook House, Southgate.	III.	—	—	—	—	—	—	—	—	—	1,932
1,082	115, High Street -	III.	—	—	—	1	1	—	—	—	—	1,933
1,083	7, Alma Place -	III.	—	—	—	2	2	—	—	—	1,934	—
1,084	12, Cecil Road -	III.	—	—	1	2	—	—	—	—	1,936	—
1,085	Rock Villa, Falkner Street.	III.	—	—	—	—	—	—	—	—	1,939	—
1,086	29, Birchmore Road	I.	—	—	—	—	—	—	—	—	—	1,941
1,087	10, Herbert Road -	I.	—	—	—	—	—	—	—	—	1,942	—
1,088	22, Sherborne Street	IV.	—	1	—	2	—	—	—	—	1,943	—
1,089	25, Magdala Terrace	III.	—	1	3	1	2	—	—	—	—	1,944
1,090	2, Worrall Court -	II.	—	—	—	2	—	—	—	—	1,949	—
1,091	3, Worrall Street -	II.	—	—	—	1	1	—	—	—	1,950	1,972
1,092	2, Clifton Road -	III.	—	—	—	—	—	—	—	—	—	1,951
1,093	60, Adelaide Street -	III.	—	—	2	2	2	—	—	—	1,952	—
1,096	15, Counsel Street -	II.	—	—	—	—	—	—	—	—	1,959	—
1,097	142, Melbourn Street	III.	—	—	1	2	2	—	—	—	—	1,960
1,098	24, Alma Place -	III.	—	—	3	2	2	—	—	1,961	—	—
1,099	63, New Street -	III.	—	—	—	—	2	—	—	—	—	1,964, 1,979
1,100	21, Sweetbriar Street	IV.	—	—	—	—	—	—	—	—	—	1,965
1,101	Whitehouse Passage, Barton Street.	III.	—	—	—	—	—	—	—	1,966	1,968	—

XV.

July 4th to July 18th.—The decline which now took place was somewhat remarkable. The disease had retained its footing during the hot dry weather that occurred in the month of June, although with notably diminished fatality, as well as a diminution in the number of cases arising in separate families. During this fortnight, however, it nearly ceased, for on nine almost consecutive days there had been no cases notified. The total amounted to eight cases, whilst only four new houses were invaded, yielding four cases, with one death. One of these houses was in the Kingsholm district and three in the South Hamlet.

The *age*-incidence of the four cases was:—

10 to 30 years - - -	3 cases,	1 death.
30 and over - - -	1 case.	
	4	1

Of these 4 cases there were—

Removed to hospital 3, of whom 1 died.

Remained at home 1, of whom none died.

List of Houses known to be invaded by Small-Pox during the Fortnight ending July 18th, 1896.

[Map 15.]

No. in House List.	Address.	District.	Inmates.					Cases.				
			1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.	1 Month and under.	1 Month to 1 Year.	1 to 10.	10 to 30.	30 and over.
1,102	76, Alfred Street -	I.	—	—	—	—	—	—	—	—	1,970	—
1,103	17, Percy Street -	III.	—	—	—	—	—	—	—	—	—	1,973
1,104	32, Melbourn Street -	III.	—	—	—	—	—	—	—	—	1,974	—
1,105	Elmstone Villa, Morpeth Street.	III.	—	—	—	—	—	—	—	—	1,975	—

I have thus attempted to give some idea of the course taken by this epidemic which can also be followed upon the series of maps that illustrate it.

It may be useful if, before referring to two subjects of much interest, viz., the invasion of the public elementary schools, and the comparison between the cases removed to hospital and those remaining at home, I can summarise the figures which are given under each of the 15 sections just described.

The cases known (to me) to have occurred during the whole period of 58 weeks, amount to 1,979, of which 23 arose in 1895, 56 in January, 1896, 145 in February, 604 in March, 733 in April, 283 in May, 122 in June, and 13 in July.*

The distribution of the infected houses during the whole period will be found to have been as follows:—

1. Kingsholm - -	51 houses, yielding	90 cases.
2. St. Nicholas - - -	45 „ „	64 „
3. South Hamlet - -	933 „ „	1,715 „
4. St. John Baptist - -	69 „ „	110 „
	1,098	1,979

There were 434 deaths.

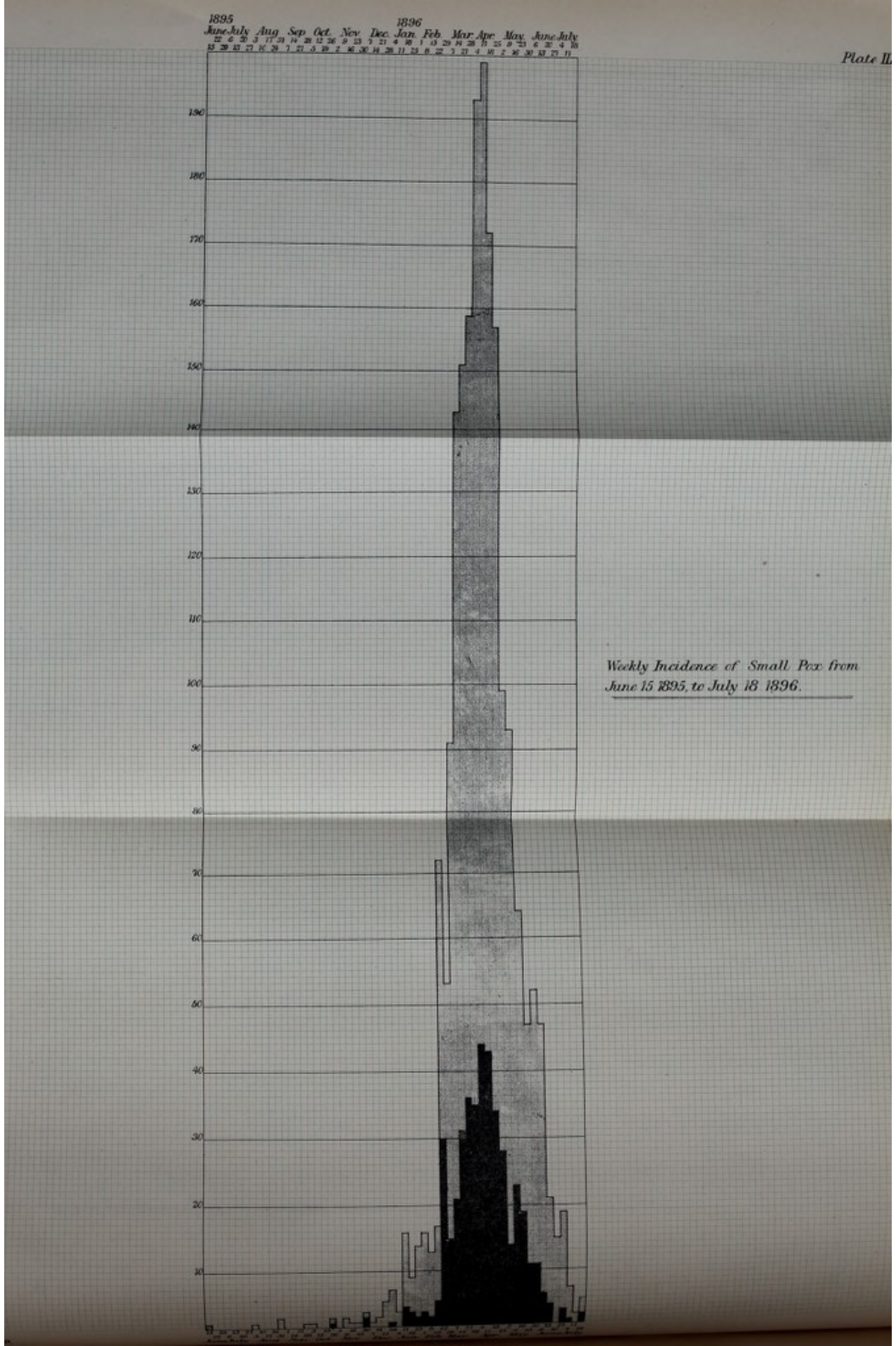
Distributed according to their *age*-incidence there were:—

1 month and under - -	22 cases,	21 deaths.
1 month to one year - -	63 „	40 „
1 to 10 years - - -	621 „	219 „
10 to 30 „ - - -	702 „	56 „
30 and over - - -	571 „	98 „
	1,979	434

These cases came from 1,098 houses, viz.:—

666	houses yielded each	1 case	= 666 cases.
226	„ „	2 cases	= 452 „
94	„ „	3 „	= 282 „
44	„ „	4 „	= 176 „
37	„ „	5 „	= 185 „
16	„ „	6 „	= 96 „
7	„ „	7 „	= 49 „
4	„ „	8 „	= 32 „
2	„ „	9 „	= 18 „
1	„ „	11 „	= 11 „
1	„ „	12 „	= 12 „
1,098			1,979

* Since the date (July 18th), at which this report closes, three other cases have occurred, none of them fatal. The last was notified on July 25th.



Weekly Incidence of Small Pox from June 15 1895, to July 18 1896.

Thus the proportion of households in which there was only a single case of small-pox to those in which there were two or more was as 666 : 432, or 1·5 : 1. The *deaths* occurred amongst members of 336 households, or more than one-fourth of those invaded, and in 66 of them more than 1 death occurred, viz., 44 with 2 deaths, 15 with 3 deaths, 5 with 4 deaths, 1 with 5 deaths, and 1 with 6 deaths.

The Table of Cases which follows has not been compiled in strict chronological order, and this for several reasons. It was drawn up and added to as fresh cases were notified, but cases were inserted which, on visiting the houses, were found to have escaped notification. Again, the order of notification does not strictly conform to the serial order of attacks, as sometimes notification was unduly delayed.

The preceding fortnightly lists of invaded houses were also prepared according to the order of notifications, and do not actually represent the order of their invasion; and, of course, the same applies to the maps.

Nor do I possess full data of the precise onset of illness of every person attacked. Such as I have obtained are given in the Table of Cases, and from them (using the date of appearance of the rash) I have prepared the following weekly list, employing the dates of notification when those of the rash were lacking (*see* Plate III).

TABLE OF WEEKLY INCIDENCE OF CASES OF SMALL-POX.

Week ending	Cases.	Deaths.	Week ending	Cases.	Deaths.
1895.			1896.		
June 15	1	—	January 4	3	—
„ 22	—	—	„ 11	16	4
„ 29	—	—	„ 18	9	3
July 6	—	—	„ 25	14	2
„ 13	—	—	February 1	16	3
„ 20	—	—	„ 8	13	2
„ 27	—	—	„ 15	17	5
August 3	1	—	„ 22	72	30
„ 10	—	—	„ 29	53	15
„ 17	—	—	March 7	91	21
„ 24	—	—	„ 14	143	31
„ 31	2	—	„ 21	151	36
September 7	—	—	„ 28	159	35
„ 14	—	—	April 4	193	44
„ 21	—	—	„ 11	199	43
„ 28	1	—	„ 18	172	34
October 5	1	—	„ 25	157	28
„ 12	—	—	May 2	99	14
„ 19	—	—	„ 9	93	23
„ 26	2	1	„ 16	64	19
November 2	—	—	„ 23	47	11
„ 9	2	—	„ 30	52	11
„ 16	1	—	June 7	47	6
„ 23	1	—	„ 14	21	4
„ 30	3	2	„ 21	15	—
December 7	1	—	„ 28	19	3
„ 14	2	—	July 4	7	1
„ 21	5	—	„ 11	2	—
„ 28	7	1	„ 18	5	2
				1,979	434

N.B.—In this table the "deaths" refer to those of persons who were attacked in the respective weeks, and not to the numbers registered weekly.

Table of Cases of Small-pox.

No.	Name and Notification Number.	Sex.	Age.	Date of Notification.	Date of Onset.	Date of Rash.	Date of Removal to Hospital.	Type of Attack.	Result.	Date of Death.	Vaccination. Date.	Vaccination. No. of Marks.	Re-vaccination Date.	Remarks.	No. in House Register.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
				1895.											
1	1324 J. P.	M.	30	June 15	—	—	June 15	Mild	Rec.	—	Infancy	—	—	——	1
2	1340 — M.	M.	24	Aug. 2	—	—	Aug. 2	Confluent	,,	—	?	—	—	In employ of Mr. B. of Midland Road, whose daughter had small-pox shortly before (not notified).	2
3	1349 W. S.	M.	20	,, 28	—	—	,, 28	Mild	,,	—	Inf.	—	—	——	3
4	1351 W. A. G.	M.	25	,, 30	—	—	,, 30	Mild	,,	—	Inf.	—	—	——	4
5	1362 E. G.	F.	16	Sept. 28	—	—	Sept. 28	Confluent	,,	—	Unvaccinated.		—	——	5
6	1364 — K.	F.	1	Oct. 1	—	—	Oct. 1	Confluent	,,	—	Unvaccinated.		—	——	6
7	1379 L. B.	F.	25	,, 23	—	—	,, 23	Confluent	,,	—	Inf.	—	—	——	7
8	— E. M.	F.	8	—	Oct. 21	Oct. 23	—	Malignant	D.	Oct. 27	Unvaccinated.		—	Notified as "malignant measles," attended Widden Street School; companion to sister of No. 5.	8
9	1383 K. M.	F.	17	Nov. 7	Nov. 5	Nov. 7	Nov. 7	Mild	Rec.	—	Inf.	—	—	——	8
10	1384 D. M.	F.	5	,, 7	,, 3	,, 4	,, 7	Confluent	,,	—	Unvaccinated.		—	——	8
11	1390 A. L. M.	F.	30	,, 12	—	—	,, 12	Mild	,,	—	Inf.	—	—	——	9
12	1392 J. M.	M.	40	,, 20	Nov. 19	Nov. 20	,, 20	Discrete	,,	—	Inf.	—	—	——	8
13	1398 A. K. W.	F.	17	,, 27	—	—	,, 27	Confluent	D.	Dec. 12	Unvaccinated.		—	——	10
14	1399 K. G.	M.	4	,, 29	—	—	,, 29	Confluent	D.	,, 25	Unvaccinated.		—	Contracted in hospital	11
15	1400 F. G.	F.	15	,, 29	—	—	,, 29	Mild	Rec.	—	Inf.	—	—	——	12
16	1406 E. L.	F.	14	Dec. 8	—	—	Dec. 8	Mild	,,	—	Inf.	—	—	——	13
17	1409 C. W.	F.	19	,, 12	—	—	,, 12	Mild	,,	—	Inf.	—	—	——	10
18	1416 J. N.	M.	42	,, 18	—	—	,, 18	Mild	,,	—	Inf.	—	—	——	14
19	1417 F. S.	M.	7	,, 20	—	—	,, 20	Confluent	,,	—	Unvaccinated.		—	——	15
20	1418 K. H.	F.	24	,, 21	—	—	,, 21	Mild	,,	—	Inf.	—	—	——	16
21	1419 A. H.	F.	19	,, 22	Nov. 21	Nov. 22	,, 22	Discrete	,,	—	Inf.	—	—	——	17
22	1420 K. B.	F.	25	,, 23	—	—	,, 23	Mild	,,	—	Inf.	—	—	——	18
23	1421 J. H.	F.	1/12	,, 23	—	—	—	Confluent	D.	Dec. 24	Unvaccinated.		—	——	19
24	1422 E. B.	M.	23	,, 24	—	—	Dec. 24	Discrete	Rec.	—	Inf.	—	—	——	20
25	1423 F. W.	F.	12	,, 25	—	—	,, 25	Confluent	,,	—	Unvaccinated.		—	——	21
26	1425 J. M.*	F.	40	,, 26	Nov. 24	Nov. 26	,, 26	Discrete	,,	—	Inf.	—	—	——	22
27	1426 J. N. V.	M.	25	,, 27	—	—	,, 27	Mild	,,	—	Inf.	—	—	——	23
				1896.											
28	1428 A. H	F.	14	Jan. 1	Nov. 30	—	Jan. 1	Mild	,,	—	Inf.	—	—	——	17
29	— A. H.	F.	2	—	Early in Dec.		—	Mild	,,	—	Unvaccinated.		—	——	19
30	— R. H.	F.	21	—	About Dec. 20.		—	Mild	,,	—	Inf.	—	—	——	19
31	— A. L.	M.	18	—	,,	,,	—	Mild	,,	—	Inf.	—	—	——	19
32	1429 H. S.	M.	29	Jan. 4	—	—	Jan. 4	Discrete	,,	—	Inf.	—	—	——	24
33	1430 J. H.	F.	26	,, 4	—	—	,, 4	Discrete	,,	—	Inf.	—	—	——	25
34	1431 S. W.	M.	8	,, 6	—	—	,, 6	Confluent	,,	—	Unvaccinated.		—	——	21

35	1432	F. W.	M.	6	Jan. 6	—	—	Jan. 6	Confluent	„	—	Unvaccinated	—			21
36	1433	W. W.	M.	16	„ 7	—	—	„ 7	Confluent	„	—	Unvaccinated	—			21
37	1434	A. A.	F.	44	„ 7	Jan. 1	Jan. 4	„ 7	Confluent	D.	Jan. 16	Inf. —	—			26
38	1435	M. C.	F.	7	„ 8	„ 6	„ 8	„ 8	Confluent	Rec.	—	Unvaccinated	—			27
39	1436	W. W.	F.	47	„ 8	—	—	„ 8	Mild	„	—	Inf. —	—			21
40	1437	E. M.	F.	23	„ 8	—	—	„ 8	Mild	„	—	Inf. —	—			28
41	1438	J. L.	F.	37	„ 9	—	—	„ 9	Confluent	D.	Jan. 13	Inf. —	—			29
42	1439	F. L.	F.	8	„ 9	—	—	„ 9	Confluent	Rec.	—	Unvaccinated	—			29
43	1440	A. M.	M.	$1\frac{6}{12}$	„ 10	—	—	„ 10	Confluent	„	—	Unvaccinated	—			36
44	1441	W. H.	M.	3	„ 10	Jan. 7	Jan. 9	„ 10	Mild	„	—	Unvaccinated	—			16
45	1442	F. B.	F.	18	„ 11	„ 9	„ 11	„ 11	Mild	„	—	Inf. —	—			30
46	1443	F. H.	M.	$\frac{7}{12}$	„ 11	—	—	„ 11	Confluent	D.	Jan. 18	Unvaccinated	—			31
47	1444	N. H.	F.	3	„ 11	—	—	„ 11	Confluent	Rec.	—	Unvaccinated	—			31
48	1445	G. C.	M.	8	„ 11	—	—	„ 11	Confluent	D.	Jan. 15	Unvaccinated	—			32
49	1446	W. McK.	M.	48	„ 11	—	—	—	Confluent	Rec.	—	Unvaccinated	—			33
50	1447	G. C.	F.	4	„ 13	—	—	Jan. 13	Confluent	„	—	Unvaccinated	—			32
51	1448	W. H.	M.	5	„ 13	—	—	„ 13	Confluent	„	—	Unvaccinated	—			31
52	1449	J. T.	M.	17	„ 14	—	—	„ 14	Discrete	„	—	Inf. —	—			35
53	1450	J. S.	F.	3	„ 15	—	—	„ 15	Confluent	„	—	Unvaccinated	—			15
54	1451	F. T.	M.	32	„ 15	Jan. 12	Jan. 14	„ 15	Confluent	„	—	Inf. —	—			37
55	1452	L. V.	M.	2	„ 15	—	—	„ 15	Confluent	D.	Jan. 19	Unvaccinated	—			23
56	1453	H. L.	M.	31	„ 16	—	—	„ 16	Confluent	D.	„ 22	Inf. —	—			38
57	1454	A. T.	M.	1	„ 12	—	—	„ 12	Confluent	D.	„ 16	Unvaccinated	—			34
58	1455	E. C.	F.	5	„ 18	—	—	„ 18	Discrete	Rec.	—	Unvaccinated	—			39
59	1456	H. K.	M.	20	„ 20	—	—	„ 20	Mild	„	—	Inf. —	—			40
60	1457	A. P.	M.	17	„ 21	—	—	„ 21	Discrete	„	—	Inf. —	—	Son of A. P., aged 50, who was attacked with small-pox, and case notified (No. 1,463) from the ship "Hero." Not included in this Return at first, but has since been inserted (*see* No. 1,977, *infra*).		41
61	1458	H. L.	M.	16	„ 21	—	—	„ 21	Mild	„	—	Inf. —	—			29
62	1459	S. M.	M.	$\frac{10}{12}$	„ 22	—	—	„ 22	Confluent	D.	Jan. 26	Unvaccinated	—			36
63	1460	M. M.	F.	31	„ 22	—	—	„ 22	Discrete	Rec.	—	Inf. —	—			36
64	1461	G. M.	M.	36	„ 22	—	—	„ 22	Confluent	„	—	Alleged: no marks	—			36
65	1462	W. M.	M.	4	„ 22	—	—	„ 22	Confluent	„	—	Unvaccinated	—			36
66	1464	W. J.	M.	43	„ 24	Jan. 22	Jan. 24	„ 25	Discrete	„	—	Inf. 2 faint	—			42
67	1465	C. B.	F.	36	„ 25	„ 23	„ 25	„ 26	Mild	„	—	Inf. 2 faint	—			7
68	1466	F. T.	M.	3	„ 25	„ 22	„ 24	„ 26	Confluent	„	—	Unvaccinated	—			34
69	1467	D. T.	F.	3	„ 25	„ 22	„ 24	„ 26	Confluent	„	—	Unvaccinated	—			34
70	1468	W. T.	M.	8	„ 25	„ 22	„ 24	„ 26	Mild	„	—	Recent, 4 vesicles abt. 7 days	—	Remains of lupus on neck and limbs.		34
71	1470	E. B.	F.	6	„ 26	„ 23	„ 25	„ 26	Malignant	D.	Jan. 28	Unvaccinated	—			30
72	1471	J. C.	M.	17	„ 27	„ 24	„ 26	„ 28	Discrete	Rec.	—	Inf. 4 plain	—			43
73	1472	W. K.	M.	35	„ 28	„ 25	„ 27	„ 28	Confluent	„	—	Inf. 2 plain	—			44
74	1473	E. W.	F.	46	„ 29	„ 27	„ 29	„ 29	Malignant	D.	Feb. 4	Inf. 2 plain	—			45
75	1474	A. C.	M.	4	„ 30	„ 27	„ 29	„ 30	Confluent	Rec.	—	Unvaccinated	—	Abscess on eyelid		39
76	1477	F. S.	M.	38	„ 31	„ 28	„ 30	„ 31	Confluent	D.	Feb. 7	Inf. 1 indistinct scar.	—	Severe delirium		46
77	1478	G. S.	M.	24	„ 31	„ 29	„ 31	„ 31	Mild	Rec.	—	Inf. 3 faint	—			40
78	1479	G. P.	F.	37	„ 31	„ 29	„ 31	Feb. 1	Confluent	„	—	Inf. 2 faint	—			47
79	1480	G. T.	M.	7	Feb. 1	„ 29	„ 31	„ 1	Discrete	„	—	Unvaccinated	—			35
80	1481	L. B.	F.	2	„ 1	„ 30	Feb. 1	„ 1	Confluent	„	—	Unvaccinated	—	Delirium		48

* Committed suicide three days after return home.

No.	Name and Notification Number.	Sex.	Age.	Date of Notification.	Date of Onset.	Date of Rash.	Date of Removal to Hospital.	Type of Attack.	Result.	Date of Death.	Vaccination. Date.	Vaccination. No. of Marks.	Re-vaccination Date.	Remarks.	No. in House Register.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
				1896.											
81	1482 M. T.	F.	53	Feb. 1	Jan. 28	Jan. 30	Feb. 1	Coherent	Rec.	—	Inf.	3 faint	—	—	49
82	1483 M. S.	F.	19	„ 2	„ 30	Feb. 1	„ 2	Mild	„	—	Inf.	4 plain, large.	2 years ago	Pregnant 4½ months. [Child subsequently born alive.]	50
83	1484 F. G. E.	M.	32	„ 3	Feb. 1	„ 3	„ 4	Mild	„	—	Inf.	1 faint	—	—	51
84	1485 A. P.	F.	12	„ 3	„ 2	„ 4	„ 4	Mild	„	—	Inf.	4 plain	Attempted 3 days before admission; no result.	Sister of No. 60	41
85	1486 B. S.	F.	20	„ 3	Jan. 29	Jan. 31	„ 3	Discrete	„	—	Inf.	4 plain	—	—	52
86	1487 S M.	F.	49	„ 3	Feb. 1	Feb. 3	„ 4	Malignant	D.	Feb. 26	Inf.	3 plain	20 years ago, but did not take; 2 attempts.	Pulmonary hæmorrage	53
87	1488 G. P.	F.	9	„ 3	„ 1	„ 3	—	Confluent	Rec.	—	Unvaccinated		—	—	54
88	1489 G. E. O.	M.	23	„ 3	„ 1	„ 3	—	Mild	„	—	Inf.	—	—	—	55
89	1490 B. W.	F.	9	„ 4	„ 1	„ 3	Feb. 4	Confluent	„	—	Unvaccinated		—	—	56
90	1491 R. M.	F.	38	„ 4	Jan. 30	„ 1	„ 4	Confluent	D.	Feb. 10	Inf.	3 very faint.	—	Severe delirium	57
91	1492 R. B.	M.	34	„ 4	„ 31	„ 2	„ 5	Confluent	Rec.	—	Inf.	2 faint	—	Severe delirium. Abscess on arm.	58
92	1493 M. A. M'C.	F.	25	„ 4	Feb. 1	„ 3	„ 5	Discrete	„	—	Inf.	3 plain	—	—	59
93	1494 M. L.	F.	53	„ 5	„ 2	„ 4	„ 5	Mild	„	—	Inf.	3 faint	In youth	—	60
94	1495 — S.	F.	36	„ 5	—	—	—	Mild	„	—	Inf.	—	—	—	62
95	1496 F. T. C.	M.	13	„ 7	Feb. 3	Feb. 5	Feb. 7	Confluent	„	—	Unvaccinated		—	—	63
96	1497 H. M.	M.	7	„ 7	„ 2	„ 4	„ 7	Confluent	„	—	Unvaccinated		—	—	64
97	1498 A. S.	F.	25	„ 4	Jan. 29	Jan. 31	„ 4	Mild	„	—	Inf.	4 faint	—	—	61
98	1500 N. S.	F.	7	„ 8	Feb. 4	Feb. 6	„ 8	Confluent	D.	Feb. 16	Unvaccinated		—	—	65
99	1501 M. J. B.	F.	33	„ 8	„ 3	„ 6	„ 8	Coherent	Rec.	—	Inf.	3 faint	—	—	66
100	1502 C. J. B.	M.	43	„ 8	„ 6	„ 8	„ 9	Confluent	„	—	Inf.	3 plain	—	—	67
101	1503 S. W.	M.	11	„ 9	„ 7	„ 9	„ 9	Confluent	D.	Feb. 15	Unvaccinated		—	—	56
102	1505 R. P.	F.	5	„ 13	„ 11	„ 13	„ 13	Confluent	D.	„ 22	Unvaccinated		—	—	47
103	1506 W. H. H.	M.	34	„ 13	„ 9	„ 11	„ 13	Confluent	Rec.	—	Inf.	4 plain	—	—	68
104	1508 G. S.	F.	3/12	„ 14	„ 11	„ 13	„ 14	Confluent	„	—	Unvaccinated		—	—	61
105	1509 A. W.	F.	6	„ 14	„ 12	„ 14	„ 15	Coherent	„	—	Unvaccinated		—	—	69
106	1510 M. W.	F.	3	„ 14	„ 12	„ 14	„ 15	Coherent	„	—	Unvaccinated		—	—	69
107	1511 A. H.	M.	5	„ 15	„ 12	„ 14	„ 15	Confluent	„	—	Unvaccinated		—	—	70
108	1512 H. P.	M.	4/12	„ 15	„ 12	„ 14	„ 16	Discrete	„	—	Unvaccinated		—	—	47
109	1513 A. J. M.	M.	20	„ 15	„ 12	„ 14	„ 16	Confluent	D.	Feb. 23	Unvaccinated		—	Mother prevented successful vaccination immediately after it was attempted in infancy.	71
110	1514 E. W.	F.	20	„ 16	„ 12	„ 14	„ 16	Discrete	Rec.	—	Inf.	4 faint	—	—	72
111	1515 H. H.	M.	24	„ 16	„ 12	„ 14	„ 16	Discrete	—	—	Inf.	3 faint	—	—	73
112	1516 W. H.	M.	3	„ 16	„ 14	„ 16	„ 16	Confluent	D.	Feb. 22	Unvaccinated		—	—	74
113	1517 A. S.	M.	6	„ 16	„ 13	„ 15	„ 17	Confluent	D.	„ 21	Unvaccinated		—	—	75

114	1518	F. P.	M.	10wks.	„	16	„	7	„	9	„	17	Confluent	D.		19	Unvaccinated	—	76
115	1519	R. W.	F.	$1\frac{2}{12}$	„	16	„	14	„	16	—		Discrete	Rec.	—		Unvaccinated	—	69
116	1520	F. M.	M.	5	„	16	„	14	„	16	Feb.	17	Confluent	D.	Feb.	26	Unvaccinated	—	77
117	1521	W. E.	M.	4	„	17	„	14	„	16	„	17	Confluent	Rec.	—		Unvaccinated	—	78
118	1522	E. K.	F.	28	„	17	„	12	„	14	„	17	Confluent	„	—		Unvaccinated	—	79
119	1523	L. D.	F.	5	„	17	„	15	„	17	„	17	Confluent	„	—		Unvaccinated	—	80
120	1524	A. H.	F.	5	„	17	„	15	„	17	„	17	Confluent	D.	Mar.	1	Unvaccinated	—	81
121	1525	W. H. A.	M.	5	„	17	„	14	„	16	„	18	Mild	Rec.	—		Unvaccinated	—	82
122	1526	A. T.	M.	5	„	17	„	14	„	16	„	18	Discrete	„	—		Unvaccinated	—	83
123	1527	A. O.	M.	6	„	17	„	15	„	17	„	18	Confluent	„	—		Unvaccinated	—	84
124	1528	W. C.	M.	5	„	17	„	14	„	16	„	18	Confluent	D.	Feb.	23	Unvaccinated	—	85
125	1529	G. D. J.	M.	6	„	18	„	14	„	16	„	19	Discrete	Rec.	—		Unvaccinated	—	86
126	1530	H. McC.	F.	19	„	18	„	15	„	17	„	19	Discrete	„	—		Inf. | 4 plain	—	59
127	1531	W. P.	M.	32	„	18	„	15	„	17	„	18	Confluent	„	—		Inf. | 4 faint	—	47
128	1532	R. T.	M.	7	„	18	„	13	„	15	—		Mild	„	—		Unvaccinated	—	87
129	1533	L. T.	M.	5	„	18	„	13	„	15	—		Mild	„	—		Unvaccinated	—	87
130	1534	C. M.	M.	6	„	18	„	14	„	18	—		Confluent	„	—		Unvaccinated	—	88
131	1535	A. N.	F.	6	„	19	„	14	„	16	„	20	Coherent	„	—		Unvaccinated	—	89
132	1536	C. L.	F.	5	„	19	„	17	„	19	„	20	Confluent	D.	Feb.	28	Unvaccinated	—	90
133	1537	O. N.	M.	3	„	19	„	14	„	16	„	20	Coherent	Rec.	—		Unvaccinated	—	89
134	1538	E. C.	M.	6	„	19	„	17	„	19	„	20	Confluent	D.	Feb.	24	Unvaccinated	—	91
135	1539	F. B.	F.	6	„	19	„	16	„	18	„	20	Confluent	D.	„	26	Unvaccinated	—	94
136	1540	E. H.	F.	29	„	19	„	14	„	16	„	27	Discrete	Rec.	—		Inf. | 3 plain	—	92
137	1541	A. G.	F.	14	„	19	„	19	„	19	„	19	Mild	„	—		Inf. | 3 plain	—	93
138	1542	W. W.	M.	5	„	19	„	16	„	18	„	19	Confluent	„	—		Unvaccinated	—	95
139	1543	A. A.	M.	4	„	19	„	17	„	19	„	19	Confluent	D.	Mar.	20	Unvaccinated	—	96
140	1544	M. P.	F.	40	„	19	„	17	„	19	—		Coherent	Rec.	—		Inf. | —	Once	54
141	1545	E. B.	F.	25	„	19	„	17	„	19	—		Mild	„	—		Inf. | —	—	54
142	1546	E. B.	F.	6	„	19	„	8	„	10	Feb.	20	Confluent	„	—		Unvaccinated	—	97
143	1547	C. W.	F.	37	„	20	„	17	„	19	—		Mild	„	—		Inf. | —	—	69
144	1548	B. S.	F.	5	„	20	„	14	„	16	Feb.	20	Confluent	„	—		Unvaccinated	—	98
145	1549	S. A.	M.	5	„	20	„	18	„	20	„	20	Discrete	„	—		Unvaccinated	—	99
146	1550	W. K.	M.	5	„	20	„	15	„	17	„	21	Confluent	D.	Feb.	26	Unvaccinated	—	100
147	1551	S. H.	M.	8	„	20	„	16	„	18	„	21	Confluent	D.	„	29	Unvaccinated	—	101
148	1552	C. T.	M.	5	„	20	„	16	„	18	—		Confluent	Rec.	—		Unvaccinated	—	102
149	1553	C. T.	F.	69	„	20	„	18	„	20	Feb.	21	Mild	„	—		Inf. | 3 faint	—	103
150	1554	L. G.	M.	21	„	20	„	14	„	16	—		Malignant	D.	Feb.	21	Aged 7yrs. | —	—	104
151	1555	G. B.	F.	5	„	20	„	18	„	20	Feb.	22	Confluent	D.	April	20	Unvaccinated	—	105
152	—	E. B.	F.	8	—		Mar.	8	Mar.	10	Mar.	11	Confluent	Rec.	—		Unvaccinated	—	105
153	1556	J. H.	M.	3	Feb.	20	Feb.	14	Feb.	16	„	21	Confluent	D.	Feb.	23	Unvaccinated	—	106
154	1557	G. W.	M.	28	„	21	„	18	„	20	—		Mild	Rec.	—		Inf. | —	—	107
155	1558	J. J.	M.	5	„	21	„	17	„	19	Mar.	22	Confluent	D.	Mar.	5	Unvaccinated	—	108
156	1559	V. E. H.	M.	7	„	21	„	16	„	19	„	22	Confluent	D.	„	3	Unvaccinated	—	109
157	1560	A. C.	F.	6	„	21	„	14	„	16	„	22	Confluent	Rec.	—		Unvaccinated	—	110
158	1561	E. B.	F.	6	„	21	„	14	„	16	„	21	Confluent	„	—		Unvaccinated	—	111
159	1562	W. R. T.	M.	5	„	21	„	17	„	19	„	22	Confluent	D.	Feb.	26	Unvaccinated	—	113
160	1563	W. A. W.	M.	26	„	21	„	19	„	20	„	26	Confluent	Rec.	—		Inf. | 3 plain	—	112
161	1564	M. H.	F.	6	„	21	„	19	„	21	„	21	Confluent	D.	Mar.	6	Unvaccinated	—	114
162	1565	A. G.	F.	5	„	21	„	18	„	20	„	21	Confluent	D.	Feb.	23	Unvaccinated	—	115
163	1566	P. M.	M.	4	„	21	„	17	„	19	„	22	Confluent	Rec.	—		Unvaccinated	—	116
164	1567	D. P.	F.	5	„	22	„	16	„	18	—		Confluent	„	—		Unvaccinated	—	117
165	1568	R. P.	M.	5	„	22	„	18	„	20	„	23	Confluent	„	—		Unvaccinated	—	118

A doubtful case. No premonitory symptoms. Scanty eruption. Varicella ?

Delirium

No.	Name and Notification Number.	Sex.	Age.	Date of Notification.	Date of Onset.	Date of Rash.	Date of Removal to Hospital.	Type of Attack.	Result.	Date of Death.	Vaccination. Date.	Vaccination. No. of Marks.	Re-vaccination Date.	Remarks.	No. in House Register.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
				1896.											
166	1569 W. R.	M.	5	Feb. 22	Feb. 17	Feb. 19	Feb. 23	Confluent	D.	Mar. 2	Unvaccinated		—		119
167	1570 W. E. J. A.	M.	5	„ 22	„ 17	„ 19	„ 24	Confluent	Rec.	—	Unvaccinated		—		120
168	1571 H. D.	M.	46	„ 22	„ 19	„ 21	„ 23	Confluent	„	—	Inf.	3 plain	—		121
169	1572 G. B.	M.	24	„ 22	„ 15	„ 17	„ 23	Mild	„	—	Inf.	2 plain	—		122
170	1573 E. B.	M.	30	„ 22	„ 14	„ 16	—	Mild	„	—	Inf.	—	—		66
171	1574 H. S.	M.	5	„ 22	„ 18	„ 20	Feb. 24	Discrete	„	—	Unvaccinated		—		123
172	1575 E. H.	F.	72	„ 23	—	—	—	Confluent	D.	Feb. 29	Inf.	—	—		124
173	1577 F. W.	M.	9	„ 24	Feb. 19	Feb. 21	Feb. 24	Confluent	Rec.	—	Unvaccinated		—		26
174	1578 L. K.	F.	5	„ 24	„ 19	„ 21	„ 25	Confluent	D.	Feb. 28	Unvaccinated		—		125
175	1579 E. S.	F.	50	„ 24	„ 22	„ 24	„ 26	Discrete	Rec.	—	Inf.	3 plain	—		65
176	1580 C. W.	F.	5	„ 24	„ 19	„ 21	„ 27	Confluent	D.	Mar. 1	Unvaccinated		—		126
177	1581 W. L.	M.	56	„ 24	„ 19	„ 21	„ 24	Discrete	Rec.	—	Inf.	3 faint	—		60
178	1582 W. H.	M.	6	„ 24	„ 20	„ 22	„ 25	Confluent	D.	Mar. 1	Unvaccinated		—		127
179	1583 J. T.	M.	37	„ 24	„ 21	„ 23	„ 25	Mild	Rec.	—	Inf.	2 plain	—		128
180	1584 W. B.	M.	9	„ 25	„ 22	„ 24	„ 26	Discrete	„	—	Unvaccinated		—		58
181	1585 H. S.	M.	3	„ 25	„ 23	„ 25	Mar. 1	Confluent	„	—	Unvaccinated		—		129
182	1586 A. H.	F.	3	„ 25	„ 23	„ 25	Feb. 28	Coherent	„	—	Unvaccinated		—		130
183	1587 T. R.	M.	6	„ 25	„ 23	„ 25	„ 26	Confluent	„	—	Unvaccinated		—		131
184	1588 N. B.	F.	7	„ 25	„ 23	„ 25	„ 26	Confluent	„	—	Unvaccinated		—		58
185	1589 O. B.	M.	4	„ 25	„ 19	„ 21	„ 26	Confluent	„	—	Unvaccinated		—		132
186	1590 F. B.	F.	3	„ 25	„ 19	„ 21	„ 26	Confluent	D.	Mar. 2	Unvaccinated		—		133
187	1591 E. L.	F.	17	„ 25	—	—	—	Discrete	Rec.	—	Inf.	—	—		134
188	1592 F. B.	F.	4	„ 26	Feb. 19	Feb. 21	Feb. 26	Confluent	D.	Mar. 1	Unvaccinated		—		135
189	1593 T. R.	M.	5	„ 26	„ 20	„ 22	„ 27	Confluent	D.	„ 3	Unvaccinated		—		136
190	1594 E. R.	F.	5	„ 26	„ 20	„ 22	—	Confluent	D.	„ 5	Unvaccinated		—		137
191	1595 R. W.	M.	4	„ 26	„ 23	„ 25	„ 26	Coherent	Rec.	—	Unvaccinated		—		138
192	1596 W. H.	M.	5	„ 26	„ 24	„ 26	„ 27	Confluent	D.	Mar. 10	Unvaccinated		—		139
193	1597 R. N.	F.	4	„ 26	„ 18	„ 20	„ 27	Confluent	D.	„ 1	Unvaccinated		—		140
194	1598 E. G.	M.	3	„ 27	„ 24	„ 26	„ 27	Confluent	D.	„ 15	Unvaccinated		—		142
195	1599 W. S.	M.	3	„ 27	„ 22	„ 25	—	Coherent	Rec.	—	Unvaccinated		—		143
196	1600 W. W.	M.	3	„ 27	„ 23	„ 25	Feb. 27	Confluent	„	—	Unvaccinated		—		112
197	1601 L. B.	F.	5	„ 26	„ 19	„ 21	„ 26	Confluent	D.	Mar. 2	Unvaccinated		—		141
198	1602 W. C.	M.	4	„ 27	„ 21	„ 23	„ 27	Confluent	D.	„ 2	Unvaccinated		—		144
199	1603 G. C.	F.	16	„ 27	„ 21	„ 23	„ 27	Mild	Rec.	—	Inf.	2 plain	—		145
200	1604 A. C.	M.	5	„ 27	„ 20	„ 22	„ 27	Confluent	„	—	Unvaccinated		—		146
201	1605 E. C.	F.	4	„ 27	„ 22	„ 24	„ 27	Confluent	D.	Mar. 6	8 days before admission.		—		145
202	1606 M. B.	M.	3	„ 27	„ 23	„ 26	—	Confluent	Rec.	—	Unvaccinated		—		147
203	1607 W. W.	M.	15	„ 28	„ 14	„ 16	—	Discrete	„	—	Inf.	—	—		148
204	1608 A. C.	F.	5	„ 28	„ 25	„ 27	Feb. 28	Confluent	D.	Mar. 7	Unvaccinated		—		149
205	1610 C. C.	F.	6	„ 28	„ 23	„ 25	—	Confluent	Rec.	—	Unvaccinated		—		150
206	1611 A. G.	M.	4	„ 28	„ 26	„ 28	Feb. 29	Confluent	D.	Mar. 2	Unvaccinated		—		151
207	1612 S. A.	M.	6	„ 28	„ 21	„ 23	„ 28	Confluent	D.	„ 6	Unvaccinated		—		152
208	1613 M. S.	F.	3	„ 28	„ 25	„ 27	„ 29	Confluent	Rec.	—	Unvaccinated		—		153

209	1614	A. N.	F.	78	"	28	"	26	"	28	—	Discrete	"	—	Inf.	—	—		154
210	1615	M. W.	F.	26	"	28	"	20	"	22	Feb. 29	Mild	"	—	Inf.	3 plain, 1 faint.	—		112
211	1616	L. S.	F.	5	"	28	"	25	"	27	" 29	Discrete	"	—	Unvaccinated		—		155
212	1617	F. E.	F.	4	"	28	"	24	"	26	" 29	Confluent	D.	Mar. 5	Unvaccinated		—		156
213	1618	F. T.	M.	30	"	28	"	26	"	28	—	Mild	Rec.	—	Inf.	—	—		157
214	1619	S. A. P.	F.	40	"	29	"	23	"	25	Feb. 29	Mild	"	—	Inf.	2 plain	—		158
215	1620	L. C.	F.	6	"	29	"	22	"	24	Mar. 1	Confluent	D.	Mar. 3	Unvaccinated		—		159
216	1621	E. T.	F.	26	"	29	"	22	"	24	Feb. 24	Discrete	Rec.	—	Inf.	3 plain	—		83
217	—	E. K. T.	F.	3	—		"	24	"	29	" 29	Discrete	"	—	About 5 days before admission.		—	No pustules	83
218	1622	W. R.	M.	8	Feb.	29	"	16	"	21	—	Confluent	"	—	Unvaccinated		—		160
219	1623	E. W.	F.	4	"	29	"	26	"	28	Mar. 1	Confluent	D.	Mar. 7	Unvaccinated		—		161
220	1624	A. H. M.	M.	3	"	29	"	25	"	27	" 1	Coherent	Rec.	—	Unvaccinated		—		162
221	1625	J. C.	M.	2	"	29	"	27	"	29	" 1	Confluent	D.	Mar. 6	Unvaccinated		—		163
222	—	W. C.	M.	4	—		"	14	"	16	Feb. 17	Confluent	D.	Feb. 24	Unvaccinated		—		163
223	1626	G. M.	M.	28	Feb.	29	"	25	"	27	Mar. 1	Mild	Rec.	—	Inf	2 faint	Attempts; 14 days and 8 days before; no result.		164
224	1627	H. E.	M.	1	Mar.	1	"	27	"	29	" 1	Confluent	"	—	Unvaccinated		—		78
225	1628	I. H.	F.	4	"	1	"	25	"	27	" 3	Confluent	D.	Mar. 8	Unvaccinated		—		165
226	1629	J. H.	F.	6	"	1	"	25	"	27	" 3	Confluent	Rec.	—	Unvaccinated		—		165
227	1630	C. A. J.	M.	23	"	1	"	25	"	27	" 1	Confluent	"	—	Inf.	4 faint	—		166
228	1631	M. H.	F.	13	"	1	"	28	Mar.	1 —		Confluent	"	—	Inf.	—	—		167
229	1632	M. S.	F.	4	"	2	"	27	"	29	Mar. 2	Confluent	"	—	Unvaccinated		—		168
230	1633	H. A.	F.	6	"	2	"	28	"	1	" 2	Confluent	"	—	Unvaccinated		—	Severe delirium	96
231	1634	J. P.	M.	37	"	2	"	29	"	2	" 4	Confluent	"	—	Inf.	3 faint	—		76
232	1635	S. A.	M.	2	"	2	"	23	Feb.	25	" 2	Confluent	D.	Mar. 7	Unvaccinated		—		82
233	1637	J. G.	M.	11	"	2	"	28	Mar.	1 —		Confluent	Rec.	—	Unvaccinated		—		169
234	1638	C. B.	F.	4	"	2	"	23	Feb.	25	Mar. 3	Confluent	D.	Mar. 8	Unvaccinated		—		94
235	1639	V. B.	M.	11	"	2	—		—		—	Mild	Rec.	—	Inf.	—	—		94
236	1640	M. B.	F.	42	"	2	Feb.	23	Feb.	25	Mar. 3	Confluent	"	—	Inf.	4 faint	—		94
237	1641	E. N.	F.	4	"	2	"	27	"	29	" 3	Confluent	"	—	Unvaccinated		—		170
238	1645	F. K.	M.	34	"	3	"	26	"	28	" 3	Coherent	"	—	Inf.	4 plain	—		77
239	1646	G. P.	M.	43	"	3	"	29	Mar.	2	" 4	Confluent	D.	Mar. 16	Inf.	3 faint	—	Delirium	76
240	1647	L. H.	M.	7	"	3	Mar.	1	"	3	" 5	Mild	Rec.	—	Unvaccinated		—		171
241	1648	E. S.	F.	42	"	3	Feb.	28	"	1	" 4	Confluent	"	—	Unvaccinated		—	Vaccination failed Feb. 22	98
242	1649	R. J. S.	M.	7	"	3	"	28	"	1	" 4	Confluent	"	—	Unvaccinated		—	Vaccination failed Feb. 22. Abscesses followed small-pox.	98
243	1650	C. P.	F.	31	"	4	Mar.	1	"	3	—	Discrete	"	—	Inf.	No marks	—		117
244	1651	E. C.	F.	14	"	4	"	1	"	3	Mar. 5	Mild	"	—	Inf.	3 plain	—		172
245	1652	K. A.	F.	6	"	4	Feb.	29	"	2	" 5	Confluent	"	—	Unvaccinated		—		99
246	1653	E. B.	F.	56	"	4	"	29	"	2	" 5	Mild	"	—	Inf.	3 plain	42 years ago		99
247	1654	A. N.	F.	29	"	4	"	28	"	1	" 5	Mild	"	—	Inf.	3 plain	—		89
248	1655	P. E. W.	M.	7	"	4	"	29	"	2	" 5	Confluent	"	—	Unvaccinated		—		173
249	1656	S. G.	M.	12	"	4	Mar.	1	"	3	" 5	Confluent	"	—	Unvaccinated		—		174
250	1657	E. V.	F.	7	"	4	"	1	"	3	" 7	Confluent	"	—	Unvaccinated		—		175
251	1658	A. W.	M.	14	"	4	"	2	"	4	" 5	Mild	"	—	Inf.	2 plain	—		176
252	1659	M. H.	F.	32	"	4	"	2	"	4	—	Confluent	"	—	Inf.	—	—		177
253	1660	L. L.	F.	36	"	4	"	1	"	3	Mar. 5	Confluent	D.	Mar. 21	Inf.	2 plain	—	Acute mania	178
254	1661	A. S.	M.	31	"	4	Feb.	28	"	1	" 5	Discrete	Rec.	—	Inf.	4 plain	—		179
255	1662	M. H.	F.	3	"	5	"	27	Feb.	29	" 5	Confluent	D.	Mar. 8	Unvaccinated		—		109
256	1663	A. J. H.	M.	7	"	5	"	27	"	29	" 5	Confluent	Rec.	—	Unvaccinated		—		109

No.	Name and Notification Number.	Sex.	Age.	Date of Notification.	Date of Onset.	Date of Rash.	Date of Removal to Hospital.	Type of Attack.	Result.	Date of Death.	Vaccination. Date.	Vaccination. No. of Marks.	Re-vaccination Date.	Remarks.	No. in House Register.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
				1896.											
257	1664 T. S.	M.	10	Mar. 5	Mar. 3	Mar. 5	Mar. 5	Mild	Rec.	—	Inf.	4 plain	—	——	98
258	1665 M. S.	F.	3	„ 5	„ 3	„ 5	„ 5	Confluent	D.	Mar. 30	Unvaccinated		—	Vaccination failed, Feb. 27	98
259	1666 S. B.	M.	15	„ 5	„ 1	„ 3	„ 5	Mild	Rec.	—	Inf.	4 plain	—	——	94
260	1667 C. B.	M.	13	„ 5	„ 1	„ 3	„ 5	Mild	„	—	Inf.	3 plain	—	——	94
261	1668 R. H.	M.	7	„ 5	Feb. 28	„ 1	„ 7	Confluent	D.	Mar. 10	Unvaccinated		—	——	101
262	1669 A. H.	M.	10	„ 5	„ 28	„ 1	„ 7	Mild	Rec.	—	7 days before admission.		—	——	101
263	1670 E. H.	F.	4	„ 5	„ 28	„ 1	„ 7	Confluent	D.	Mar. 12	7 days before admission.		—	——	101
264	1671 H. P.	M.	24	„ 5	Mar. 3	„ 5	„ 9	Confluent	D.	„ 12	Inf.	4 faint	—	Severe delirium	180
265	1672 A. N. B.	M.	20	„ 5	„ 3	„ 5	„ 6	Mild	Rec.	—	Inf.	4 plain	—	——	94
266	1673 E. B.	M.	17	„ 5	„ 3	„ 5	„ 6	Mild	„	—	Inf.	3 plain	—	——	94
267	1674 C. L.	F.	32	„ 5	„ 2	„ 4	„ 7	Mild	„	—	Inf.	2 plain	—	Pregnant, 7 months	90
268	1675 A. B.	M.	49	„ 5	„ 3	„ 5	„ 6	Mild	„	—	Inf.	2 plain	—	——	94
269	1676 A. R.	M.	4	„ 6	Feb. 26	Feb 28	—	Confluent	„	—	Unvaccinated		—	——	181
270	1677 A. M.	M.	13	„ 6	Mar. 3	Mar. 5	Mar. 6	Mild	„	—	Inf.	4 plain	—	——	182
271	1678 J. P.	F.	18	„ 6	Feb. 29	„ 2	„ 7	Discrete	„	—	Inf.	4 plain	—	——	183
272	1679 E. D.	F.	40	„ 6	—	—	„ 7	Confluent	D.	Mar. 12	Inf.	2 plain	—	Delirium	184
273	1680 A. S.	M.	5	„ 6	Mar. 1	Mar. 3	„ 7	Confluent	D.	„ 14	Unvaccinated		—	——	122
274	1681 A. H.	F.	36	„ 6	„ 2	„ 4	„ 7	Confluent	Rec.	—	Inf.	2 plain	—	Delirium	106
275	1682 A. G.	F.	32	„ 6	„ 2	„ 4	„ 7	Confluent	D.	Mar. 13	Inf.	?	—	Delirium	185
276	1683 F. W.	M.	$\frac{9}{12}$	„ 6	„ 1	„ 3	„ 7	Confluent	D.	„ 12	Unvaccinated		—	——	186
277	1684 W. P.	M.	24	„ 6	Feb. 27	Feb. 29	—	Mild	Rec.	—	Inf.	3 plain	—	——	187
278	1685 E. A.	M.	32	„ 6	Mar. 3	Mar. 5	Mar. 7	Discrete	„	—	Inf.	1 large	—	——	120
279	1686 G. P.	M.	22	„ 6	„ 3	„ 5	—	Mild	„	—	Inf.	—	—	——	188
280	1688 A. L.	M.	$\frac{8}{12}$	„ 6	„ 3	„ 5	Mar. 7	Confluent	D.	Mar. 23	Unvaccinated		—	——	189
281	1689 H. K.	F.	39	„ 6	„ 1	„ 3	„ 7	Confluent	Rec.	—	Inf.	No marks	10 days before admission.	——	190
282	1690 A. W.	M.	17	„ 6	„ 2	„ 4	„ 7	Mild	„	—	Inf.	4 plain	—	——	191
283	1693 P. J.	F.	29	„ 7	„ 2	„ 5	—	Discrete	„	—	Inf.	—	—	——	108
284	1694 W. H.	M.	$\frac{5}{12}$	„ 7	„ 5	„ 7	Mar. 7	Confluent	D.	Mar. 21	Unvaccinated		—	——	106
285	1695 C. M.	F.	13	„ 7	„ 3	„ 5	„ 8	Mild	Rec.	—	Inf.	3 plain, 1 faint.	—	——	192
286	1696 N. W.	F.	13	„ 7	„ 1	„ 3	„ 8	Discrete	„	—	Inf.	4 plain	—	——	119
287	1697 S. A. L.	F.	26	„ 7	„ 5	„ 7	„ 9	Discrete	„	—	Inf.	4 plain	—	Pregnant, 7 months	193
288	1698 A. S.	M.	4	„ 7	„ 5	„ 7	—	Confluent	D.	Mar. 11	Unvaccinated		—	——	194
289	1699 F. M.	M.	12	„ 7	„ 1	„ 3	—	Discrete	Rec.	—	Unvaccinated		—	——	195
290	1700 G. S.	M.	38	„ 7	„ 1	„ 3	Mar. 8	Confluent	„	—	Inf.	2 faint	—	——	196
291	1701 E. T.	F.	31	„ 7	—	—	—	Confluent	D.	Mar. 22	Inf.	—	—	——	113
292	1702 R. C.	F.	27	„ 7	„ 4	Mar. 6	Mar. 9	Confluent	Rec.	—	Unvaccinated		—	——	197
293	1703 W. G.	M.	6	„ 7	„ 5	„ 7	„ 8	Confluent	„	—	Unvaccinated		—	——	198
294	1704 W. H.	M.	39	„ 7	„ 3	„ 5	„ 8	Confluent	„	—	Inf.	2 plain	—	——	199
295	1705 C. H.	F.	25	„ 7	„ 3	„ 5	„ 8	Discrete	„	—	Inf.	3 plain	—	——	200
296	1706 M. P.	F.	17	„ 7	„ 2	„ 3	—	Discrete	„	—	Inf.	—	—	——	201

297	1707	G. W.	M.	35	„	7	„	4	„	6	Mar.	8	Confluent	„	—	Inf.	3 plain	—	Delirium	202
298	1708	F. M.	F.	34	„	7	„	5	„	7	—		Confluent	„	—	Inf.	—	Mar. 3	———	203
299	1709	— H.	F.	43	„	7	—		—		—		Mild	„	—	Inf.	—	20 years ago	———	204
300	1710	M. A. G.	F.	38	„	7	Mar.	6	Mar.	8	Mar.	11	Mild	„	—	Inf.	2 plain	—	———	205
301	1711	M. B.	F.	28	„	8	„	5	„	7	„	8	Mild	„	—	Inf.	4 faint	—	Pregnant, 6 months	133
302	1712	T. M.	M.	30	„	8	„	4	„	6	„	9	Confluent	„	—	Inf.	4 faint	—	———	206
303	1713	O. C.	M.	13	„	8	„	2	„	4	„	8	Mild	„	—	Inf.	3 plain	—	———	110
304	1714	L. M.	F.	4	„	8	„	6	„	8	„	11	Confluent	„	—	Unvaccinated		—	Pneumonia	207
305	1716	E. J.	F.	3	„	8	„	2	„	4	„	11	Confluent	D.	Mar. 14	Unvaccinated		—	———	208
306	1717	N. C. H.	M.	6	„	8	„	3	„	7	—		Confluent	Rec.	—	Unvaccinated		—	———	209
307	—	E. H.	F.	9	—		„	17	„	19	—		Mild	„	—	Inf.	—	—	———	209
308	1718	T. B.	M.	13	„	8	„	7	„	9	Mar.	10	Malignant	D.	Mar. 12	Unvaccinated		—	———	210
309	1719	S. A. T.	F.	42	„	8	„	3	„	5	„	8	Mild	Rec.	—	Inf.	3 plain	—	———	211
310	1720	G. G.	M.	34	„	8	—		—		—		Confluent	D.	Mar. 20	Inf.	—	—	Information by neighbour who has charge of surviving children.	151
311	1721	J. P.	M.	50	„	8	—		—		—		Confluent	D.	„ 11	Inf.	—	—	———	212
312	1722	J. M.	M.	26	„	8	Mar.	2	Mar.	4	Mar.	8	Mild	Rec.	—	Inf.	3 faint	—	———	213
313	1723	C. P.	M.	30	„	8	„	4	„	6	—		Mild	„	—	Inf.	—	Twice, last occasion 7 years ago.	Very scanty rash.	214
314	1724	W. B.	F.	2/12	„	8	„	4	„	6	Mar.	11	Confluent	D.	Mar. 11	Unvaccinated		—	———	94
315	1725	T. D.	M.	26	„	8	„	5	„	7	—		Discrete	Rec.	—	Inf.	—	—	———	215
316	1726	W. H. P.	M.	8	„	9	„	3	„	8	—		Coherent	„	—	Unvaccinated		—	———	216
317	1727	G. G.	M.	34	„	9	„	4	„	7	—		Discrete	„	—	Inf.	—	—	———	104
318	1728	P. B.	M.	4	„	9	„	6	„	7	Mar.	8	Confluent	D.	Mar. 17	Unvaccinated		—	———	132
319	1729	M. E. C.	F.	10	„	9	„	8	„	10	„	13	Discrete	Rec.	—	Inf.	3 plain	—	———	146
320	1730	A. M.	F.	15	„	9	„	6	„	8	„	9	Mild	„	—	Inf.	4 plain	—	———	217
321	2427	A. S.	F.	3	Apr.	7	—		—		—		Confluent	„	—	Apr. 6	—	—	———	322
322	1731	H. B.	F.	30	Mar.	9	—		—		—		Mild	„	—	Inf.	—	—	———	58
323	1732	D. R.	F.	4/12	„	9	—		—		—		Confluent	D.	Mar. 14	Unvaccinated		—	} Twin sisters	136
324	1733	D. R.	F.	4/12	„	9	—		—		—		Confluent	D.	„ 15	Unvaccinated		—	}	136
325	1734	A. R.	F.	29	„	9	—		—		—		Mild	Rec.	—	Inf.	—	—	———	136
326	1735	H. M.	M.	14	„	9	Feb.	29	Mar.	2	—		Mild	„	—	Inf.	—	Recent 1	———	218
327	1736	L. R.	F.	4	„	9	—		—		—		Confluent	„	—	Unvaccinated		—	———	136
328	1737	C. M.	M.	1	„	9	Mar.	8	Mar.	10	Mar.	11	Mild	„	—	Unvaccinated		—	———	207
329	—	E. M.	F.	25	—		—		—		—		Mild	„	—	Inf.	—	—	———	207
330	1738	J. W.	M.	17	Mar.	9	Mar.	6	Mar.	8	—		Mild	„	—	Inf.	—	—	———	56
331	1739	T. W.	M.	21	„	9	„	1	„	3	Mar.	10	Discrete	„	—	Inf.	4 plain	—	———	219
332	1740	E. P.	M.	30	„	9	Feb.	22	Feb.	24	—		Discrete	„	—	Inf.	—	—	———	220
333	1741	M. M.	F.	29	„	9	Mar.	7	Mar.	9	—		Confluent	„	—	Inf.	—	—	———	221
334	1742	C. G. S.	M.	12	„	9	„	6	„	8	Mar.	13	Confluent	D.	Mar. 19	Unvaccinated		—	———	222
335	1743	E. G.	F.	1	„	9	„	3	„	5	„	11	Confluent	D.	„ 12	Unvaccinated		—	———	151
336	1744	A. R.	M.	25	„	9	„	2	„	4	—		Mild	Rec.	—	Inf.	—	—	———	223
337	1745	R. J.	M.	33	„	9	„	4	„	7	—		Mild	„	—	Inf.	—	—	———	224
338	1746	G. M.	M.	29	„	9	„	7	„	8	—		Coherent	„	—	Inf.	—	—	———	225
339	1747	P. G.	F.	32	„	9	—		—		—		Confluent	D.	Mar. 15	Inf.	—	—	Information by neighbour who has charge of surviving children.	151
340	1748	B. G.	F.	19	„	9	Mar.	7	Mar.	9	Mar.	12	Discrete	Rec.	—	Inf.	3 faint	—	———	142
341	1749	F. B.	F.	9	„	9	„	8	„	10	„	13	Discrete	„	—	Unvaccinated		—	———	97
342	1750	K. H.	M.	13	„	9	—		—		—		Confluent	„	—	Unvaccinated		—	———	226
343	1751	H. A. H.	M.	36	„	10	Mar.	6	Mar.	8	Mar.	10	Discrete	„	—	Inf.	4 faint	—	———	227
344	1753	M. B.	F.	26	„	10	„	8	„	10	„	12	Mild	„	—	Inf.	2 plain, 1 faint.	—	———	228

No.	Name and Notification Number.	Sex.	Age.	Date of Notification.	Date of Onset.	Date of Rash.	Date of Removal to Hospital.	Type of Attack.	Result.	Date of Death.	Vaccination. Date.	Vaccination. No. of Marks.	Re-vaccination Date.	Remarks.	No. in House Register.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
				1896.											
345	1754 E. N. I.	M.	40	Mar. 10	Mar. 5	Mar. 8	—	Confluent	D.	Mar. 12	Inf.	—	Twice (20 to 30), second time, nil.	Had been in prison service	229
346	1756 F. S.	F.	31	„ 10	„ 8	„ 10	Mar. 14	Mild	Rec.	—	Inf.	3 plain	—	——	129
347	1757 C. B.	F.	24	„ 10	„ 9	„ 11	„ 20	Discrete	„	—	Inf.	3 faint	—	——	230
348	1758 G. B.	M.	46	„ 10	„ 7	„ 9	„ 11	Discrete	„	—	Inf.	3 plain on each arm.	20 years ago	——	231
349	1759 E. S.	F.	26	„ 10	„ 8	„ 10	„ 12	Mild	„	—	Inf.	2 faint	—	——	232
350	1760 N. E.	M.	23	„ 10	„ 7	„ 9	—	Discrete	„	—	Inf.	—	—	——	233
351	1761 K. M.	F.	22	„ 10	„ 7	„ 9	Mar 12	Confluent	„	—	Inf.	3 faint	—	——	99
352	1762 A. T. B.	M.	8	„ 10	„ 5	„ 7	„ 14	Confluent	D.	Apr. 15	Unvaccinated		—	"Broncho-pneumonia"	67
353	1763 K. B.	F.	6	„ 10	„ 7	„ 9	„ 14	Confluent	D.	Mar. 28	Unvaccinated		—	——	67
354	1764 C. G.	F.	15	„ 10	„ 7	„ 9	„ 12	Mild	Rec.	—	Inf.	3 plain	—	——	142
355	1765 F. E. C.	F.	8	„ 10	„ 8	„ 10	„ 13	Confluent	„	—	Unvaccinated		—	——	146
356	1766 H. B.	M.	36	„ 10	„ 1	„ 2	—	Discrete	„	—	Inf.	—	—	A doubtful case	234
357	1767 L. D.	M.	1	„ 10	„ 4	„ 6	—	Confluent	D.	Mar. 17	Unvaccinated		—	——	235
358	1768 R. H.	M.	6	„ 11	„ 10	„ 12	Mar. 13	Confluent	Rec.	—	Unvaccinated		—	——	236
359	1769 H. H.	M.	6	„ 11	„ 8	„ 10	—	Confluent	„	—	Unvaccinated		—	——	237
360	1770 J. H. B.	M.	32	„ 11	„ 6	„ 9	—	Discrete	„	—	Inf.	—	—	——	238
361	1771 F. P.	M.	25	„ 11	„ 7	„ 9	—	Coherent	„	—	Inf.	—	—	——	239
362	1772 J. R.	M.	36	„ 11	„ 8	„ 10	Mar. 11	Mild	„	—	Inf.	5 plain	—	——	240
363	1773 E. J. J.	M.	29	„ 11	„ 7	„ 9	„ 12	Confluent	D.	Mar. 18	Inf.	3 faint	—	Alcoholism. Hæmorrhage into pustules.	241
364	1774 A. N.	M.	2/12	„ 11	„ 8	„ 10	„ 12	Mild	Rec.	—	Unvaccinated		—	——	140
365	1775 J. N.	F.	31	„ 11	„ 6	„ 8	„ 12	Discrete	„	—	Inf.	3 faint	—	——	140
366	1776 L. T.	F.	8	„ 11	„ 7	„ 9	—	Malignant	D.	Mar. 12	Unvaccinated		—	——	242
367	1777 H. F.	F.	49	„ 11	„ 6	„ 8	Mar. 11	Confluent	Rec.	—	Inf.	1 plain	—	——	243
368	1778 L. S.	F.	2/12	„ 11	„ 8	„ 10	—	Confluent	„	—	Unvaccinated		—	——	244
369	1779 E. P.	F.	17	„ 11	„ 1	„ 3	—	Discrete	„	—	Inf.	—	—	——	246
370	1780 E. W.	M.	23	„ 11	„ 7	„ 9	—	Mild	„	—	Inf.	—	—	——	245
371	1781 C. D.	M.	17	„ 11	„ 6	„ 8	—	Mild	„	—	Inf.	—	—	——	247
372	1782 E. B.	F.	41	„ 11	„ 7	„ 10	—	Discrete	„	—	Inf.	—	—	——	248
373	1783 J. B. S.	M.	17	„ 11	„ 3	„ 5	Mar. 11	Mild	„	—	Inf.	1 faint	—	——	249
374	1784 F. H.	F.	27	„ 11	„ 6	„ 8	—	Mild	„	—	Inf.	—	—	——	250
375	1785 W. V.	M.	39	„ 11	„ 8	„ 11	—	Confluent	„	—	Inf.	—	—	——	251
376	1786 V. P.	F.	5	„ 11	„ 4	„ 6	—	Confluent	D.	Mar. 20	Unvaccinated		—	——	252
377	1787 T. N.	M.	36	„ 12	„ 9	„ 13	—	Discrete	Rec.	—	Inf.	—	—	——	253
378	1788 G. S.	M.	37	„ 12	„ 8	„ 11	—	Discrete	„	—	Inf.	—	—	——	143
379	1789 J. T.	M.	38	„ 12	„ 9	„ 11	—	Discrete	„	—	Inf.	—	Since attack nil	Had "small-pox" 23 years ago	254
380	1790 L. S.	M.	8	„ 12	„ 8	„ 10	—	Confluent	„	—	Unvaccinated		—	——	143
381	1791 E. F.	F.	41	„ 12	„ 9	„ 10	—	Confluent	„	—	Inf.	—	Aged 15; no result.	——	255
382	1792 E. S.	F.	6	„ 12	„ 10	„ 12	—	Confluent	„	—	Unvaccinated		—	——	143
383	1793 R. J.	M.	3 wks.	„ 12	—	—	—	Confluent	D.	Apr. 3	Unvaccinated		—	Born March 12	256

384	1794	F. N.	- -	M.	12	„	12	Mar.	6	Mar.	8	Mar.	12	Discrete -	Rec.	—	Inf.	3 plain	—	—	150
385	1795	M. M.	- -	F.	35	„	12	„	9	„	11	„	17	Mild - -	„	—	Inf.	2 faint (2) 3 faint (1)	20 years ago	—	257
386	1796	A. S.	- -	M.	21	„	12	„	8	„	10	„	17	Discrete -	„	—	Inf.	4 plain	—	—	65
387	1797	A. J.	- -	M.	38	„	12	„	8	„	10	Apr.	13	Coherent -	„	—	Inf.	1 plain	—	—	258
388	—	H. G.	- -	M.	18	—		Apr.	25	Apr.	27	—		Mild - -	„	—	Inf.	2 scars	—	—	498
389	1799	C. C.	- -	M.	40	Mar.	12	Mar.	11	Mar.	13	Mar.	17	Confluent -	„	—	Inf.	?	—	—	260
390	1800	E. W.	- -	F.	41	„	13	„	10	„	12	—		Mild - -	„	—	Inf.	—	—	—	138
391	1801	A. P.	- -	M.	21	„	13	„	5	„	8	—		Mild - -	„	—	Inf.	—	—	—	261
392	1802	A. T.	- -	M.	25	„	13	„	9	„	11	—		Coherent -	„	—	Inf.	2 faint	—	—	262
393	1803	S. T.	- -	M.	22	„	13	„	10	„	12	—		Mild - -	„	—	Inf.	—	—	—	263
394	1805	F. C.	- -	M.	62	„	13	„	8	„	10	—		Discrete -	„	—	Inf.	—	—	—	264
395	1806	W. B.	- -	M.	17	„	13	Feb.	21	Feb.	23	—		Mild - -	„	—	Unvaccinated			—	265
396	1807	H. D.	- -	M.	8	„	13	Mar.	7	Mar.	12	—		Confluent -	„	—	Unvaccinated			—	266
397	1808	J. B.	- -	M.	77	„	13	„	7	„	9	—		Confluent -	D.	Mar. 17	Inf.	—		—	267
398	1809	F. J.	- -	F.	33	„	13	„	8	„	10	—		Confluent -	Rec.	—	Inf.	—		—	256
399	1810	H. R.	- -	M.	17	„	13	—		—		—		Mild - -	„	—	Inf.	—		—	268
400	1811	T. R.	- -	M.	35	„	13	—		—		—		Coherent -	„	—	Inf.	—		—	136
401	—	D. R.	- -	M.	1	—		—		—		—		Discrete -	„	—	Unvaccinated			—	136
402	1812	D. R.	- -	M.	28	Mar.	13	—		—		—		Discrete -	„	—	Inf.	—		—	268
403	1813	W. E.	- -	M.	42	„	13	—		—		—		Confluent -	D.	Mar. 21	Inf.	—		—	156
404	1814	W. W.	- -	M.	30	„	13	Mar.	5	Ma .	7	—		Confluent -	Rec.	—	Inf.	—		—	269
405	1815	W. B.	- -	M.	3	„	13	„	9	„	11	Mar.	14	Confluent -	D.	Mar. 28	Unvaccinated			—	67
406	1816	A. J.	- -	F.	25	„	13	„	9	„	11	—		Confluent	Rec.	—	Inf.	—		—	270
407	1817	F. B.	- -	F.	5	„	13	„	9	„	11	Mar.	14	Confluent -	„	—	Unvaccinated			—	271
408	1818	G. M.	- -	M.	53	„	13	„	7	„	9	—		Confluent -	D.	Mar. 16	Inf.	—		—	272
409	1819	J. E. P.	- -	M.	45	„	13	„	11	„	12	—		Discrete -	Rec.	—	Inf.	—		—	273
410	1820	E. L.	- -	M.	23	„	13	„	10	„	12	—		Discrete -	„	—	Inf.	—		—	274
411	1821	T. E.	- -	M.	7	„	13	„	11	„	13	—		Confluent -	„	—	Unvaccinated			—	275
412	1822	J. W.	- -	M.	16	„	13	„	9	„	13	Mar.	12	Confluent -	„	—	Inf.	—		—	276
413	1823	F. N.	- -	F.	2	„	13	„	9	„	11	„	12	Confluent -	„	—	Unvaccinated			—	140
414	1824	S. P.	- -	M.	12	„	13	„	8	„	10	„	14	Confluent -	„	—	Inf.	No marks		—	118
415	1825	R. P.	- -	M.	14	„	13	„	8	„	10	„	14	Confluent -	D.	Mar. 21	Unvaccinated			—	118
416	1826	E. K.	- -	M.	26	„	14	—		—		—		Discrete -	Rec.	—	Inf.	—		—	277
417	1827	T. M.	- -	M.	17	„	14	Mar.	12	Mar.	14	Mar.	17	Confluent -	D.	Mar. 24	Unvaccinated			—	278
418	1828	A. L.	- -	F.	67	„	14	„	7	„	10	—		Confluent -	Rec.	—	Inf.	—	10 years ago	-	279
419	1829	E. A.	- -	M.	19	„	14	Feb.	21	Feb.	23	—		Discrete -	„	—	Inf.	—		—	280
420	1830	R. S.	- -	F.	27	„	14	Mar.	9	Mar.	11	—		Discrete -	„	—	Inf.	—		—	281
421	1831	E. A.	- -	F.	42	„	14	„	10	„	12	Mar.	14	Confluent -	„	—	Inf.	3 faint		—	152
422	1832	A. C.	- -	M.	30	„	14	„	8	„	10	—		Discrete -	„	—	Inf.	—		—	149
423	—	M. C.	- -	F.	39	—		„	22	„	24	—		Mild - -	„	—	Inf.	—		—	149
424	1833	E. G.	- -	F.	8	Mar.	14	„	9	„	11	Mar.	12	Discrete -	„	—	Unvaccinated			—	151
425	1834	F. G.	- -	F.	6	„	14	„	9	„	11	„	12	Confluent -	D.	Mar. 14	Unvaccinated			—	151
426	1835	E. G.	- -	M.	2	„	14	„	9	„	11	„	12	Confluent -	D.	„ 19	Unvaccinated			—	151
427	1836	P. L.	- -	M.	17	„	14	„	7	„	11	—		Mild - -	Rec.	—	Inf.	—		—	282
428	1837	N. M.	- -	F.	5	„	14	„	13	„	15	Mar.	17	Confluent -	D.	Mar. 20	Unvaccinated			—	213
429	1838	O. B.	- -	M.	8	„	14	„	11	„	13	„	16	Confluent -	D.	„ 24	Unvaccinated			—	94
430	1839	A. B.	- -	M.	9	„	14	„	8	„	10	—		Confluent -	D.	„ 17	Unvaccinated			—	147
431	1840	A. H.	- -	F.	45	„	14	„	11	„	13	Mar.	14	Mild - -	Rec.	—	Inf.	2 faint		—	283
432	1841	A. B.	- -	M.	36	„	15	„	12	„	14	„	18	Mild - -	„	—	Inf.	4 faint	23 years ago	-	284

Removed from home on illness of others to House 96, on March 9. Slept two nights with E. A. (No. 567).

Said to have contracted "cow-pox" in 1882 when milking.

No.	Name and Notification Number.	Sex.	Age.	Date of				Type of Attack.	Result.	Date of Death.	Vaccination.		Re-vaccination Date.	Remarks.	No. in House Re-gister.
				Notification.	Onset.	Rash.	Removal to Hospital.				Date.	No. of Marks.			
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
				1896.											
433	1842 A. W.	F.	48	Mar. 15	Mar. 11	Mar. 14	—	Confluent	Rec.	—	Inf.	—	—	——	285
434	1843 A. W.	M.	20	„ 15	—	—	—	Mild	„	—	Inf.	—	—	——	286
435	1844 E. T.	F.	7	„ 15	Mar. 12	Mar. 14	—	Malignant	D.	Mar. 15	Unvaccinated		—	——	287
436	1845 A. G.	F.	23	„ 15	„ 12	„ 15	—	Confluent	Rec.	—	Inf.	—	—	——	288
437	1846 F. C.	F.	29	„ 15	„ 11	„ 13	—	Confluent	„	—	Inf.	—	—	——	146
438	1847 M. A. M.	F.	12	„ 15	„ 12	„ 14	Mar. 18	Confluent	„	—	Unvaccinated		—	——	289
439	1848 G. A.	M.	21	„ 15	„ 10	„ 12	„ 17	Discrete	„	—	Inf.	4 plain	—	——	152
440	1849 T. S.	M.	7	„ 15	„ 12	„ 14	„ 17	Discrete	„	—	Unvaccinated		—	——	123
441	1850 T. S.	F.	28	„ 15	„ 9	„ 11	—	Coherent	„	—	Inf.	—	—	——	290
442	1851 A. T.	F.	32	„ 15	„ 10	„ 12	—	Discrete	„	—	Inf.	—	—	——	292
443	1852 E. B.	F.	25	„ 15	„ 12	„ 14	—	Coherent	„	—	Inf.	—	—	——	291
444	1853 T. B.	M.	11	„ 15	„ 11	„ 13	—	Mild	„	—	Inf.	—	—	——	293
445	1854 E. A.	M.	6	„ 15	„ 12	„ 14	Mar. 16	Confluent	„	—	Unvaccinated		—	——	294
446	1855 E. S.	F.	14	„ 15	„ 13	„ 15	„ 16	Confluent	D.	Mar. 23	Inf.	4 plain	—	"Chorea"	168
447	1856 S. S.	M.	14	„ 15	„ 11	„ 13	—	Discrete	Rec.	—	Inf.	—	—	——	295
448	1857 S. D.	M.	6	„ 15	„ 13	„ 15	Mar. 18	Discrete	„	—	Unvaccinated		—	Attempt at vaccination, March 7	184
449	1858 W. G.	M.	42	„ 16	„ 11	„ 15	—	Discrete	„	—	Inf.	—	—	——	296
450	1859 P. H.	M.	7	„ 16	„ 13	„ 15	Mar. 17	Confluent	„	—	Unvaccinated		—	——	297
451	1860 E. S.	M.	3	„ 16	„ 10	„ 12	„ 14	Confluent	„	—	Unvaccinated		—	——	129
452	1861 O. S.	F.	1	„ 16	„ 10	„ 12	„ 14	Confluent	D.	Mar. 31	Unvaccinated		—	——	129
453	1862 C. F.	F.	26	„ 16	„ 13	„ 15	„ 18	Confluent	Rec.	—	Inf.	?	—	Marks obscured by rash	298
454	1863 E. G.	F.	34	„ 16	Feb. 29	„ 2	—	Mild	„	—	Inf.	—	Aged 16, 3 places	——	299
455	1864 M. G.	F.	6	„ 16	Mar. 14	„ 16	Mar. 18	Coherent	„	—	Unvaccinated		—	——	299
456	1865 F. G.	F.	4	„ 16	Feb. 22	Feb. 25	—	Coherent	„	—	Unvaccinated		—	——	299
457	— F. L. G.	M.	8	—	Mar. 12	Mar. 14	Mar. 18	Discrete	„	—	Unvaccinated		—	——	299
458	1866 R. B.	M.	36	Mar. 16	„ 13	„ 15	„ 18	Confluent	„	—	Inf.	2 faint, 2 plain.	—	——	300
459	1867 D. C.	M.	6	„ 16	„ 12	„ 14	—	Confluent	D.	Mar. 22	Unvaccinated		—	——	301
460	1868 N. S.	F.	40	„ 16	„ 13	„ 15	—	Coherent	Rec.	—	Inf.	4 good	—	——	302
461	1869 T. N.	M.	8	„ 16	„ 12	„ 14	—	Confluent	„	—	Unvaccinated		—	——	303
462	1870 W. N.	M.	36	„ 16	„ 13	„ 15	Mar. 17	Confluent	D.	Mar. 20	Unvaccinated		—	——	170
463	— G. N.	F.	$\frac{1}{12}$	—	„ 13	„ 15	„ 18	Confluent	D.	„ 25	Unvaccinated		—	——	170
464	1871 C. N.	F.	39	Mar. 16	„ 13	„ 15	„ 18	Coherent	Rec.	—	Inf.	3 faint	—	——	170
465	1872 J. E.	M.	30	„ 16	„ 14	„ 16	—	Coherent	„	—	Inf.	—	—	——	304
466	1873 H. E. T.	M.	2	„ 16	—	—	—	Confluent	„	—	Unvaccinated		—	——	113
467	1874 E. M.	F.	1	„ 16	Mar. 14	Mar. 16	—	Confluent	„	—	Unvaccinated		—	——	305
468	1875 M. D.	F.	55	„ 17	„ 11	„ 13	Mar. 17	Confluent	D.	Mar. 21	Inf.	No marks	—	Dementia, past 3 years	306
469	1876 T. H.	M.	26	„ 17	„ 11	„ 13	„ 21	Mild	Rec.	—	Inf.	3 plain	—	——	307
470	1877 L. L.	M.	2	„ 17	—	—	—	Confluent	D.	Mar. 21	Unvaccinated		—	——	308
471	1878 G. J. J.	M.	51	„ 17	Mar. 11	Mar. 13	Mar. 18	Discrete	Rec.	—	Inf.	No marks	—	Carcinoma Recti	309
472	1879 F. C.	M.	23	„ 17	„ 8	„ 12	—	Discrete	„	—	Inf.	—	Mar. 3; 3 places	——	172
473	1880 L. C.	F.	14	„ 17	„ 15	„ 17	Mar. 19	Discrete	„	—	Inf.	4 plain	Attempted on March 11.	——	310
474	1881 G. B.	M.	16	„ 17	„ 11	„ 13	—	Discrete	„	—	Inf.	1 faint	—	——	311

475	1882	E. H.	F.	54	„ 17	„ 10	„ 11	—	Discrete	„	—	Inf. —	—			312
476	1883	W. H.	M.	6	„ 17	„ 13	„ 15	Mar. 18	Coherent	„	—	Unvaccinated	—			283
477	1884	E. G. B.	M.	5	„ 17	„ 8	„ 10	—	Confluent	D.	Mar. 15	Unvaccinated	—			313
478	1885	I. M. C.	F.	2	„ 17	„ 6	„ 8	—	Confluent	D.	„ 15	Unvaccinated	—			150
479	1886	P. G. T.	M.	7	„ 17	„ 4	„ 6	—	Confluent	Rec.	—	Unvaccinated	—			113
480	1887	T. H.	M.	41	„ 17	—	—	—	Mild	„	—	Inf. —	—			171
481	1888	E. P.	F.	33	„ 17	Mar. 10	Mar. 16	—	Discrete	„	—	Inf. —	—			148
482	1889	A. M.	M.	4	„ 17	„ 12	„ 14	—	Discrete	„	—	Unvaccinated	—			314
483	1890	M. P.	F.	40	„ 17	—	—	—	Mild	„	—	Inf. —	12 years ago			315
484	1891	A. P.	M.	4	„ 17	Mar. 4	Mar. 6	—	Confluent	D.	Mar. 25	Unvaccinated	—			316
485	1892	E. D.	F.	28	„ 17	„ 12	„ 15	—	Discrete	Rec.	—	Inf. —	—			317
486	1893	E. G.	F.	5	„ 17	„ 14	„ 16	Mar. 19	Confluent	„	—	Unvaccinated	—			318
487	1894	G. C.	F.	9	„ 17	„ 12	„ 14	—	Confluent	„	—	Unvaccinated	—			319
488	1895	G. F. L.	M.	25	„ 17	„ 15	„ 17	—	Mild	„	—	Inf. —	—			320
489	1896	A. J.	F.	6	„ 17	„ 13	„ 15	Mar. 19	Confluent	„	—	Unvaccinated	—			321
490	1897	W. S.	M.	41	„ 17	„ 14	„ 16	„ 19	Mild	„	—	Inf. 2 plain, 1 faint	—			322
491	1898	M. R.	F.	2	„ 17	—	—	—	Confluent	D.	Mar. 23	Unvaccinated	—			323
492	1899	A. M.	M.	6	„ 17	Mar. 12	Mar. 16	—	Confluent	Rec.	—	Unvaccinated	—			64
493	—	T. M.	M.	4	—	„ 29	April 2	—	Confluent	„	—	Unvaccinated	—			64
494	—	A. M.	F.	33	—	„ 8	Mar. 10	—	Mild	„	—	Inf. —	—			64
495	1900	L. B.	M.	7	Mar. 17	„ 12	„ 14	—	Confluent	„	—	Unvaccinated	—			324
496	1901	C. B.	F.	25	„ 17	„ 14	„ 16	—	Mild	„	—	Inf. —	—			325
497	—	A. B.	M.	26	—	Apr. 2	April 6	—	Confluent	„	—	Inf. —	—			325
498	1902	V. C.	F.	8	Mar. 17	Mar. 12	Mar. 15	—	Confluent	„	—	Unvaccinated	—			159
499	—	A. C.	F.	29	—	„ 14	„ 15	—	Mild	„	—	Inf. —	—	Very mild; thought to be "German measles."		159
500	1903	I. H.	F.	28	Mar. 18	„ 14	„ 16	Mar. 18	Discrete	„	—	Inf. 4 plain	—			326
501	—	E. M.	F.	9	—	April 2	April 3	—	Mild	„	—	Inf. —	—			64
502	1904	E. C.	F.	3	Mar. 18	Mar. 14	Mar. 16	—	Malignant	D.	Mar. 18	Unvaccinated	—			327
503	1905	J. S.	M.	25	„ 18	—	—	—	Discrete	Rec.	—	Inf. —	—			328
504	1906	C. S.	M.	22	„ 18	Mar. 16	Mar. 17	—	Mild	„	—	Inf. —	—			329
505	1907	R. D.	M.	18	„ 18	„ 14	„ 16	—	Confluent	D.	Mar. 26	Unvaccinated	—			330
506	1908	W. T.	M.	4	„ 18	„ 13	„ 15	Mar. 19	Confluent	D.	„ 26	Unvaccinated	—	Unsuccessful attempt at vaccination on March 10.		331
507	1909	A. P.	M.	12	„ 18	„ 15	„ 17	—	Confluent	Rec.	—	Unvaccinated	—			332
508	1910	W. H. A.	M.	7	„ 18	„ 14	„ 17	—	Coherent	„	—	Mar. 14 —	—			333
509	3312	H. H.	M.	28	May 28	May 26	May 28	May 29	Malignant	D.	June 1	Unvaccinated	—	Infantile vaccination said to have been unsuccessful.		633
510	3292	J. M.	M.	25	„ 24	„ 21	„ 23	„ 24	Mild	Rec.	—	Inf. 4 scars, plain.	—			958
511	1913	L. L.	F.	6	Mar. 19	Mar. 16	Mar. 18	Mar. 20	Confluent	D.	Mar. 29	Unvaccinated	—			189
512	1914	C. L.	F.	28	„ 19	„ 16	„ 18	„ 20	Confluent	D.	May 2	Inf. No marks	—	Died of syncope, when convalescent.		189
513	1915	A. L.	F.	9	„ 19	„ 16	„ 18	„ 20	Mild	Rec.	—	Inf. —	—			189
514	1916	L. C.	F.	3	„ 19	„ 15	„ 17	—	Confluent	„	—	Unvaccinated	—			150
515	1917	A. L.	M.	8	„ 19	„ 16	„ 18	Mar. 20	Confluent	D.	Mar. 20	Unvaccinated	—			189
516	1918	M. E. B.	F.	9	„ 19	„ 13	„ 15	—	Confluent	D.	„ 27	Unvaccinated	—			335
517	1919	E. D.	M.	24	„ 19	„ 13	„ 15	Mar. 18	Confluent	Rec.	—	Inf. 3 faint	—			336
518	1920	K. K.	F.	6	„ 19	„ 12	„ 14	—	Confluent	D.	Mar. 26	Unvaccinated	—			337
519	2619	G. W.	M.	25	April 13	April 7	April 9	April 12	Confluent	Rec.	—	Inf. 4 good	—			669
520	1922	W. A. T.	M.	26	Mar. 19	Mar. 15	Mar. 17	—	Discrete	„	—	Inf. 4 plain	—			338
521	1923	E. S.	F.	31	„ 19	„ 16	„ 18	—	Coherent	„	—	Inf. —	—			339
522	1924	J. Q.	F.	19	„ 19	„ 15	„ 17	Mar. 24	Mild	„	—	Inf. —	—	? Small-pox in 1887		340
523	1925	J. C.	M.	22	„ 19	„ 13	„ 14	—	Discrete	„	—	Inf. —	—			341

No.	Name and Notification Number.	Sex.	Age.	Date of Notification.	Date of Onset.	Date of Rash.	Date of Removal to Hospital.	Type of Attack.	Result.	Date of Death.	Vaccination. Date.	Vaccination. No.[1] of Marks.	Re-vaccination Date.	Remarks.	No. in House Register.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
				1896.											
524	1926 C. S.	M.	5	Mar. 19	—	—	—	Confluent	D.	April 14	Unvaccinated		—	——	244
525	1927 W. S.	M.	4	„ 19	—	—	—	Confluent	D.	May 9	Unvaccinated		—	——	244
526	1928 J. S.	M.	1	„ 19	Mar. 16	Mar. 18	—	Confluent	D.	April 2	Unvaccinated		—	——	244
527	1929 E. S.	F.	3	„ 19	„ 16	„ 18	—	Confluent	D.	„ 4	Unvaccinated		—	——	244
528	1930 H. H.	M.	1	„ 19	„ 13	„ 15	Mar. 22	Confluent	D.	Mar. 24	Unvaccinated		—	——	165
529	1931 E. P.	F.	8	„ 19	„ 13	„ 16	—	Confluent	Rec.	—	Unvaccinated		—	——	342
530	1932 C. S.	F.	33	„ 19	—	—	—	Mild	„	—	Inf.	—	—	——	244
531	1933 H. A. P.	M.	30	„ 19	Mar. 16	Mar. 19	—	Discrete	„	—	Inf.	—	Attempted during attack.	——	343
532	1934 J. S.	M.	32	„ 20	„ 14	„ 17	—	Mild	„	—	Inf.	—	—	——	344
533	1935 G. M.	M.	4	„ 20	„ 15	„ 17	Mar. 20	Confluent	D.	Mar. 27	Unvaccinated		—	——	345
534	1936 E. A. M.	F.	11	„ 20	„ 16	„ 18	„ 19	Confluent	Rec.	—	Unvaccinated		—	——	195
535	— G. H. T.	M.	24	—	„ 10	„ 12	—	Mild	„	—	Inf.	—	Mareh 10. Nil.	——	263
536	— C. M.	M.	44	—	—	—	—	Discrete	„	—	Inf.	—	—	——	444
537	1939 A. S.	M.	5	Mar. 20	Mar. 17	Mar. 19	Mar. 20	Confluent	D.	Mar. 26	Unvaccinated		—	——	194
538	1940 B. R. S.	F.	7	„ 20	„ 17	„ 19	„ 20	Confluent	D.	„ 29	Unvaccinated		—	——	194
539	1941 P. S.	F.	9	„ 20	„ 17	„ 19	„ 20	Confluent	D.	„ 28	Unvaccinated		—	——	194
540	1942 A. S.	F.	14	„ 20	„ 15	„ 17	„ 20	Mild	Rec.	—	Inf.	4 plain	—	——	194
541	1943 C. S.	M.	10	„ 20	„ 16	„ 18	„ 20	Discrete	„	—	Inf.	3 plain	—	——	194
542	1944 A. S.	F.	34	„ 20	„ 15	„ 17	„ 20	Mild	„	—	Inf.	3 faint	—	Pregnant; syphilitic	194
543	1946 K. E.	F.	5	„ 20	„ 15	„ 17	—	Confluent	„	—	Unvaccinated		—	——	275
544	1947 A. S.	F.	16	„ 20	„ 17	„ 19	Mar. 19	Malignant	D.	Mar. 24	Inf.?	No marks	—	Congenital syphilis; scar in liver	347
545	1948 W. R.	M.	53	„ 20	„ 19	„ 20	—	Discrete	Rec.	—	Inf.	—	—	——	349
546	1949 A. K.	M.	24	„ 20	„ 18	„ 20	—	Mild	„	—	Inf.	—	—	——	348
547	1950 J. H.	M.	29	„ 20	„ 18	„ 20	—	Confluent	„	—	Inf.	—	—	——	177
548	1951 E. F.	M.	24	„ 20	„ 18	„ 19	—	Mild	„	—	Inf.	—	—	Doubtful case	350
549	1952 E. M'M.	F.	26	„ 20	„ 20	„ 22	Mar. 24	Mild	„	—	Inf.	1 plain, 1 faint.	—	Pregnant, 7½ months	351
550	— E. M'M.	F.	38 hrs.	—	—	—	Apr. 7	Indeterminate	D.	Apr. 7	Unvaccinated		—	Born in hospital 7th April, premature (8 months).	351
551	1953 E. J.	F.	46	Mar. 20	Mar. 17	Mar. 19	—	Mild	Rec.	—	Inf.	—	—	——	352
552	1954 W. G. L.	M.	20	„ 20	„ 18	„ 20	Mar. 22	Coherent	„	—	Inf.	4 plain	—	——	353
553	1955 W. R.	M.	8	„ 20	„ 13	„ 15	—	Confluent	„	—	Mar. 12	—	—	——	181
554	1956 A. K.	F.	30	„ 20	„ 19	„ 21	Mar. 24	Discrete	„	—	Inf.	3 plain	—	——	354
555	1957 E. S.	M.	8	„ 20	„ 18	„ 20	—	Confluent	D.	Mar. 23	Unvaccinated		—	No. 946 (fatal), stepbrother	122
556	— S. S.	M.	10	—	„ 1	„ 3	—	Mild	Rec.	—	Inf.	—	—	——	122
557	— T. S.	M.	14	—	„ 8	„ 10	—	Mild	„	—	Inf.	—	—	——	122
558	1958 F. G.	M	34	Mar. 20	„ 15	„ 17	—	Mild	„	—	Inf.	—	—	——	355
559	1959 N. P.	F.	3	„ 20	„ 18	„ 20	—	Confluent	D.	Mar. 27	Unvaccinated		—	——	356
560	1960 E. T.	F.	32	„ 20	„ 18	„ 19	—	Discrete	Rec.	—	Inf.	—	11 or 12 years ago.	——	357
561	1961 G. P.	M.	5	„ 20	„ 11	„ 13	—	Confluent	„	—	Unvaccinated		—	——	356
562	1962 W. C.	M.	8	„ 20	„ 14	„ 16	Mar. 23	Confluent	„	—	Unvaccinated		—	——	358
563	1963 A. P.	M.	8	„ 20	„ 11	„ 13	—	Confluent	„	—	Unvaccinated		—	——	356

564	1964	L. H.	F.	5	„	20	„	17	„	19	—	Confluent	„	—	Unvaccinated	—	—	359
565	1965	E. L.	M.	15	„	20	„	13	„	15	Mar. 22	Mild	„	—	Inf.	3 plain	—	—	360
566	1966	E. H.	F.	23	„	21	„	16	„	19	—	Discrete	„	—	Inf.	—	—	—	361
567	1967	E. A.	M.	14	„	21	„	16	„	18	—	Discrete	„	—	Inf.	—	—	—	96
568	1968	L. M.	F.	18	„	21	—		—		—	Confluent	D.	Mar. 26	Unvaccinated		—	—	362
569	1969	E. F.	F.	20	„	21	Mar.	17	Mar.	19	—	Discrete	Rec.	—	Inf.	—	—	—	363
570	1970	D. M.	M.	9	„	19	„	14	„	16	Mar. 18	Discrete	„	—	Unvaccinated		—	—	182
571	1971	C. M.	F.	15	„	19	„	15	„	17	„ 18	Confluent	„	—	Inf.	4 plain	—	—	182
572	1972	E. D.	F.	38	„	21	„	19	„	21	—	Confluent	„	—	Inf.	—	—	—	364
573	1974	A. S.	M.	55	„	21	„	19	„	21	—	Discrete	„	—	Inf.	—	—	—	365
574	1976	H. M.	M.	5	„	21	„	19	„	21	Mar. 22	Malignant	D.	Mar. 23	Unvaccinated		—	—	366
575	1977	F. M.	F.	8	„	21	„	17	„	19	—	Coherent	Rec.	—	Unvaccinated		—	—	116
576	1978	L. M.	M.	14	„	21	—		—		—	Mild	„	—	Inf.	—	—	—	116
577	1979	Mrs. G.	F.	34	„	21	—		—		—	Mild	„	—	Inf.	—	—	—	368
578	1980	B. J.	F.	9	„	21	Mar.	14	Mar.	16	—	Mild	„	—	Inf.	—	—	—	369
579	1981	A. M.	M.	11	„	21	„	19	„	21	—	Mild	„	—	Inf.	—	1 recent	—	218
580	—	J. M.	F.	10	—		—		Feb.	22	—	Mild	„	—	Inf.	—	—	—	218
581	1982	M. L.	F.	24	Mar.	21	Mar.	18	Mar.	20	—	Mild	„	—	Inf.	—	—	—	370
582	1983	M. S.	F.	27	„	21	„	19	„	21	Mar. 24	Confluent	„	—	Inf.	4 plain, 1 faint.	14 years ago	—	117
583	—	L. P.	F.	7	—		„	4	„	6	—	Confluent	„	—	Unvaccinated		—	—	117
584	1984	W. R.	M.	27	Mar.	21	„	19	„	21	—	Discrete	„	—	Inf.	—	—	—	119
585	1985	G. S.	M.	12	„	21	—		—		—	Mild	„	—	Inf.	—	Yes	—	194
586	1986	— M.	F.	42	„	21	Mar.	17	Mar.	19	—	Discrete	„	—	Inf.	—	—	—	272
587	1987	E. M.	F.	15	„	21	—		—		—	Confluent	„	—	Inf.	No marks	—	—	272
588	1990	T. H. P.	M.	14	„	21	Mar.	20	Mar.	22	—	Mild	„	—	Inf.	—	—	—	356
589	1992	C. D.	F.	10	„	21	„	18	„	20	—	Coherent	„	—	Mar. 9	—	—	—	372
590	1993	E. M.	F.	17	„	21	„	17	„	19	—	Confluent	D.	Apr. 2	Unvaccinated		—	Three attempts at vaccination in infancy, all failed.	272
591	1994	M. H.	F.	38	„	21	—		—		—	Confluent	D.	Mar. 20	Inf.	—	—	Information from neighbours	131
592	1996	E. D.	F.	2	„	22	—		—		—	Confluent	D.	„ 26	Unvaccinated		—	—	374
593	1995	M. C.	F.	23	„	22	Mar.	15	Mar.	17	—	Confluent	Rec.	—	Inf.	3 good	—	—	373
594	1997	A. F.	M.	40	„	22	„	18	„	20	Mar. 23	Confluent	„	—	Inf.	3 faint	—	—	375
595	1998	F. A.	F.	16	„	22	„	19	„	21	—	Mild	„	—	Inf.	—	—	—	376
596	1999	C. A.	M.	7	„	22	„	19	„	21	—	Confluent	„	—	Unvaccinated		—	—	376
597	2000	M. L.	F.	23	„	22	—		—		—	Mild	„	—	Inf.	—	—	—	377
598	2001	C. S.	F.	29	„	22	Mar.	17	Mar.	20	—	Coherent	„	—	Inf.	No marks	—	—	378
599	2002	H. W.	F.	42	„	22	—		—		—	Malignant	D.	Mar. 22	Inf.	—	—	Information by neighbours	379
600	2003	A. P.	M.	21	„	22	—		—		—	Discrete	Rec.	—	Inf.	—	—	—	246
601	2004	M. T.	F.	8	„	22	—		Mar.	20	—	Confluent	„	—	Unvaccinated		—	Attempted vaccination, March 18, not successful.	380
602	2005	C. B.	M.	49	„	23	Mar.	19	„	22	—	Mild	„	—	Inf.	4 plain	—	—	381
603	2006	S. A.	M.	9	„	23	„	18	„	20	Mar. 23	Mild	„	—	Inf.	—	—	—	240
604	2007	F. M. S.	F.	2	„	23	„	20	„	21	—	Confluent	D.	Mar. 31	Unvaccinated		—	—	382
605	2008	M. P.	F.	30	„	23	„	21	„	23	—	Mild	Rec.	—	Inf.	—	—	—	252
606	2009	M. B.	F.	4	„	23	„	20	„	22	Mar. 24	Confluent	D.	Apr. 12	Vaccinated 2 days before admission.		—	Meningitis?	383
607	2010	H. S.	M.	11/12	„	23	„	21	„	23	„ 24	Coherent	D.	„ 13	Unvaccinated		—	Rash some days before full development. Died from broncho-pneumonia, April 13.	232
608	2011	A. P.	M.	37	„	23	„	20	„	22	„ 24	Discrete (severe).	Rec.	—	Inf.	1 plain, 1 faint.	—	—	384
609	2012	T. M.	M.	14	„	23	„	19	„	21	—	Discrete	„	—	Inf.	—	March 19	—	272
610	2913	A. M.	M.	6 wks.	„	23	—		—		—	Confluent	D.	Mar. 27	Unvaccinated		—	—	272
611	2014	H. L.	M.	17	„	23	Mar.	19	Mar.	21	—	Discrete	Rec.	—	Inf.	—	—	—	385

No.	Name and Notification Number.	Sex.	Age.	Date of				Type of Attack.	Result.	Date of Death.	Vaccination.		Re-vaccination Date.	Remarks.	No. in House Register.
				Notification.	Onset.	Rash.	Removal to Hospital.				Date.	No. of Marks.			
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
				1896.											
612	2015 W. H.	M.	70	Mar. 23	Mar. 20	Mar. 22	—	Confluent	Rec.	—	Inf.	—	—	——	386
613	— Mrs. H.	F.	69	—	—	—	—	Discrete	„	—	Childhood	—	—	——	386
614	2016 E. W.	F.	41	Mar. 23	Mar. 16	Mar. 18	—	Discrete	„	—	Inf.	—	—	——	387
615	2017 A. S.	M.	20	„ 23	„ 19	„ 23	—	Mild	„	—	Inf.	—	—	——	388
616	2018 G. W.	F.	12	„ 23	„ 22	„ 23	—	Mild	„	—	Inf.	1 large	—	——	389
617	2019 — S.	F.	24	„ 23	„ 16	„ 18	—	Mild	„	—	Inf.	—	—	——	390
618	2020 E. W.	F.	2	„ 23	„ 21	„ 23	—	Mild	„	—	Unvaccinated		—	——	389
619	2021 J. D.	F.	24	„ 23	„ 20	„ 23	—	Discrete	„	—	Inf.	—	—	——	215
620	2022 F. M.	M.	30	„ 23	„ 17	„ 19	Mar. 24	Confluent	„	—	Inf.	3 faint	—	——	208
621	2023 C. P.	F.	35	„ 23	„ 14	„ 15	—	Malignant	D.	Mar. 21	Inf.	—	—	——	356
622	2024 E. C.	F.	26	„ 24	„ 15	„ 17	—	Confluent	D.	„ 30	Inf.	—	—	Confined March 11	391
623	— C. (Infant)	M.	12 hrs.	—	—	—	—	Indeterminate	D.	„ 12	Unvaccinated		—	Covered with eruptions	391
624	2025 A. M.	F.	5	Mar. 24	Mar. 23	Mar. 24	—	Coherent	Rec.	—	Mar. 19	—	—	——	195
625	2026 E. H.	F.	4	„ 24	„ 18	„ 20	—	Confluent	„	—	Unvaccinated		—	——	392
626	2027 J. M.	M.	38	„ 24	„ 18	„ 20	—	Confluent	„	—	Inf.	—	Attempt 7 years ago. No result.	——	393
627	2028 C. T.	M.	38	„ 24	„ 17	„ 19	—	Discrete	„	—	Inf.	—	—	——	394
628	2029 G. P.	M.	18	„ 24	„ 18	„ 20	Mar. 24	Confluent	„	—	Inf.	4 plain	—	——	246
629	2030 W. G.	M.	66	„ 24	„ 17	„ 19	—	Mild	„	—	Inf.	—	2 years ago. No result.	——	246
630	2031 W. M.	F.	2	„ 24	„ 19	„ 21	—	Confluent	D.	Mar. 30	Unvaccinated		—	——	395
631	2032 N. P.	F.	24	„ 24	„ 17	„ 19	—	Discrete	Rec.	—	Inf.	—	—	——	246
632	2033 W. M.	M.	12	„ 24	„ 19	„ 21	—	Mild	„	—	Inf.	—	Mar. 19	——	272
633	2034 G. W.	M.	28	„ 24	„ 16	„ 21	—	Discrete	„	—	Inf.	—	—	——	186
634	2035 M. P.	F.	30	„ 24	„ 22	„ 24	—	Mild	„	—	Inf.	—	—	A doubtful case	187
635	2036 A. M.	F.	2	„ 24	„ 21	„ 23	—	Mild	„	—	Mar. 19	—	—	——	272
636	2037 F. M.	M.	3	„ 24	„ 19	„ 21	—	Mild	„	—	Mar. 19	—	—	——	272
637	2039 E. D.	F.	30	„ 24	„ 21	„ 23	—	Coherent	„	—	Inf.	—	—	——	235
638	2040 A. D.	M.	29	„ 24	„ 21	„ 23	—	Discrete	„	—	Inf.	—	—	——	235
639	2041 F. L.	M.	10	„ 24	—	—	—	Mild	„	—	Inf.	—	—	——	396
640	2042 T. P.	M.	5	„ 24	Mar. 18	Mar. 20	—	Coherent	„	—	Unvaccinated		—	——	397
641	2043 A. P.	F.	15	„ 24	„ 17	„ 19	—	Mild	„	—	Inf.	—	—	——	397
642	2044 E. P.	M.	8	„ 24	„ 21	„ 23	—	Malignant	D.	Mar. 27	Unvaccinated		—	——	316
643	2045 — T.	M.	10wks.	„ 24	—	—	—	Confluent	D.	„ 30	Unvaccinated		—	——	113
644	2188 A. T.	F.	41	„ 30	—	—	—	Confluent	Rec.	—	Inf.	—	—	——	113
645	2046 B. D.	F.	28	„ 25	Mar. 21	Mar. 23	Mar. 27	Confluent	„	—	Inf.	—	—	——	398
646	2047 C. D.	M.	49	„ 25	„ 19	„ 21	—	Malignant	D.	Mar. 25	Inf.	—	—	——	399
647	2048 D. J.	F.	1 11/12	„ 25	„ 20	„ 22	—	Discrete	Rec.	—	Unvaccinated		—	——	87
648	2049 C. P.	F.	4	„ 25	„ 17	„ 22	—	Mild	„	—	Unvaccinated		—	——	216
649	2050 F. P.	M.	36	„ 25	„ 22	„ 24	—	Mild	„	—	Inf.	—	Twice, nil	——	316
650	2052 M. A. P.	F.	35	„ 25	„ 19	„ 21	—	Mild	„	—	Inf.	—	Mar. 24	——	316
651	2053 S. G.	F.	20	„ 25	„ 21	„ 23	—	Mild	„	—	Inf.	—	—	——	400

652	2057	G. A.	M.	56	„ 25	„ 21	„ 23	Mar. 30	Coherent	„	—	Inf.	2 faint	—				280
653	2055	T. V.	M.	19	„ 25	„ 23	„ 25	—	Discrete	„	—	Inf.	—	—				401
654	2056	E. P.	F.	6	„ 25	„ 15	—	—	Confluent	D.	Mar. 25	Unvaccinated		—				304
655	2058	F. M.	M.	9	„ 25	„ 22	Mar. 24	—	Confluent	D.	Apr. 3	Unvaccinated		—				395
656	2059	A. B.	F.	10	„ 25	„ 23	„ 25	Mar. 27	Coherent	Rec.	—	Unvaccinated		—				67
657	2061	B. M.	F.	4	„ 25	„ 20	„ 22	—	Coherent	„	—	Unvaccinated		—				395
658	2060	A. W.	F.	35	„ 25	„ 13	„ 15	—	Mild	„	—	Inf.	—	—				402
659	2062	F. M.	F.	8	„ 25	„ 20	„ 22	—	Discrete	„	—	Unvaccinated		—				395
660	—	A. M.	F.	28	„ 15	—	—	—	Mild	„	—	Inf.	—	—				395
661	2063	R. A.	F.	30	Mar. 25	Mar. 23	Mar. 25	Mar. 30	Confluent	„	—	Inf.	3 faint	—				280
662	2067	T. T.	M.	29	„ 26	„ 27	„ 30	—	Coherent	„	—	Inf.	—	—				242
663	2064	F. B.	F.	10	„ 25	„ 23	„ 25	Mar. 26	Confluent	D.	Apr. 1	Unvaccinated		—				403
664	—	E. B.	F.	2	—	„ 23	„ 25	„ 26	Confluent	D.	„ 2	Unvaccinated		—				403
665	2065	R. M.	M.	4	„ 26	„ 24	„ 26	—	Confluent	D.	„ 6	Mar. 19	—	—				195
666	2066	E. M.	F.	7	„ 26	„ 18	„ 20	Mar. 22	Confluent	Rec.	—	Unvaccinated		—				195
667	2072	E. W.	F.	31	„ 26	„ 19	„ 21	—	Discrete	„	—	Inf.	—	Mar. 15 (2)				269
668	2069	E. W.	F.	8	„ 26	„ 24	„ 26	Apr. 9	Coherent	„	—	Unvaccinated		—				405
669	2070	E. S.	F.	1	„ 26	—	—	—	Confluent	D.	Apr. 1	Unvaccinated		—				194
670	2079	E. N.	F.	$\frac{5}{12}$	„ 26	Mar. 19	Mar. 21	—	Confluent	Rec.	—	Unvaccinated		—				253
671	2080	E. W.	M.	11	„ 26	„ 24	„ 26	—	Mild	„	—	Inf.	—	—				276
672	2081	J. S.	M.	32	„ 26	„ 24	„ 26	—	Mild	„	—	Inf.	—	—				129
673	2083	E. C.	M.	2	„ 26	„ 21	„ 23	—	Confluent	„	—	2 days before.	—	—				146
674	2084	A. S.	M.	27	„ 26	„ 23	„ 25	—	Discrete	„	—	Inf.	—	—				281
675	2082	E. P.	F.	62	„ 26	„ 21	„ 24	—	Discrete	„	—	Inf.	—	—				406
676	2088	H. B.	M.	3 wks.	„ 26	—	—	—	Confluent	D.	Apr. 21	Unvaccinated		—				313
677	2089	R. H.	F.	11	„ 26	Mar. 22	Mar. 24	—	Discrete	Rec.	—	Inf.	—	Mar. 16				371
678	2086	W. V.	M.	12	„ 26	„ 24	„ 26	—	Mild	„	—	Inf.	2 good	—				401
679	2087	F. A.	F.	22	„ 26	—	—	—	Malignant	D.	Mar. 26	Inf.	—	—		Post partum		407
680	—	A. B.	M.	20	—	Apr. 4	Apr. 6	—	Discrete	Rec.	—	Inf.	4 plain	—				898
681	2091	F. A.	F.	6	Mar. 26	Mar. 24	Mar 26	—	Malignant	D.	Apr. 4	Unvaccinated		—		"Measly rash"		408
682	—	A. C.	M.	13	—	—	—	—	Mild	Rec.	—	Inf.	—	—		A doubtful case		412
683	2093	B. A.	F.	7	Mar. 26	Mar. 23	Mar. 25	—	Coherent	„	—	Unvaccinated		—		Very large pustules		409
684	2094	C. P.	F.	7	„ 26	„ 23	„ 26	—	Confluent	D.	Apr. 4	Unvaccinated		—				410
685	2095	E. R.	F.	3	„ 26	„ 24	„ 26	—	Confluent	Rec.	—	Unvaccinated		—				411
686	2096	A. B.	F.	33	„ 26	„ 24	„ 26	Mar. 27	Discrete	„	—	Inf.	4 faint	—		Pregnant, 8 months		271
687	2097	J. H.	M.	34	„ 26	„ 21	„ 23	—	Coherent	„	—	Inf.	—	—				272
688	2098	A. C.	M.	45	„ 26	„ 22	„ 24	—	Discrete	„	—	Inf.	—	20 years ago				412
689	2099	S. R.	F.	$\frac{5}{12}$	„ 26	—	—	—	Malignant	D.	Mar. 26	Unvaccinated		—				411
690	2100	S. F.	M.	24	„ 26	Mar. 24	Mar. 26	—	Discrete	Rec.	—	Inf.	—	—				243
691	2101	F. L.	M.	24	„ 26	„ 20	„ 23	—	Mild	„	—	Inf.	—	—				413
692	2102	M. A.	F.	20	„ 26	—	—	—	Discrete	„	—	Inf.	—	—				409
693	2104	E. G. N.	M.	7	„ 26	Mar. 24	Mar. 26	Mar. 31	Confluent	„	—	Unvaccinated		—				140
694	—	B. N.	F.	9	—	„ 26	„ 28	„ 31	Confluent	„	—	Unvaccinated		—				140
695	2105	V. M.	M.	$\frac{5}{12}$	Mar. 26	„ 26	„ 26	—	Mild	„	—	Mar. 7	—	—		A doubtful case		203
696	2106	W. S.	M.	36	„ 26	„ 24	„ 26	Mar. 30	Mild	„	—	Inf.	3 faint	—				414
697	2107	L. P.	F.	7	„ 26	„ 22	„ 24	—	Confluent	„	—	Unvaccinated		—				252
698	2555	M. W.	F.	5	Apr. 10	„ 29	Apr. 1	—	Discrete	„	—	Mar. 22	4 places	—				161
699	2109	A. J.	F.	36	Mar. 27	„ 22	Mar. 25	—	Discrete	„	—	Inf.	—	—				229
700	2110	E. M.	M.	3	„ 27	„ 25	„ 27	Mar. 29	Confluent	„	—	Unvaccinated		—				182
701	2111	A. S.	M.	47	„ 27	—	—	—	Mild	„	—	Inf.	—	—				244
702	2112	A. S.	F.	8	„ 27	Mar. 23	Mar. 26	—	Confluent	„	—	Unvaccinated		—				416
702	2113	J. R.	M.	1	„ 27	—	—	—	Confluent	D.	Apr. 3	Unvaccinated		—		Broncho pneumonia		240

No.	Name and Notification Number.	Sex.	Age.	Date of Notification.	Date of Onset.	Date of Rash.	Date of Removal to Hospital.	Type of Attack.	Result.	Date of Death.	Vaccination. Date.	Vaccination. No. of Marks.	Re-vaccination Date.	Remarks.	No. in House Register.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
				1896.											
704	2114 M. T.	F.	4	Mar. 27	Mar. 24	Mar. 25	—	Malignant	D.	Mar. 28	Unvaccinated		—	In same family another child, aged 6½, sickened on March 16, and died on 20th, from "inflammation of bowels," attributed to chill.	417
705	2115 A. W.	F.	29	„ 27	„ 22	„ 25	—	Discrete	Rec.	—	Inf.	—	Mar. 21	——	418
706	2116 M. N.	F.	5	„ 27	„ 23	„ 25	—	Confluent	„	—	Unvaccinated		—	——	225
707	2117 A. M.	F.	28	„ 27	„ 23	„ 25	—	Malignant	D.	Mar. 29	Inf.	—	—	——	225
708	2118 W. P.	M.	32	„ 27	„ 25	„ 27	—	Discrete	Rec.	—	Inf.	—	—	——	252
709	2119 Mrs. S.	F.	50	„ 27	„ 25	„ 27	—	Discrete	„	—	Inf.	—	—	——	272
710	2120 A. E.	F.	28	„ 27	„ 24	„ 25	—	Coherent	„	—	Inf.	—	—	——	304
711	2121 C. G.	M.	34	„ 27	—	—	—	Malignant	D.	Apr. 1	Inf.	—	—	Cerebral hæmorrhage	419
712	2122 E. B.	F.	7	„ 27	Mar. 25	Mar. 27	Apr. 12	Discrete	Rec.	—	Unvaccinated		—	——	420
713	2123 A. H.	M.	37	„ 27	„ 23	„ 26	—	Confluent	„	—	Inf.	—	—	——	421
714	2124 A. A.	F.	13	„ 28	„ 23	„ 24	—	Discrete	„	—	Inf.	—	—	——	294
715	2125 T. M.	M.	10/12	„ 28	—	—	—	Confluent	D.	Apr. 1	Unvaccinated		—	——	182
716	2126 A. D.	F.	11	„ 28	Mar. 25	Mar. 27	—	Discrete	Rec.	—	Inf.	—	—	——	266
717	2127 A. B.	M.	7	„ 28	—	—	—	Confluent	D.	Apr. 2	Unvaccinated		—	Double panophthalmitis	365
718	2128 T. D.	M.	9	„ 28	Mar. 25	Mar. 27	—	Confluent	Rec.	—	Unvaccinated		—	——	266
719	2129 J. D.	M.	6	„ 28	„ 25	„ 27	—	Confluent	„	—	Unvaccinated		—	——	266
720	2130 E. B.	F.	47	„ 28	„ 25	„ 27	—	Confluent	„	—	Inf.	—	—	——	265
721	2131 B. N.	F.	6	„ 28	„ 26	„ 28	Mar. 29	Discrete	„	—	Unvaccinated		—	Large pustules	170
722	2132 R. V.	M.	2	„ 28	„ 26	„ 28	Apr. 7	Discrete	„	—	Unvaccinated		—	——	401
723	— J. V.	F.	15	—	„ 29	„ 29	—	Mild	„	—	Inf.	—	—	A doubtful case	401
724	— P. V.	F.	7	—	Feb. 29	„ 2	—	Mild	„	—	Unvaccinated		—	——	401
725	2133 M. P.	F.	25	Mar. 28	Mar. 21	„ 23	—	Mild	„	—	Inf.	—	—	——	239
726	2134 E. H.	F.	35	„ 28	—	—	—	Discrete	„	—	Inf.	—	—	——	272
727	2135 L. P.	F.	49	„ 28	Mar. 22	Mar. 24	—	Discrete	„	—	Inf.	—	—	——	239
728	2136 H. B.	F.	48	„ 28	„ 27	„ 28	—	Discrete	„	—	Inf.	—	—	——	293
729	2137 A. H.	F.	33	„ 28	„ 18	„ 20	—	Mild	„	—	Inf.	—	—	——	237
730	2138 A. B.	M.	12	„ 28	„ 16	„ 18	—	Discrete	„	—	Inf.	4 faint	Mar. 13 (1 slight).	Papules various sizes; no pustules.	422
731	2139 F. B.	F.	8	„ 28	„ 26	„ 28	—	Confluent	D.	Apr. 5	Unvaccinated		—	——	293
732	2140 Mrs. H.	F.	30	„ 28	—	—	—	Confluent	D.	Mar. 28	Inf.	—	—	——	423
733	2141 A. R.	F.	26	„ 28	Mar. 27	Mar. 28	—	Coherent	Rec.	—	Inf.	—	—	——	371
734	2142 E. S.	M.	2	„ 28	„ 25	„ 27	—	Coherent	„	—	Unvaccinated		—	——	281
735	2143 W. D.	M.	28	„ 28	„ 26	„ 28	—	Confluent	„	—	Inf.	—	—	——	317
736	2144 R. P.	F.	2	„ 28	„ 22	„ 24	—	Confluent	D.	Mar. 29	Unvaccinated		—	——	397
737	2145 E. M.	F.	21	„ 28	„ 24	„ 25	—	Coherent	Rec.	—	Inf.	—	—	——	116
738	2148 H. C.	F.	34	„ 28	„ 23	„ 25	—	Discrete	„	—	Inf.	—	—	——	301
739	2146 L. C.	F.	25	„ 28	„ 23	„ 25	—	Confluent	D.	Apr. 3	Inf.	—	—	——	424
740	2147 A. P.	M.	3	„ 28	—	—	—	Confluent	D.	„ 6	Unvaccinated		—	——	425
741	2149 W. P.	M.	60	„ 28	—	—	—	Mild	Rec.	—	Inf.	—	—	——	246
742	2150 E. D.	F.	32	„ 28	Mar. 27	Mar. 28	—	Confluent	D.	Apr. 6	Inf.	—	—	——	426

743	2151	W. P.	M.	50	„	29	„	27	„	29	—	Confluent	D.	Mar.	30	Unvaccinated		—	427
744	2152	W. S.	M.	8	„	29	„	22	„	25	—	Confluent	Rec.	—		Unvaccinated		—	322
745	2153	R. F.	F.	20	„	29	„	25	„	28	—	Coherent	„	—		Inf.	—	—	428
746	2154	G. S.	F.	6	„	29	„	25	„	28	—	Confluent	D.	Apr.	6	Unvaccinated		—	429
747	2155	F. S.	F.	9	„	29	„	24	„	26	Mar. 30	Coherent	Rec.	—		Unvaccinated		—	123
748	2156	T. B.	M.	33	„	29	„	23	„	27	—	Coherent	„	—		Inf.	—	—	430
749	2158	W. A.	M.	30	„	29	„	26	„	28	Apr. 4	Coherent	„	—		Inf.	5 plain	—	280
750	—	F. A.	M.	29	—		—		—		—	Discrete	„	—		Inf.	—	—	280
751	2157	J. E.	M.	10	Mar.	29	Mar.	27	Mar.	29	—	Confluent	„	—		Unvaccinated		—	307
752	2159	F. P.	F.	29	„	29	—		—		—	Confluent	D.	Apr.	6	Inf.	—	—	297
753	2161	M. G.	F.	2	„	29	Mar.	24	Mar.	27	—	Discrete	Rec.	—		Mar. 16	4	—	431
754	2163	C. L.	F.	23	„	29	„	26	„	28	—	Confluent	„	—		Inf.	—	Yes	274
755	2164	A. P.	F.	38	„	29	„	19	„	23	—	Discrete	„	—		Inf.	—	—	432
756	2166	M. A.	F.	71	„	29	„	26	„	28	Mar. 29	Mild	„	—		Inf.	2 faint	—	433
757	2167	C. H.	M.	12	„	29	„	28	„	30	—	Mild	„	—		Inf.	—	—	434
758	2169	W. N.	M.	2	„	29	„	26	„	28	Mar. 29	Confluent	„	—		Unvaccinated		—	170
759	2170	E. A.	F.	19	„	29	„	28	„	29	—	Mild	„	—		Inf.	—	—	294
760	2172	A. G. P.	M.	7	„	29	„	27	„	29	—	Confluent	„	—		Unvaccinated		—	332
761	2173	M. O.	F.	36	„	29	„	28	„	29	—	Confluent	„	—		Inf.	—	—	435
762	2176	A. C.	F.	28	„	29	„	26	„	28	—	Mild	„	—		Inf.	—	Mar. 23	436
763	—	E. T.	M.	22	—		About Feb. 25				—	Mild	„	—		Inf.	—	Twice, *nil*	436
764	2177	E. C.	F.	43	Mar.	30	Mar.	25	Mar.	28	—	Discrete	„	—		Inf.	—	Mar. 19 (3)	437
765	2178	E. B.	F.	24	„	30	„	27	„	29	—	Coherent	„	—		Inf.	—	7 years ago	291
766	2179	A. F.	F.	26	„	30	„	26	„	28	—	Discrete	„	—		Inf.	—	—	438
767	2181	A. M.	F.	29	„	30	„	29	„	30	—	Discrete	„	—		Inf.	—	—	439
768	2182	E. G.	F.	38	„	30	„	29	„	30	—	Confluent	D.	Mar.	31	Inf.	—	Mar. 16	260
769	2183	E. C.	F.	34	„	30	„	25	„	27	—	Discrete	Rec.	—		Inf.	—	—	440
770	2185	J. S.	M.	30	„	30	„	27	„	30	—	Discrete	„	—		Inf.	—	—	441
771	2461	W. R.	M.	45	Apr.	7	Apr.	2	Apr.	2	—	Discrete	D.	Apr.	6	Inf.	—	—	"Phthisis" 962
772	2190	T. W.	M.	23	Mar.	30	Mar.	24	Mar.	27	—	Confluent	Rec.	—		Inf.	—	—	442
773	2191	Mrs. T.	F.	23	„	30	„	24	„	26	—	Discrete	„	—		Inf.	—	—	443
774	2192	L. M.	F.	5	„	30	„	26	„	28	—	Confluent	D.	Apr.	4	Mar.	21	—	444
775	2193	W. N.	M.	14	„	30	„	24	„	26	—	Mild	Rec.	—		Inf.	—	—	445
776	2194	A. C.	F.	9	„	30	„	10	„	12	—	Mild	„	—		Inf.	—	—	301
777	2195	M. C.	F.	11/12	„	30	„	23	„	25	—	Confluent	D.	Apr.	7	Unvaccinated		—	301
778	2196	C. P.	F.	7	„	30	„	22	„	24	—	Confluent	Rec.	—		Unvaccinated		—	446
779	2197	A. P.	M.	11	„	30	„	26	„	28	Mar. 30	Discrete	„	—		Inf.	—	—	447
780	2198	W. B.	M.	6	„	30	„	21	„	22	—	Confluent	„	—		Unvaccinated		—	248
781	2199	W. G.	M.	23	„	30	„	14	„	18	—	Mild	„	—		Inf.	3 foveate	—	448
782	2200	H. P.	F.	26	„	30	„	26	„	28	Mar. 30	Confluent	D.	Apr.	4	Inf.	—	—	Syphilis. Delirium. Vomiting 298
783	2201	G. S.	F.	3	„	30	—		—		—	Coherent	Rec.	—		Unvaccinated		—	449
784	2202	T. S.	M.	53	„	30	Mar.	27	Mar.	29	—	Mild	„	—		Inf.	—	—	450
785	2203	H. D.	M.	4	„	30	„	28	„	30	Apr. 14	Mild	„	—		Unvaccinated		—	451
786	2204	H. H.	M.	34	„	30	„	28	„	29	—	Discrete	„	—		Inf.	—	—	237
787	2205	B. M.	M.	9	„	30	„	22	„	24	—	Confluent	„	—		Unvaccinated		—	452
788	2206	E. M.	F.	25	„	30	„	24	„	26	—	Discrete	„	—		Inf.	—	—	453
789	2207	E. M.	M.	47	„	30	„	26	„	28	—	Coherent	„	—		Aged 12 years.	—	—	452
790	2208	B. M.	F.	5	„	30	„	22	„	24	—	Confluent	„	—		Unvaccinated		—	452
791	2209	E. G.	F.	11	„	30	„	29	„	30	—	Mild	„	—		Inf.	4 foveate	—	Very few papules 142
792	2210	E. M.	M.	9/12	„	30	„	26	„	28	—	Discrete	„	—		Unvaccinated		—	452

No.	Name and Notification Number.	Sex.	Age.	Date of Notification.	Date of Onset.	Date of Rash.	Date of Removal to Hospital.	Type of Attack.	Result.	Date of Death.	Vaccination. Date.	Vaccination. No. of Marks.	Re-vaccination Date.	Remarks.	No. in House Register.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
				1896.											
793	2211 E. E.	M.	2	Mar. 30	Mar. 25	Mar. 27	—	Coherent	Rec.	—	Mar. 18	1 vesicle	—	——	275
794	2212 J. A.	F.	1	„ 30	„ 27	„ 29	—	Confluent	„	—	Unvaccinated		—	——	407
795	2214 G. L.	F.	8	„ 31	„ 26	„ 29	—	Confluent	„	—	Unvaccinated		—	——	454
796	2215 E. C.	M.	44	„ 31	„ 28	„ 30	—	Coherent	„	—	Inf.	—	—	——	301
797	2216 W. L.	M.	58	„ 31	„ 28	„ 30	—	Confluent	„	—	Inf.	—	—	——	360
798	2217 R. L.	F.	3	„ 31	„ 26	„ 29	—	Coherent	„	—	Unvaccinated		—	——	454
799	2218 B. S.	F.	1	„ 31	„ 26	„ 28	—	Coherent	„	—	Unvaccinated		—	——	281
800	2219 M. A. W.	F.	32	„ 31	„ 25	„ 27	Mar. 31	Confluent	D.	Apr. 6	Inf.	Alleged	—	Marks not discernible	455
801	2221 C. B.	M.	11	„ 31	„ 27	„ 29	—	Confluent	Rec.	—	Unvaccinated		—	Probably contracted through an inmate of house visiting a small-pox case 14 days before he sickened.	456
802	2220 S. J. P.	M.	$\frac{8}{12}$	„ 31	„ 29	„ 31	—	Confluent	D.	Apr. 3	Unvaccinated		—	——	239
803	2222 J. H.	M.	25	„ 31	„ 25	„ 27	—	Mild	Rec.	—	Inf.	—	—	——	250
804	2223 C. G.	F.	49	„ 31	„ 25	„ 28	—	Discrete	„	—	Inf.	—	—	——	296
805	2224 L. N. G.	M.	8	„ 31	„ 26	„ 29	—	Confluent	„	—	Unvaccinated		—	——	457
806	2225 C. W.	M.	46	„ 31	„ 29	„ 31	—	Malignant	D.	Mar. 31	Inf.	4	—	——	458
807	2226 M. M.	F.	24	„ 31	„ 27	„ 30	—	Mild	Rec.	—	Inf.	—	Mar. 23	——	459
808	2227 J. W.	M.	23	„ 31	„ 30	Apr. 1	Apr. 2	Discrete	„	—	Inf.	4 faint	—	——	460
809	2228 R. L.	M.	39	„ 31	„ 27	Mar. 29	—	Mild	„	—	Inf.	—	—	——	461
810	2229 A. M.	F.	22	„ 31	„ 23	„ 27	—	Mild	„	—	Inf.	—	Mar. 17	——	462
811	2230 Mrs. T.	F.	51	„ 31	„ 27	„ 29	—	Confluent	D.	Apr. 6	Inf.	—	—	——	463
812	2231 K. L.	F.	9	„ 31	„ 28	„ 29	—	Discrete	Rec.	—	Unvaccinated		—	——	464
813	2232 L. J.	F.	24	„ 31	„ 25	„ 29	—	Discrete	„	—	Inf.	—	Mar. 29, nil.	——	465
814	2234 R. H.	F.	10	„ 31	„ 28	„ 30	—	Confluent	„	—	Unvaccinated		—	——	466
815	2235 C. C.	M.	3	„ 31	„ 28	„ 30	Apr. 1	Confluent	D.	Apr. 7	Mar. 28	—	—	Laryngitis	358
816	2236 A. B.	F.	17	„ 31	„ 28	„ 31	„ 1	Confluent	Rec.	—	Inf.	—	—	——	467
817	3338 G. M.	F.	4	May 30	May 26	May 29	—	Confluent	„	—	Unvaccinated		—	Convulsions followed immersion in bath.	1005
818	2237 A. V.	F.	17	Mar. 31	Mar. 22	Mar. 25	—	Discrete	„	—	Inf.	—	—	——	251
819	2238 E. P.	F.	1	„ 31	„ 31	Apr. 2	—	Discrete	„	—	Unvaccinated		—	——	356
820	2248 E. K.	F.	$\frac{1}{12}$	„ 31	„ 27	Mar. 29	—	Confluent	D.	Apr. 7	Unvaccinated		—	——	125
821	2240 N. K.	F.	8	„ 31	„ 29	„ 31	—	Discrete	Rec.	—	Inf.	4 large	—	Papules of various sizes	468
822	2241 F. B.	M.	11	„ 31	„ 24	„ 26	—	Mild	„	—	Inf.	4	Mar. 27	——	265
823	2242 B. B.	M.	3	„ 31	„ 27	„ 30	—	Confluent	D.	Apr. 9	Mar. 27	—	—	——	265
824	2243 A. V.	F.	39	„ 31	„ 27	„ 29	—	Coherent	Rec.	—	Inf.	—	—	——	251
825	2244 A. P.	M.	23	„ 31	„ 24	„ 26	Apr. 2	Discrete	„	—	Inf.	—	—	——	469
826	2245 — A.	M.	8 days	„ 31	—	—	—	Malignant	D.	Apr. 1	Unvaccinated		—	——	407
827	— R. K.	M.	8	„ 31	—	—	—	Coherent	Rec.	—	Mar. 1	—	—	——	125
828	2249 E. M.	F.	7	„ 31	—	—	—	Confluent	D.	Apr. 22	Unvaccinated		—	——	182
829	2250 E. P.	M.	$\frac{3}{12}$	„ 31	Mar. 29	Mar. 30	—	Confluent	D.	„ 12	Mar. 24	—	—	——	316
830	— A. E. P.	F.	13	—	„ 27	„ 29	—	Mild	Rec.	—	Inf.	4	Mar. 24	——	316
831	2251 A. M.	F.	25	Mar. 31	„ 26	„ 28	—	Mild	„	—	Inf.	—	—	——	452

832	2253	C. D.	F.	14	„	31	„	29	„	31	—	Mild	„	—	Inf.	—	—			397
833	—	L. P.	F.	7	—		—		—		—	Mild	„	—	Unvaccinated		—			397
834	2255	F. D.	M	18	Mar.	31	„	30	Apr.	1	Apr. 3	Confluent	„	—	Inf.	—	—			470
835	2256	C. T.	F.	24	Apr.	1	„	30	„	1	—	Confluent	„	—	Inf.	—	—			338
836	2257	W. H.	M.	42	„	1	„	30	„	1	Apr. 2	Malignant	D.	Apr. 4	Inf.	2 faint	—			131
837	2258	B. C.	M.	4	„	1	„	28	Mar.	30	„ 1	Confluent	D.	„ 7	Mar. 28	—	—			358
838	2360	F. L.	M.	7	„	4	Mar.	6	„	8	„ 5	Confluent	Rec.	—	Unvaccinated		—	}	Had been ill 4 weeks before it came to knowledge of authorities.	472
839	2361	M. L.	F.	6	„	4	„	6	„	8	„ 5	Discrete	„	—	Unvaccinated		—	}		472
840	—	E. M.	F.	45	—		—		—		—	Mild	„	—	Inf.	—	—			444
841	2259	L. M.	F.	7	Apr.	1	Mar.	26	Mar.	28	Apr. 2	Coherent	„	—	Unvaccinated		—			473
842	2260	W. P.	M.	46	„	1	„	30	Apr.	1	—	Malignant	D.	Apr. 3	Inf.	—	—		Suffered from asthma	342
843	2261	C. L.	M.	5	„	1	„	29	Mar.	31	—	Confluent	D.	„ 12	Unvaccinated		—			464
844	2262	A. F.	M.	30	„	1	„	27	„	29	—	Malignant	D.	„ 5	Inf.	—	—			474
845	2263	G. J.	M.	19	„	1	„	29	„	31	—	Malignant	D.	„ 2	Inf.	—	—			475
846	2264	S. V.	M.	$\frac{1}{12}$	„	1	—		—		—	Confluent	D.	Mar. 31	Unvaccinated		—			476
847	2265	T. B.	M.	34	„	1	—		—		—	Mild	Rec.	—	Inf.	—	—			477
848	2266	L. G.	F.	35	„	1	Mar.	28	Mar.	30	Apr. 3	Mild	„	—	Inf.	2 plain, 1 faint	—			318
849	2267	S. L.	F.	28	„	1	„	21	„	26	—	Confluent	„	—	Inf.	4 scars	—			478
850	2268	H. G.	M.	37	„	1	„	29	Apr.	1	Apr. 3	Discrete	„	—	Inf.	1 plain	—			318
851	3036	V. G.	F.	3	„	30	Apr.	28	„	30	May 2	Coherent	„	—	1 week before.	2 vesicles	—		Pustules of various sizes; some minute.	318
852	2269	H. E.	M.	28	„	1	Mar.	30	„	1	Apr. 4	Discrete	„	—	Inf.	2 faint	—			307
853	2270	W. S.	M.	53	„	1	—		—		—	Discrete	„	—	Inf.	—	—			479
854	2271	R. S.	M.	$\frac{1}{12}$	„	1	Mar.	28	Mar.	29	—	Confluent	„	—	Unvaccinated		—			480
855	2272	J. W.	F.	29	„	1	„	27	„	31	—	Confluent	„	—	Inf.	—	—			481
856	2273	G. H.	F.	2 wks.	„	1	—		—		—	Confluent	„	—	Unvaccinated		—			171
857	2274	G. W.	F.	23	„	1	Mar.	28	Mar.	29	—	Mild	„	—	Inf.	—	—			286
858	2275	J. B.	M.	25	„	1	„	31	Apr.	2	—	Confluent	„	—	Inf.	—	—			482
859	—	J. B.	F.	24	—		„	23	Mar.	26	—	Mild	„	—	Inf.	—	—			482
860	2276	J. H.	F.	4	Apr.	1	„	28	„	30	—	Confluent	D.	Apr. 12	Mar. 20	—	—			221
861	—	H. M.	M.	36	—		Mar.	26	„	28	—	Discrete	Rec.	—	Inf.	—	—			221
862	2277	E. V.	F.	9	Apr.	1	„	31	„	31	—	Mild	„	—	Inf.	—	—			251
863	2279	G. H.	F.	2	„	1	„	30	Apr.	1	—	Discrete	„	—	Unvaccinated		—			359
864	2281	F. W.	F.	7	„	1	„	24	Mar.	26	—	Mild	„	—	9 days before.	—	—			483
865	2282	P. J.	M.	5	„	1	„	29	„	31	—	Confluent	„	—	Unvaccinated		—			484
866	2283	A. P.	F.	16	„	1	„	28	„	30	Apr. 2	Discrete	„	—	Inf.	4 plain	—			486
867	2884	L. W.	F.	9	„	1	„	30	„	31	—	Mild	„	—	Inf.	2 faint	Mar. 25			389
868	2285	H. K.	M.	2	„	1	„	24	„	26	—	Confluent	D.	Apr. 18	Mar. 25	—	—			337
869	2286	W. P.	M.	23	„	1	„	30	Apr.	1	Apr. 4	Confluent	Rec.	—	Inf.	4 plain	—		Hæmorrhage into pustules	487
870	2287	E. W.	F.	3	„	1	„	30	„	1	—	Discrete	„	—	Unvaccinated		—			485
871	2288	F. K.	F.	5	„	1	„	25	Mar.	27	—	Discrete	„	—	Mar. 25	—	—			337
872	2289	E. S.	M.	24	„	2	„	28	„	31	—	Mild	„	—	Inf.	—	—			489
873	2290	E. S.	F.	17	„	2	Apr.	3	Apr.	5	Apr. 9	Discrete	„	—	Inf.	2 faint	—			123
874	2291	E. S.	F.	13	„	2	Mar.	31	„	2	„ 9	Mild	„	—	Inf.	4 plain	—			123
875	2292	C. H.	M.	4	„	2	„	28	Mar.	30	—	Discrete	„	—	Unvaccinated		—			490
876	2293	E. K.	F.	60	„	2	„	28	„	30	—	Coherent	„	—	Inf.	—	—			491
877	2294	J. W.	F.	42	„	2	„	31	Apr.	2	Apr. 3	Mild	„	—	Inf.	3 plain	—			488
878	2295	J. R.	M.	5	„	2	—		—		—	Coherent	„	—	Unvaccinated		—			492
879	2296	A. B.	F.	3	„	2	Mar.	30	Apr.	1	—	Coherent	„	—	Unvaccinated		—			493
880	2297	D. N.	M.	6	„	2	„	26	Mar.	28	—	Confluent	D.	Apr. 10	Unvaccinated		—			303
881	2299	G. N.	M.	8	„	2	„	26	„	28	—	Confluent	D.	„ 10	Unvaccinated		—			303

No.	Name and Notification Number.	Sex.	Age.	Date of Notification.	Date of Onset.	Date of Rash.	Date of Removal to Hospital.	Type of Attack.	Result.	Date of Death.	Vaccination. Date.	Vaccination. No. of Marks.	Re-vaccination Date.	Remarks.	No. in House Register.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
				1896.											
882	2299 E. J.	F.	21	Apr. 2	Mar. 30	Apr. 1	—	Mild	Rec.	—	Inf.	—	—	Attempt at re-vaccination one month ago; result nil.	369
883	2300 J. T.	M.	5	,, 2	,, 30	,, 1	—	Confluent	,,	—	Unvaccinated		—		357
884	2301 E. C.	F.	5	,, 2	,, 29	,, 2	Apr. 4	Confluent	,,	—	Mar. 28	—	—	Double panopthalmitis; a most severe case.	358
885	2302 L. R.	F.	24	,, 2	,, 30	,, 1	—	Discrete	,,	—	Inf.	—	—		494
886	2303 A. B.	M.	5	,, 2	,, 26	Mar. 28	—	Confluent	,,	—	Unvaccinated		—		495
887	2304 J. O.	M.	14	,, 2	—	—	—	Mild	,,	—	Inf.	—	Apr. 9		496
888	2305 G. S.	M.	43	,, 2	Mar. 28	Mar. 30	Apr. 3	Confluent	,,	—	Inf.	3 faint	—		497
889	2306 A. G.	M.	16	,, 3	,, 30	Apr. 2	—	Confluent	,,	—	Inf.	—	—		493
890	2317 A. F. P.	F.	6/12	,, 3	,, 27	Mar. 29	—	Discrete	,,	—	Unvaccinated		—	Subject to eczema	501
891	2308 T. M.	M.	4	,, 3	,, 28	,, 30	Apr. 2	Confluent	,,	—	Unvaccinated		—		289
892	2309 R. J. R.	F.	37	,, 3	—	—	—	Discrete	,,	—	Unvaccinated		—	Said to have had small-pox in childhood; no marks of vaccination.	324
893	2310 E. B.	F.	32	,, 3	Mar. 29	Mar. 31	—	Coherent	,,	—	Inf.	—	—		324
894	2312 L. B.	M.	4	,, 3	,, 30	Apr. 1	—	Confluent	D.	Apr. 5	Unvaccinated		—		324
895	2313 W. M.	M.	8	,, 3	,, 29	Mar. 31	Apr. 2	Mild	Rec.	—	Unvaccinated		—	Simulating varicella	289
896	2314 J. M.	F.	10	,, 3	,, 29	,, 31	,, 2	Mild	,,	—	Inf.	—	—		289
897	2315 L. M.	F.	2	,, 3	Mar. 28	Mar. 30	,, 2	Confluent	D.	Apr. 30	Unvaccinated		—	Tuberculous disease of bone and glands. Comatose for a week before death. ? Meningitis.	289
898	2316 M. S.	F.	13	,, 3	,, 27	,, 29	—	Discrete	Rec.	—	Inf.	—	—		220
899	2307 W. H.	M.	6	,, 3	Apr. 1	Apr. 3	Apr. 8	Malignant	D.	Apr. 9	Unvaccinated		—		499
900	2318 W. P.	M.	9	,, 3	,, 1	,, 3	—	Discrete	Rec.	—	Unvaccinated		—		332
901	2319 K. P.	F.	11	,, 3	,, 1	,, 3	—	Confluent	D.	Apr. 15	Unvaccinated		—		332
902	2320 E. P.	F.	13	,, 3	,, 1	,, 3	—	Discrete	Rec.	—	Unvaccinated		—		332
903	2322 W. R.	M.	29	,, 3	,, 1	,, 3	—	Discrete	,,	—	Inf.	—	—		349
904	2323 J. G.	M.	29	,, 3	Mar. 28	,, 1	—	Discrete	,,	—	Inf.	—	—		500
905	2324 A. M.	F.	28	,, 3	Apr. 4	,, 6	Apr. 7	Confluent	D.	Apr. 11	Unvaccinated		—	3 attempts at vaccination without result.	473
906	2325 K. C.	F.	19	,, 3	Mar. 31	,, 2	,, 4	Discrete	Rec.	—	Inf.	3 foveate	—		358
907	2326 J. G.	F.	29	,, 3	Apr. 1	,, 3	,, 7	Confluent	,,	—	Inf.?	No marks	—		506
908	2327 F. W.	F.	13	,, 3	Mar. 31	,, 2	—	Confluent	,,	—	Unvaccinated		—		504
909	2328 E. P.	F.	30	,, 3	Apr. 1	,, 4	—	Confluent	,,	—	Unvaccinated		—		502
910	2329 J. H.	M.	30	,, 3	—	—	—	Confluent	D	Apr. 13	Inf.	—	—		503
911	2330 E. A.	F.	38	,, 3	Mar. 30	Apr. 1	—	Discrete	Rec.	—	Inf.	—	March 29 (4)		376
912	2331 K. O.	F.	9	,, 3	—	—	—	Confluent	,,	—	Unvaccinated		—		505
913	2334 J. E.	F.	33	,, 3	Apr. 1	Apr. 3	Apr. 4	Mild	,,	—	Inf.	4 plain	—		307
914	2335 G. L.	M.	1/12	,, 3	Mar. 29	Mar. 31	—	Malignant	D.	Apr. 5	Unvaccinated		—		370
915	2336 W. W.	M.	52	,, 4	,, 31	Apr. 2	—	Confluent	D.	,, 7	Inf.	—	—		285
916	2337 E. P.	F.	4	,, 4	,, 29	,, 2	Apr. 9	Coherent	Rec.	—	Mar. 31	—	—		297
917	— F. M.	M.	17	—	—	—	—	Mild	,,	—	Inf.	—	—		444
918	2340 F. H.	M.	6	Apr. 4	Mar. 28	Apr. 2	—	Coherent	,,	—	Unvaccinated		—		507

919	2341	E. B.	M.	26	"	4	Mar. 30	Apr. 1	Apr. 8	Malignant	D.	Apr. 13	Inf.	?	—	Marks not discernible	508
920	2343	L. M.	F.	$\frac{6}{12}$	"	4	—	—	—	Confluent	D.	" 4	Unvaccinated		—		289
921	2344	E. M.	F.	17	"	4	Apr. 1	Apr. 3	—	Coherent	Rec.	—	Inf.	—	—		509
922	2345	M. M.	F.	12	"	4	Mar. 31	" 2	—	Coherent	"	—	Inf.	4 large	—		510
923	2346	P. W.	M	3	"	4	" 29	" 1	—	Confluent	"	—	Unvaccinated		—		511
924	2347	S. A.	F.	52	"	4	Apr. 1	" 3	—	Confluent	"	—	Inf.	—	—		512
925	2348	A. C.	F.	5	"	4	—	—	—	Confluent	D.	Apr. 13	Unvaccinated		—		513
926	2349	W. T.	M.	18	"	4	Apr. 2	Apr. 4	Apr. 7	Mild	Rec.	—	At 2 yrs. of age.	4 plain	—		514
927	2350	E. W.	F.	19	"	4	Mar. 25	" 2	—	Discrete	"	—	Inf.	—	—		515
928	2351	H. D.	M.	9	"	4	—	—	—	Mild	"	—	Inf.	—	—		516
929	2352	E. R.	F.	29	"	4	Mar. 28	Apr. 3	—	Mild	"	—	Inf.	4 scars	—		517
930	2353	A. A.	M.	9	"	4	Apr. 2	" 4	—	Confluent	"	—	Unvaccinated		—		518
931	2354	G. E.	M.	$\frac{9}{12}$	"	4	" 1	" 3	—	Confluent	D.	Apr. 9	Unvaccinated		—		519
932	2355	A. N.	F.	5	"	4	" 1	" 3	—	Confluent	Rec.	—	Unvaccinated		—		303
933	2356	H. P.	M.	28	"	4	—	—	—	Confluent	D.	Apr. 17	Inf.	—	—		520
934	2357	T. R. R.	M.	30	"	4	—	—	—	Mild	Rec.	—	Inf.	—	—		521
935	2358	B. P.	F.	15	"	4	Apr. 2	Apr. 4	Apr. 7	Mild	"	—	Inf.	2 foveate	—		522
936	2359	J. H. F.	M.	56	"	4	—	—	—	Discrete	"	—	Inf.	—	Mar. 27		523
937	2362	C. P.	M.	22	"	4	—	—	—	Confluent	D.	Apr. 11	Inf.	—	—		524
938	2363	L. M. H.	F.	9	"	5	Apr. 1	Apr. 3	Apr. 6	Confluent	Rec.	—	Unvaccinated		—		525
939	2364	K. C.	F.	35	"	5	Mar. 31	" 3	—	Mild	"	—	Inf.	—	20 years ago		526
940	2365	E. P.	F.	27	"	5	" 29	" 4	—	Mild	"	—	Inf.	—	—		527
941	2366	C. J.	F.	22	"	5	Apr. 3	" 5	Apr. 7	Mild	"	—	Inf.	2 plain (r) 2 plain (l)	—		528
942	2367	E. J.	M.	23	"	5	—	—	—	Mild	"	—	Inf.	—	—		529
943	2368	S. O.	M.	7	"	5	Apr. 1	Apr. 3	—	Malignant	D.	Apr. 8	Unvaccinated		—		530
944	2369	M. C.	F.	13	"	5	" 3	" 5	—	Confluent	Rec.	—	Inf.	4 large scars	—		526
945	2370	W. F.	M.	22	"	5	" 2	" 4	Apr. 5	Coherent	"	—	Inf.	1 plain 1 faint	—		531
946	2371	J. C. M.	M.	20	"	5	Mar. 31	" 2	—	Malignant	D.	Apr. 4	Unvaccinated		—	Information from neighbours	532
947	2372	A. W.	M.	21	"	5	" 31	" 2	—	Discrete	Rec.	—	Inf.	4 foveate	—		533
948	2373	J. N.	F.	16	"	5	Apr. 2	" 4	Apr. 6	Mild	"	—	Inf.	—	—		534
949	2374	F. G.	F.	5	"	5	—	—	—	Confluent	"	—	Unvaccinated		—		535
950	2375	J. M.	M.	18	"	5	Apr. 3	Apr. 5	Apr. 6	Mild	"	—	Inf.	—	—		536
951	2376	J. C.	M.	32	"	5	" 2	" 4	" 6	Confluent	D.	Apr. 15	Inf.	4 faint	—	Hæmorrhage into pustules	391
952	2377	A. C.	F.	2	"	5	" 2	" 4	—	Discrete	Rec.	—	Mar. 25	—	—	Papules of various sizes	391
953	2378	G. W.	F.	2	"	5	" 2	" 4	—	Confluent	"	—	Unvaccinated		—		161
954	2379	A. W.	F.	$\frac{1}{12}$	"	5	" 2	" 4	—	Confluent	D.	May 1	Unvaccinated		—		161
955	2380	P. (Infant)	M.	8 days	"	5	—	—	—	Malignant	D.	Apr. 4	Unvaccinated		—		297
956	2383	L. R.	F.	29	"	5	Apr. 3	Apr. 5	Apr. 7	Confluent	Rec.	—	Inf.	5 plain	—		537
957	2384	P. R.	M.	8	"	5	" 2	" 4	" 7	Confluent	"	—	Unvaccinated		—		537
958	2386	H. N.	M.	27	"	5	Mar. 30	" 1	—	Mild	"	—	Inf.	3 good	—		366
959	2387	L. H.	F.	4	"	5	Apr. 1	" 3	Apr. 8	Malignant	D.	Apr. 10	Unvaccinated		—		499
960	2388	M. H.	F.	2	"	5	" 1	" 3	" 8	Confluent	D.	" 12	Unvaccinated		—	With hæmorrhage	499
961	2389	E. B.	F.	55	"	5	" 1	" 3	—	Discrete	Rec.	—	Inf.	—	—		433
962	2390	L. L.	F.	15	"	5	" 2	" 4	Apr. 7	Mild	"	—	Inf.	3 plain	Mar. 31 (4)		539
963	2391	M. W.	F.	6	"	5	" 4	" 5	—	Coherent	"	—	Mar. 25	—	—		389
964	2392	W. W.	M.	42	"	5	" 3	" 4	—	Discrete	"	—	Inf.	—	Mar. 25		389
965	2393	F. W.	M.	10	"	5	" 4	" 6	—	Discrete	"	—	Inf.	2 plain	Mar. 25		389
966	2394	R. M.	F.	56	"	5	Mar. 29	" 1	—	Discrete	"	—	Inf.	—	—		362
967	2395	E. D.	F.	12	"	5	" 30	" 1	—	Discrete	"	—	Inf.	—	—		538
968	2396	M. S.	F.	24	"	5	Apr. 1	" 4	—	Confluent	"	—	Inf.	—	—		538
969	2397	E. B.	F.	27	"	6	Mar. 29	Mar. 31	Apr. 6	Confluent	"	—	Inf.	?	—	Marks not discernible	540

No.	Name and Notification Number.	Sex.	Age.	Date of Notification.	Date of Onset.	Date of Rash.	Date of Removal to Hospital.	Type of Attack.	Result.	Date of Death.	Vaccination. Date.	Vaccination. No. of Marks.	Re-vaccination Date.	Remarks.	No. in House Register.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
				1896.											
970	2398 A. C.	F.	19	Apr. 6	Apr. 3	Apr. 5	Apr. 6	Discrete	Rec.	—	Inf.	3 foveate	—	—	541
971	2399 J. R. E.	M.	28	„ 6	„ 3	„ 5	„ 6	Confluent	D.	Apr. 10	Unvaccinated		—	Vaccinated April 1. Nil	148
972	2400 L. H.	F.	14	„ 6	—	—	—	Mild	Rec.	—	Inf.	—	—	—	542
973	2401 F. T.	F.	31	„ 6	Apr. 1	Apr. 3	—	Discrete	„	—	Inf.	—	—	—	394
974	2402 J. L.	M.	28	„ 6	„ 1	„ 3	—	Mild	„	—	Inf.	—	Apr. 2. Nil	—	543
975	2403 P. S.	M.	4	„ 6	„ 6	„ 8	Apr. 12	Confluent	D.	Apr. 14	Unvaccinated		—	With hæmorrhage	544
976	2404 R. R.	M.	53	„ 6	—	—	—	Mild	Rec.	—	At 8 yrs.	—	—	—	545
977	2405 J. F.	M.	34	„ 6	Apr. 2	Apr. 5	—	Coherent	„	—	Inf.	—	Aged 14. Nil	—	546
978	2406 L. P.	F.	32	„ 6	—	—	—	Confluent	„	—	Inf	—	—	—	547
979	— M. W.	F.	6	—	Apr. 6	Apr. 8	—	Confluent	„	—	Unvaccinated		—	—	739
980	2408 S. H.	F.	52	Apr. 6	—	—	—	Discrete	„	—	Inf.	—	—	—	549
981	2409 J. D.	M.	38	„ 6	Apr. 5	Apr. 7	Apr. 8	Confluent	„	—	Inf.	2 plain	—	Petechiæ	550
982	2410 G. P.	F.	8	„ 6	„ 2	„ 4	—	Confluent	„	—	Unvaccinated		—	—	502
983	2411 S. Y.	M.	19	„ 6	—	—	—	Confluent	„	—	Unvaccinated		—	—	551
984	2412 H. R.	M.	1 7/12	„ 6	„ 3	Apr. 5	—	Coherent	„	—	Unvaccinated		—	—	552
985	2413 G. D.	M.	8	„ 6	„ 4	„ 6	Apr. 7	Confluent	„	—	Unvaccinated		—	—	553
986	2414 G. P.	M.	25	„ 6	„ 4	„ 6	—	Coherent	„	—	Inf.	—	—	—	554
987	2415 S. S.	F.	66	„ 6	„ 1	„ 3	—	Mild	„	—	Inf.	—	—	—	344
988	2416 M. B.	F.	22	„ 6	„ 3	„ 5	—	Coherent	„	—	Inf.	—	—	—	555
989	2417 F. H.	M.	34	„ 6	„ 4	„ 6	—	Discrete	„	—	Inf.	—	—	—	576
990	2418 W. P.	M.	8	„ 6	Mar. 30	„ 1	Apr. 9	Confluent	„	—	Unvaccinated		—	—	557
991	2419 F. A.	F.	15	„ 6	Apr. 3	„ 6	—	Mild	„	—	Inf.	—	—	—	96
992	2420 E. B.	F.	15	„ 6	„ 3	„ 5	—	Mild	„	—	Inf.	4 good	—	—	223
993	2421 A. A.	F.	8	„ 6	„ 3	„ 6	—	Confluent	„	—	Unvaccinated		—	—	96
994	2422 A. H.	M.	6	„ 6	—	—	—	Confluent	D.	Apr. 11	Unvaccinated		—	—	558
995	2423 L. G.	F.	42	„ 6	Apr. 4	Apr. 6	Apr. 9	Discrete	Rec.	—	Inf	1 good	—	—	559
996	2424 C. L.	F.	5/12	„ 6	„ 3	„ 5	—	Mild	„	—	Unvaccinated		—	—	320
997	2425 A. L.	F.	22	„ 6	Mar. 27	Mar. 29	—	Discrete	„	—	Inf.	—	—	—	320
998	2426 M. O.	F.	37	„ 6	Apr. 3	Apr. 5	Apr. 7	Coherent	„	—	Inf.	No marks visible.	—	Large indurated papules	560
999	2428 E. H.	F.	9	„ 6	Mar. 29	Mar. 31	„ 7	Confluent	D.	Apr. 16	Unvaccinated		—	—	561
1000	2429 G. H.	F.	7	„ 6	Mar. 30	Apr. 1	„ 7	Confluent	D.	„ 10	Apr. 1	—	—	—	561
1001	2430 B. W.	F.	67	„ 7	Apr. 4	„ 6	„ 7	Mild	Rec.	—	Inf.	No marks	—	Small-pox at age of 12 years	562
1002	2431 J. R.	M.	9	„ 7	Mar. 26	Mar. 28	„ 4	Confluent	„	—	Unvaccinated		—	—	507
1003	2432 G. T.	F.	2	„ 7	Apr. 3	Apr. 5	—	Discrete	„	—	Unvaccinated		—	—	417
1004	2436 L. M.	F.	26	„ 7	—	—	—	Coherent	„	—	Inf.	4	Mar. 23	—	462
1005	2437 W. H.	M.	29	„ 7	Apr. 2	Apr. 4	Apr. 9	Mild	„	—	Inf.	3 plain	—	—	563
1006	2438 E. J.	F.	18	„ 7	„ 3	„ 5	—	Mild	„	—	Inf.	4 scars	—	—	564
1007	2439 W. M.	M.	19	„ 7	„ 1	„ 3	Apr. 6	Mild	„	—	Inf.	3 foveate	—	—	536
1008	2440 F. L.	F.	8	„ 7	„ 5	„ 7	—	Mild	„	—	Inf.	4 foveate	—	—	415
1009	2441 B. C.	F.	4	„ 7	„ 2	„ 4	—	Discrete	„	—	Mar. 26	—	—	—	391
1010	2442 E. C.	M.	5	„ 7	„ 5	„ 7	—	Mild	„	—	10 days before.	—	—	—	391
1011	2443 R. L.	M.	67	„ 7	„ 2	„ 4	—	Coherent	„	—	Inf.	—	—	—	565

1012	2444	E. T.	M.	20	„	7	„	4	„	6	—	Discrete	„	—	Inf.	—	—	——	565
1013	2446	F. A. P.	F.	5	„	7	„	3	„	5	—	Confluent	D.	Apr. 19	Unvaccinated		—	Vaccinated; day of onset (Apr. 3).	220
1014	2447	J. E.	M.	17	„	7	„	5	„	7	—	Discrete	Rec.	—	Unvaccinated		—	——	341
1015	2448	R. M.	F.	4	„	7	„	4	„	7	—	Confluent	D.	Apr. 16	Unvaccinated		—	——	560
1016	2449	G. J.	M.	8	„	7	„	5	„	6	Apr. 9	Confluent	D.	„ 16	Unvaccinated		—	——	566
1017	2450	H. L.	M.	27	„	7	„	5	„	7	—	Discrete	Rec.	—	Inf.	—	—	——	565
1018	2451	C. W.	F.	28	„	7	„	4	„	6	—	Malignant	D.	Apr. 6	Inf.	—	—	Recent parturition	567
1019	2452	— W.	M	2 days	„	7	„	6	„	7	—	Malignant	D.	„ 6	Unvaccinated		—	No rash	567
1020	2453	A. W.	F.	4	„	7	„	3	„	5	—	Confluent	Rec.	—	Unvaccinated		—	——	568
1021	2454	W. H.	M.	6	„	7	„	3	„	5	Apr. 8	Confluent	D.	Apr. 26	Unvaccinated		—	Hæmorrhages into pustules	569
1022	2455	M. L.	F.	38	„	7	—		—		—	Mild	Rec.	—	Inf.	—	—	——	570
1023	2458	W. H.	M.	30	„	7	Apr. 5		Apr. 7		Apr. 8	Confluent	D.	Apr. 15	Inf.	2 faint	—	Hæmorrhages into pustules	499
1024	2536	J. B.	M.	51	„	10	„ 9		„ 10		—	Confluent	D.	„ 20	Inf.	—	—	——	571
1025	2462	A. W.	M.	45	„	7	Mar. 26		„ 1		—	Discrete	Rec.	—	Inf.	—	—	——	572
1026	2463	C. A.	M.	50	„	7	Apr. 4		„ 6		—	Discrete	„	—	Inf.	—	—	——	573
1027	2464	J. C.	M.	15	„	7	—		—		—	Mild	„	—	Inf.	—	—	——	574
1028	2466	A. B.	M.	39	„	7	Apr. 5		Apr. 8		Apr. 8	Malignant	D.	Apr. 13	Unvaccinated		—	Not strong since influenza. Told his wife he had never been vaccinated.	575
1029	2467	A. W. C.	M.	48	„	7	—		—		—	Mild	Rec.	—	Inf.	—	—	——	576
1030	2468	M. E.	F.	9	„	7	Apr. 4		Apr. 6		Apr. 9	Coherent	„	—	Unvaccinated		—	——	577
1031	2469	G. C.	M.	24	„	7	—		—		—	Mild	„	—	Inf.	—	—	Said to have had small-pox in infancy.	578
1032	2470	S. V.	F.	44	„	7	Apr. 3		Apr. 6		—	Discrete	„	—	Inf.	—	—	——	476
1033	2471	M. S.	F.	23	„	7	„ 3		„ 7		—	Mild	„	—	Inf.	—	—	——	579
1034	2472	J. S.	M.	49	„	7	„ 6		„ 7		—	Mild	„	—	Inf.	Jan. 1896 Nil.	—	Eruption disappearing rapidly	580
1035	2473	C. P.	F.	48	„	7	„ 6		„ 8		—	Confluent	„	—	Inf.	—	Jan. 1896. No result.	Large indurated papules	581
1036	2474	L. K.	F.	19	„	7	—		—		—	Mild	„	—	Inf.	—	—	——	582
1037	2475	A. H.	M.	53	„	8	Apr. 6		Apr. 8		—	Confluent	D.	Apr. 16	Inf.	—	—	——	583
1038	2476	J. W.	M.	32	„	8	—		—		—	Confluent	Rec.	—	Inf.	—	—	——	584
1039	2477	J. P.	M.	14	„	8	—		—		—	Mild	„	—	Inf.	—	—	——	584
1040	2478	G. E.	M.	65	„	8	Apr. 6		Apr. 8		—	Confluent	D.	Ap. 18	Inf.	—	—	Hæmorrhage into pocks	585
1041	2479	W. W.	M.	35	„	8	„ 5		„ 7		Apr. 8	Confluent	D.	„ 12	Aged 9 years.	2 plain	7 years ago, in army.	Hæmorrhage into pocks	586
1042	2480	E. W.	F.	26	„	8	„ 2		„ 4		—	Coherent	Rec.	—	Unvaccinated		—	Does not think she had been vaccinated. There are no marks.	587
1043	2481	E. K.	F.	26	„	8	„ 3		„ 5		—	Discrete	„	—	Inf.	—	—	——	588
1044	2482	A. C.	F.	53	„	8	—		—		—	Confluent	„	—	Inf.	—	—	——	589
1045	2483	M. C.	F.	11	„	8	—		—		—	Mild	„	—	Inf.	—	—	——	590
1046	2484	C. J.	F.	20	„	8	Apr. 5		Apr. 7		—	Discrete	„	—	Inf.	—	—	——	591
1047	2485	C. S.	M.	18	„	8	„ 3		„ 5		Apr. 9	Mild	„	—	Inf.	4 plain	—	——	592
1048	2486	L. P.	F.	39	„	8	—		—		—	Confluent	D.	Apr. 16	Inf.	—	Mar. 21, 1896	——	593
1049	2487	E. J.	F.	17	„	8	—		—		—	Mild	Rec.	—	Inf.	—	—	——	594
1050	2188	F. G.	F.	½	„	8	Mar. 30		Apr. 2		—	Confluent	D.	Apr. 10	Unvaccinated		—	——	288
1051	2489	F. B.	M.	2	„	8	Apr. 1		„ 3		Apr. 9	Confluent	D.	„ 13	Unvaccinated		—	——	595
1052	2491	E. G.	F.	28	„	8	—		—		—	Confluent	D.	„ 13	Inf.	—	—	——	596
1053	2492	J. B.	M.	8	„	8	Apr. 8		Apr. 10		Apr. 12	Mild	Rec.	—	Inf.	2 faint	—	——	420
1054	2493	L. R.	F.	20	„	8	—		„ 2		—	Confluent	„	—	Inf.	4 large foveate.	—	A teacher at Tredworth Board School.	597
1055	2494	T. C.	M.	34	„	8	—		—		—	Mild	„	—	Inf.	—	—	——	598

No.	Name and Notification Number.	Sex.	Age.	Date of Notification.	Date of Onset.	Date of Rash.	Date of Removal to Hospital.	Type of Attack.	Result.	Date of Death.	Vaccination. Date.	Vaccination. No. of Marks.	Re-vaccination Date.	Remarks.	No. in House Register.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
				1896.											
1056	2495 M. R.	F.	3	Apr. 8	—	—	—	Confluent	Rec.	—	Unvaccinated		—	—	599
1057	2496 K. D.	F.	32	„ 8	Apr. 7	Apr. 9	—	Confluent	„	—	Inf.	—	—	—	600
1058	2497 G. S.	M.	36	„ 8	„ 7	„ 9	Apr. 12	Malignant	D.	Apr. 16	Inf.	Not discernible.	—	—	601
1059	2498 W. C.	M.	4	„ 8	„ 3	„ 5	„ 12	Confluent	D.	„ 18	Unvaccinated		—	—	602
1060	2499 A. W.	F.	24	„ 8	„ 1	„ 3	—	Mild	Rec.	—	Inf.	—	—	—	603
1061	2500 T. B.	M.	27	„ 9	—	—	—	Mild	„	—	Inf.	—	—	—	604
1062	2502 G. H. S.	M.	5	„ 9	Apr. 2	Apr. 4	—	Coherent	„	—	Unvaccinated		—	—	605
1063	2503 A. G.	F.	8	„ 9	„ 7	„ 8	—	Confluent	„	—	Unvaccinated		—	Said to have been 3 times vaccinated unsuccessfully.	606
1064	2504 H. S.	M.	44	„ 9	„ 31	„ 2	—	Coherent	„	—	Inf.	—	Mar. 28	—	605
1065	2505 S. H.	F.	52	„ 9	„ 2	„ 5	—	Confluent	„	—	Inf.	—	Mar 27 (3)	—	361
1066	2506 E. G.	M.	40	„ 9	„ 8	„ 9	—	Discrete	„	—	Inf.	—	—	—	607
1067	2507 E. R.	F.	45	„ 9	—	—	—	Discrete	„	—	Inf.	—	—	—	608
1068	2508 M. B.	F.	25	„ 9	Apr. 5	Apr. 7	Apr. 9	Confluent	„	—	Inf.	3 faint	—	—	609
1069	2509 E. C.	F.	40	„ 9	„ 7	„ 9	—	Mild	„	—	Inf.	—	—	—	412
1070	2510 E. P.	F.	36	„ 9	—	—	Apr. 12	Coherent	„	—	Inf.	—	—	Eruption rapidly desiccated	610
1071	2511 T. C.	M.	22	„ 9	—	—	—	Confluent	„	—	Inf.	—	—	—	611
1072	— T. C.	M.	48	—	—	—	—	Discrete	„	—	Inf.	—	—	—	611
1073	2512 F. A. W.	M.	10	Apr. 9	Apr. 6	Apr. 8	—	Confluent	„	—	Inf.	4 good	—	—	612
1074	2513 S. L.	F.	33	„ 9	—	—	—	Malignant	D.	Apr. 10	?	—	—	—	613
1075	2514 A. M.	M.	37	„ 9	Apr. 5	Apr. 7	—	Discrete	Rec.	—	Inf.	—	13 years ago	—	560
1076	2515 A. M.	F.	2	„ 9	„ 6	„ 8	—	Confluent	D.	Apr.	Unvaccinated		—	—	560
1077	2516 J. H.	M.	36	„ 9	„ 2	„ 4	—	Mild	Rec.	—	Inf.	—	Apr. 18 (2 places).	Not half-dozen "spots"; re-vaccination *after* attack.	614
1078	2517 M. E.	F	13	„ 9	„ 7	„ 9	—	Mild	„	—	Inf.	—	Attempt failed	—	341
1079	2518 M. J.	F	37	„ 9	„ 7	„ 9	—	Confluent	„	—	Inf.	—	—	—	369
1080	2870 P. J.	M.	14 days.	„ 21	—	—	—	Confluent	D.	Apr. 23	Unvaccinated		—	—	369
1081	2519 C. W.	M.	49	„ 9	—	—	—	Discrete	Rec.	—	Inf.	—	—	—	615
1082	2520 W. M.	M.	34	„ 10	—	—	—	Discrete	„	—	Inf.	—	—	—	617
1083	2521 H. D.	M.	18	„ 10	Apr. 7	Apr. 9	Apr. 11	Discrete	„	—	Inf.	4 plain	Apr. 1 (2).	—	618
1084	2522 S. M.	M.	53	„ 10	„ 7	„ 9	„ 11	Malignant	D.	Apr. 12	Inf.	Not discernible.	—	—	619
1085	2523 J. H.	M.	20	„ 10	„ 4	„ 6	—	Confluent	D.	„ 22	Inf.	4 scars	—	—	620
1086	2524 A. S.	F.	19	„ 10	„ 8	„ 9	—	Mild	Rec.	—	Inf.	—	Apr. 7, no result.	—	580
1087	2525 C. R.	M.	26	„ 10	„ 8	„ 10	Apr. 13	Confluent	„	—	Inf.	Not discernible.	—	—	621
1088	2526 W. H.	M.	42	„ 10	„ 6	„ 8	„ 11	Malignant	D.	Apr. 14	Inf.	1 faint	—	—	622
1089	2527 P. K.	F	½	„ 10	Mar. 31	„ 2	—	Discrete	Rec.	—	Mar. 25	—	—	—	337
1090	2528 A. B.	M.	13	„ 10	Apr. 3	„ 4	—	Mild	„	—	Inf.	—	Apr. 3 (1).	—	623
1091	2529 A. W.	M.	24	„ 10	—	—	—	Discrete	„	—	Inf.	—	—	—	624
1092	2530 H. G.	M.	19	„ 10	Apr. 9	Apr. 10	—	Mild	„	—	Inf.	—	—	—	625

1093	2531	G. R. H.	F.	32	„	10	„	2	„	7	—	Discrete	„	—	Inf.	—	—	—	626
1094	2532	A. M.	M.	1	„	10	„	8	„	10	—	Discrete	„	—	Unvaccinated		—	—	64
1095	2533	E. M. L.	F.	15	„	10	—		—		—	Mild	„	—	Inf.	—	Mar. 20	—	627
1096	2534	E. T.	F.	18	„	10	—		—		Apr. 11	Coherent	„	—	Inf.	foveate	—	Eruption aborted	616
1097	2535	L. R.	M.	2	„	10	—		—		—	Confluent	„	—	Unvaccinated		—	—	608
1098	2537	H. D.	F.	24	„	10	Apr.	7	Apr.	9	Apr. 14	Mild	„	—	Inf.	4 plain	—	—	451
1099	2538	A. M. W.	F.	23	„	10	—		—		—	Mild	„	—	Inf.	—	—	—	623
1100	2540	W. H.	M.	14	„	10	Apr.	3	Apr.	5	—	Discrete	„	—	Inf.	3 good, 1 small.	Mar. 21	Infected through wall-paper of infected house.	629
1101	2541	G. P.	M.	43	„	10	—		—		—	Discrete	„	—	Inf.	—	—	—	432
1102	2542	A. P.	F.	19	„	10	Apr.	3	Apr.	5	Apr. 17	Coherent	„	—	Unvaccinated		—	Attempt at vaccination, 2 months ago; failed.	432
1103	2543	F. P.	M.	6	„	10	„	8	„	10	—	Malignant	D.	Apr. 14	Unvaccinated		—	—	432
1104	2544	A. P.	M.	3	„	10	„	9	„	11	Apr. 17	Confluent	Rec.	—	Unvaccinated		—	—	432
1105	2545	M. P.	F.	[illegible]	„	10	„	7	„	9	—	Malignant	D.	Apr. 11	Unvaccinated		—	—	432
1106	2546	M. A. L.	F.	19	„	10	„	8	„	10	—	Discrete	Rec.	—	Inf.	—	—	—	565
1107	—	A. L.	M.	15	—		„	10	„	11	—	Mild	„	—	Inf.	4 foveate	—	—	565
1108	2547	A. P.	F.	2	Apr.	10	„	7	„	9	—	Confluent	D.	Apr. 17	Unvaccinated		—	—	502
1109	2548	A. P.	M.	28	„	10	„	7	„	9	—	Mild	Rec.	—	Inf.	—	18 years	Has 8 vaccination cicatrices	502
1110	2549	M. A. W.	F.	36	„	10	Mar.	31	„	2	Apr. 9	Confluent	„	—	Inf.	—	—	—	405
1111	2550	R. A.	M.	19	„	10	—		—		—	Mild	„	—	Inf.	—	—	—	409
1112	2552	E. T.	F.	32	„	10	Apr.	7	Apr.	9	—	Coherent	„	—	Inf.	—	Aged 14	—	630
1113	2553	A. P.	F.	60	„	10	—		—		—	Mild	„	—	Inf.	—	—	—	631
1114	2554	E. R.	F.	4	„	10	Apr.	6	Apr.	9	—	Confluent	„	—	Unvaccinated		—	—	632
1115	2556	A. W.	F.	19	„	10	„	5	„	7	—	Mild	„	—	Inf.	—	—	—	485
1116	2557	E. W.	F.	4	„	10	Mar.	29	Mar.	31	—	Confluent	„	—	Unvaccinated		—	—	485
1117	—	M. W.	F.	9	—		„	17	„	19	—	Coherent	„	—	Inf.	—	—	—	405
1118	2560	F. W.	F.	20	Apr.	10	Apr.	5	Apr.	8	—	Coherent	„	—	Inf.	—	—	—	633
1119	2561	E. D.	F.	15	„	10	„	3	„	5	—	Discrete	„	—	Inf.	4 large	—	—	634
1120	2562	A. G.	F.	38	„	10	Mar.	31	„	3	—	Mild	„	—	Inf.	2 large	—	—	635
1121	2564	E. S.	F.	10	„	10	—		—		—	Mild	„	—	Inf.	4 foveate	—	—	143
1122	2565	E. B.	F.	2	„	10	—		—		—	Coherent	„	—	Unvaccinated		—	—	636
1123	2566	M. B.	F.	3	„	10	Apr.	2	Apr.	5	—	Coherent	„	—	Unvaccinated		—	—	324
1124	2567	E. B.	F.	38	„	11	„	3	„	9	—	Mild	„	—	Inf.	—	—	—	637
1125	2568	M. H.	F.	33	„	11	—		—		—	Confluent	„	—	Inf. (alleged).	—	—	No vaccination cicatrices	638
1126	2569	A. M.	F	15	„	11	Apr.	9	Apr.	11	Apr. 12	Discrete	„	—	Inf.	2 foveate	—	—	192
1127	2570	A. W.	M.	14	„	11	—		—		—	Confluent	„	—	Inf.	3 faint	—	—	276
1128	2571	S. J.	F.	12	„	11	Apr.	6	Apr.	8	—	Confluent	„	—	Inf.	4 faint	—	—	87
1129	2572	J. L.	M.	28	„	11	„	8	„	10	Apr. 13	Malignant	D.	Apr. 16	Inf.	Not discernible.	—	—	639
1130	2573	H. H.	F.	3	„	11	—		—		—	Confluent	D.	Apr. 17	Unvaccinated		—	—	250
1131	2574	H. G.	F.	55	„	11	—		—		—	Mild	Rec.	—	Inf.	—	—	—	640
1132	2575	T. G.	M.	64	„	11	—		—		—	Mild	„	—	Inf.	—	—	—	640
1133	2577	S. T.	M.	24	„	11	Apr.	3	Apr.	5	—	Mild	„	—	Inf.	—	—	—	641
1134	2578	L. P.	M.	39	„	11	„	7	„	9	—	Mild	„	—	Inf.	—	8 years ago	—	641
1135	2579	A. K.	F.	23	„	11	„	7	„	8	—	Confluent	„	—	Unvaccinated		—	Hæmorrhage into pocks. Born at Cheltenham. Attempt at vaccination 7th April; no result.	642
1136	2580	S. R.	F.	24	„	11	„	8	„	10	Apr. 13	Mild	„	—	Inf.	4 faint	—	—	643
1137	2582	E. L.	F.	53	„	11	„	8	„	10	—	Malignant	D.	Apr. 11	Inf.	—	—	—	644
1138	2583	A. T.	F.	18	„	11	„	9	„	11	Apr. 13	Malignant	D.	„ 14	Inf.	3 plain	—	Contracted at service in Lower Barton Street.	417
1139	2585	M. A. M.	F.	38	„	11	„	7	„	10	—	Discrete	Rec.	—	Inf.	—	—	—	645

No.	Name and Notification Number.	Sex.	Age.	Date of Notification.	Date of Onset.	Date of Rash.	Date of Removal to Hospital.	Type of Attack.	Result.	Date of Death.	Vaccination. Date.	Vaccination. No. of Marks.	Re-vaccination Date.	Remarks.	No. in House Register.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
				1896.											
1140	2586 N. M.	F.	11	Apr. 11	Apr. 6	Apr. 8	Apr. 16	Mild	Rec.	—	Inf.	3 plain	—	——	646
1141	2587 M. W.	F.	66	,, 11	—	—	—	Mild	,,	—	Inf.	—	33 years ago	——	647
1142	2588 F. K.	F.	2	,, 11	Apr. 6	Apr. 8	Apr. 13	Confluent	,,	—	Unvaccinated		—	——	125
1143	2589 E. H.	F.	9	,, 11	,, 8	,, 9	—	Mild	,,	—	Inf.	—	—	——	434
1144	2590 W. H.	M.	7	,, 11	,, 8	,, 9	—	Confluent	,,	—	Inf.	4 large foveate.	—	Face "pitted"	434
1145	2591 H. P.	F.	46	,, 11	—	—	—	Mild	,,	—	Inf.	—	—	——	410
1146	2593 G. S.	M.	41	,, 11	Apr. 7	Apr. 9	Apr. 15	Confluent	,,	—	Inf.	1 plain	—	——	429
1147	2594 Mrs. H.	F.	65	,, 11	—	—	—	Mild	,,	—	Inf.	—	—	——	648
1148	2595 A. C.	M.	26	,, 12	Apr. 10	Apr. 12	—	Mild	,,	—	Inf.	—	—	——	437
1149	2597 Mrs. W.	F.	48	,, 12	—	—	—	Coherent	,,	—	Unvaccinated		—	——	650
1150	2598 J. L.	F.	13	,, 12	Apr. 7	Apr. 9	—	Confluent	,,	—	Inf.	2 small	—	Hæmorrhage into pocks	651
1151	2599 M. B.	F.	30	,, 12	,, 10	,, 12	Apr. 12	Malignant	D.	Apr. 15	Inf.	Not discernible.	—	Said to have had "small-pox years ago."	420
1152	2600 F. C.	F.	21	,, 12	,, 8	,, 11	—	Discrete	Rec.	—	Inf.	—	—	——	652
1153	2602 E. C.	F.	29	,, 12	,, 4	,, 7	Apr. 17	Confluent	,,	—	Inf.	5 foveate	—	Desiccating	653
1154	2603 E. J.	F.	27	,, 12	—	—	—	Confluent	D.	Apr. 16	?	—	—	——	654
1155	2604 W. H.	M.	32	,, 12	—	—	—	Coherent	Rec.	—	Inf.	—	—	——	655
1156	2605 A. T.	F.	14	,, 12	Apr. 10	Apr. 12	Apr. 13	Malignant	D.	Apr. 14	Unvaccinated		—	Attempt at vaccination, April 6	656
1157	2606 W. M.	M.	24	,, 12	,, 8	,, 10	—	Discrete	Rec.	—	Inf.	—	—	——	657
1158	2607 W. J. E.	M.	36	,, 12	,, 9	,, 11	Apr. 17	Confluent	,,	—	Inf.	Not discernible.	—	Hæmorrhage into pocks	658
1159	2608 S. B.	F.	4	,, 12	—	—	,, 13	Confluent	,,	—	A few days	2 vesicles	—	Rapid subsidence of rash	420
1160	2609 R. B.	M.	57	,, 13	Apr. 11	Apr. 13	—	Coherent	,,	—	Inf.	—	—	——	659
1161	2610 F. N.	F.	6	,, 13	,, 11	,, 13	Apr. 14	Confluent	,,	—	Unvaccinated		—	——	140
1162	2611 M. S.	F.	4	,, 13	,, 10	,, 12	—	Confluent	,,	—	Unvaccinated		—	——	660
1163	2612 W. S.	M.	28	,, 13	,, 8	,, 10	—	Confluent	D.	Apr. 16	Inf.	4 plain	Apr. 1. No result.	——	661
1164	2613 A. G.	F.	18	,, 13	,, 8	,, 11	—	Coherent	Rec.	—	Inf.	4	—	——	662
1165	2614 A. H.	M.	31	,, 13	,, 8	,, 10	—	Mild	,,	—	Inf.	—	Apr. 2	——	663
1166	2615 Mrs. B.	F.	72	,, 13	,, 8	,, 10	—	Mild	,,	—	Inf.	—	Twice	——	664
1167	2616 E. C.	M.	33	,, 13	,, 10	,, 12	—	Coherent	,,	—	Inf.	—	—	——	665
1168	2617 G. P.	M.	24	,, 13	,, 9	,, 12	—	Coherent	,,	—	Inf.	—	—	——	666
1169	2618 R. R.	M.	3/12	,, 13	—	—	—	Confluent	D.	Apr. 18	Unvaccinated		—	——	181
1170	2620 A. P.	F.	43	,, 14	Apr. 12	Apr. 14	Apr. 14	Confluent	D.	,, 26	Inf. (alleged)	No marks	—	——	667
1171	2621 E. M.	F.	5	,, 14	,, 6	,, 8	—	Confluent	Rec.	—	Unvaccinated		—	——	560
1172	2622 K. G.	F.	14	,, 14	,, 6	,, 10	—	Confluent	,,	—	Inf.	4 smooth	—	Rash "aborted" without maturating.	668
1173	2623 C. G.	M.	9	,, 14	,, 11	,, 13	—	Coherent	,,	—	Mar. 29	—	—	Rash copious, but aborting	400
1174	2624 E. G.	F.	13	,, 14	,, 11	,, 13	—	Confluent	,,	—	Inf.	—	—	——	400
1175	2625 B. L.	F.	2	,, 14	—	—	—	Confluent	,,	—	Unvaccinated		—	——	464
1176	— L. L.	F.	1	—	Apr. 12	Apr. 14	—	Confluent	,,	—	Apr. 12*	—	—	*Day of onset	464
1177	2626 A. P.	M.	18	Apr. 14	,, 10	,, 12	Apr. 14	Confluent	,,	—	Inf.	2 plain	—	——	670

1178	2627	Mrs. P.	F.	43	„	14	—	—	—	Discrete	„	—	Inf.	—	—			425
1179	2629	T. C.	M.	9	„	14	—	—	—	Confluent	D.	Apr. 20	Unvaccinated		—			671
1180	2631	C. G.	M.	9	„	14	Apr. 11	Apr. 13	Apr. 13	Confluent	Rec.	—	Unvaccinated		—			672
1181	2632	L. P.	F.	10	„	14	—	—	—	Mild	„	—	Unvaccinated		—			673
1182	2633	E. K.	F.	2	„	14	—	—	—	Confluent	„	—	Unvaccinated		—			674
1183	2634	J. J.	M.	20	„	14	Apr. 9	Apr. 11	—	Confluent	„	—	Apr. 8	—	—			675
1184	2635	W. A.	M.	1	„	14	—	—	—	Discrete	„	—	Unvaccinated		—			409
1185	2636	F. A.	F.	8	„	14	—	—	—	Discrete	„	—	Inf.	—	—			409
1186	2637	G. D.	M.	28	„	14	Apr. 10	Apr. 12	Apr. 16	Discrete	„	—	Inf.	4 plain	—			676
1187	2638	J. C.	M.	6	„	14	„ 7	„ 9	„ 15	Confluent	„	—	Unvaccinated		—			677
1188	2639	W. L.	M.	3	„	14	„ 8	„ 10	„ 15	Confluent	D.	Apr. 19	Unvaccinated		—			678
1189	2640	C. V.	M.	7	„	14	„ 9	„ 11	—	Confluent	Rec.	—	Unvaccinated		—			251
1190	2641	J. V.	M.	5/12	„	14	„ 9	„ 11	—	Discrete	„	—	Unvaccinated		—			251
1191	2643	H. H.	F.	5	„	14	„ 10	„ 12	—	Confluent	„	—	Apr. 9	—	—			679
1192	2644	M. M.	F.	35	„	14	„ 11	„ 14	Apr. 16	Mild	„	—	Inf.	2 faint	—			646
1193	2645	E. B.	F.	2	„	14	„ 11	„ 13	„ 15	Coherent	„	—	Unvaccinated					313
1194	2646	E. P.	F.	13	„	14	„ 12	„ 14	„ 15	Confluent	„	—	Inf.	4 foveate	—			427
1195	2647	C. P.	M.	4	„	14	„ 13	„ 14	—	Mild	„	—	Apr. 3	—	—			220
1196	2648	L. B.		2	„	14	Mar. 19	Mar. 21	—	Mild	„	—	Mar. 16	—	—			680
1197	2649	A. C.		33	„	14	Apr. 11	Apr. 13	—	Confluent	„	—	Inf.	5	—	Hæmorrhage into pocks		681
1198	2650	A. M.	M.	5	„	14	„ 8	„ 10	—	Confluent	D.	Apr. 21	Unvaccinated		—			591
1199	2651	H. G.	M.	15	„	14	„ 9	„ 11	Apr. 15	Discrete	Rec.	—	Inf.	2 plain, 1 faint.	—			682
1200	2652	W. G.	M.	35	„	14	Mar. 27	Mar. 31	—	Mild	„	—	Inf.	—	—			683
1201	2653	M. P.	F.	13	„	14	—	—	—	Mild	„	—	Inf.	4 foveate	—			684
1202	2654	F. S.	M.	12	„	14	Apr. 12	Apr. 14	—	Mild	„	—	Inf.	—	—			685
1203	2655	J. M.	M.	16	„	14	„ 6	„ 8	Apr. 17	Mild	„	—	Inf.	4 large	—			686
1204	2656	C. H.	F.	31	„	14	„ 10	„ 12	„ 14	Confluent	D.	Apr. 22	Inf.	3 plain	—	Hæmorrhage into pocks		687
1205	2657	E. D.	F.	39	„	14	„ 11	„ 14	—	Confluent	D.	„ 16	Inf.	—	Apr. 11	Abortion; seven months		688
1206	2658	J. M.	M.	46	„	14	„ 9	„ 11	Apr. 15	Discrete	Rec.	—	Aged 7	2 plain	—			689
1207	2659	H. S.	F.	26	„	14	„ 12	„ 14	—	Coherent	„	—	Inf.	2	—			690
1208	2660	R. L. J.	F.	25	„	14	—	—	—	Discrete	„	—	Inf.	—	—			691
1209	2661	A. H.	F.	14	„	14	Apr. 14	Apr. 16	Apr. 18	Discrete	„	—	Inf.	2 foveate	—			692
1210	2662	C. H.	M.	4	„	14	„ 13	„ 15	„ 18	Confluent	„	—	Unvaccinated		—	Hæmorrhage into pocks		692
1211	2663	E. A.	F.	22	„	14	—	—	—	Mild	„	—	Inf.	—	—			693
1212	2664	T. P.	F.	42	„	14	Apr. 12	Apr. 14	Apr. 15	Confluent	„	—	Inf.	4 good	—	Hæmorrhage into pocks; erythema on 11th day.		694
1213	2665	R. H.	F.	20	„	14	„ 10	„ 14	—	Confluent	„	—	Inf.	—	—			695
1214	2666	W. T.	M.	29	„	14	„ 12	„ 14	—	Mild	„	—	Inf.	—	—			102
1215	2667	D. M.	M.	44	„	14	—	—	—	Confluent	„	—	Inf.	—	Aged 14			696
1216	2669	J. H.	F.	35	„	14	Apr. 8	Apr. 11	—	Discrete	„	—	Inf.	—	—	"Small-pox" in infancy		697
1217	2670	E. J. H.	F.	23	„	14	„ 12	„ 14	Apr. 15	Discrete	„	—	Inf.	1 plain, 1 faint.	—			698
1218	2671	H. M.	M.	25	„	14	„ 3	„ 5	„ 15	Confluent	„	—	Inf.	4 plain	—			699
1219	2672	W. J.	F.	26	„	14	„ 12	„ 14	„ 15	Malignant	D.	Apr. 17	Unvaccinated		—	Attempted vaccination, Apr. 8		700
1220	2673	R. P.	F.	61	„	15	—	—	—	Mild	Rec	—	Inf.	—	—			701
1221	2674	W. W.	M.	50	„	15	—	—	—	Confluent	D.	Apr. 16	Inf.	—	—			702
1222	2677	L. R.	F.	2	„	15	Apr. 13	Apr. 15	—	Confluent	Rec.	—	Unvaccinated		—			632
1223	2678	E. P.	F.	8	„	15	„ 12	„ 14	—	Confluent	D.	Apr. 25	Unvaccinated		—			527
1224	2679	W. H.	F.	5/12	„	15	—	—	—	Confluent	D.	„ 20	Unvaccinated		—			633
1225	2680	S. C.	F.	52	„	15	—	—	—	Discrete	Rec.	—	Inf.	—	—			703
1226	2681	R. M.	F.	15	„	15	Apr. 11	Apr. 13	—	Malignant	D.	Apr.	Inf.	4	—	Mother's statement		444
1227	2682	E. M.	F.	12	„	15	„ 13	„ 15	—	Mild	Rec.	—	Inf.	—	Attempt failed			444
1228	2683	J. A.	M.	36	„	15	„ 12	„ 14	Apr. 17	Coherent	„	—	Inf.	4 plain	—			704

No.	Name and Notification Number.	Sex.	Age.	Date of Notification.	Date of Onset.	Date of Rash.	Date of Removal to Hospital.	Type of Attack.	Result.	Date of Death.	Vaccination. Date.	Vaccination. No. of Marks.	Re-vaccination Date.	Remarks.	No. in House Register.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
				1896.											
1229	2685 E. S.	F.	40	Apr. 15	Apr. 8	Apr. 10	—	Coherent	Rec.	—	Inf.	—	—	———	940
1230	2686 J. B.	M.	23	„ 15	„ 12	„ 14	—	Mild	„	—	Inf.	—	—	———	705
1231	2687 L. T.	F.	36	„ 15	„ 11	„ 13	Apr. 15	Confluent	D.	Apr. 20	Inf.	4 plain	—	Mother of No. 1556	706
1232	2688 A. S.	M.	6	„ 15	„ 13	„ 15	—	Confluent	D.	„ 28	Unvaccinated		—	Vaccinated Apr. 8, without result	940
1233	2689 W. S.	M.	37	„ 15	„ 11	„ 13	—	Coherent	Rec.	—	Inf.	—	—	———	295
1234	2690 E. C.	F.	30	„ 15	„ 13	„ 15	Apr. 17	Discrete	„	—	Inf.	3 plain	—	Large pustules	707
1235	2691 T. P.	M.	15	„ 15	„ 13	„ 15	„ 18	Confluent	„	—	Inf.	4 plain, scarred.	—	Hæmorrhage into vesicles	425
1236	2692 F. B.	F.	36	„ 15	—	—	—	Mild	„	—	Inf.	—	20 years ago	———	708
1237	2693 T. S.	M.	9	„ 15	—	—	—	Discrete	„	—	Unvaccinated		—	Attempted vaccination on Apr. 18; failed.	709
1238	2694 A. W.	M.	25	„ 15	—	—	—	Confluent	„	—	Inf.	—	—	———	710
1239	2695 E. P.	F.	26	„ 15	—	—	—	Discrete	„	—	Inf.	—	—	———	711
1240	2696 D. D.	F.	3	„ 15	Apr. 12	Apr. 14	—	Discrete	„	—	Unvaccinated		—	———	426
1241	2697 E. C.	F.	16	„ 15	„ 12	„ 14	Apr. 16	Confluent	„	—	Inf.	3 good	Apr. 8 (1 slight).	———	712
1242	2698 R. W.	F.	33	„ 15	„ 6	„ 8	—	Confluent	D.	Apr. 25	Inf.	—	—	———	713
1243	2699 J. G. E.	M.	43	„ 15	„ 11	„ 12	—	Mild	Rec.	—	Inf.	—	20 years ago	———	714
1244	2700 E. F.	M.	4	„ 15	„ 12	„ 14	Apr. 16	Confluent	„	—	Unvaccinated		—	———	715
1245	2701 M. B.	F.	27	„ 15	—	—	—	Mild	„	—	Inf.	6 good	—	———	716
1246	2702 E. V.	F.	15	„ 15	Apr. 11	Apr. 13	—	Confluent	„	—	Inf.	—	—	———	251
1247	2703 A. R.	M.	1	„ 15	„ 14	„ 16	Apr. 18	Confluent	D.	Apr. 22	Unvaccinated		—	———	125
1248	2704 R. J. B.	M.	37	„ 15	„ 4	„ 6	—	Confluent	Rec.	—	Inf.	3 faint	—	———	717
1249	2706 E. H.	F.	36	„ 15	—	—	—	Mild	„	—	Inf.	—	—	———	371
1250	2707 W. F.	M.	7	„ 15	Apr. 13	Apr. 15	Apr. 17	Confluent	D.	Apr. 23	Unvaccinated		—	———	715
1251	2708 M. A.	F.	18	„ 15	„ 13	„ 15	„ 19	Mild	Rec.	—	Inf.	4 plain	—	———	294
1252	2709 C. S.	M.	3	„ 15	„ 13	„ 15	„ 17	Confluent	„	—	Unvaccinated		—	———	429
1253	2710 C. W.	M.	49	„ 15	—	—	—	Mild	„	—	Inf.	—	—	———	276
1254	2711 J. R.	M.	26	„ 16	Apr. 13	Apr. 15	Apr. 15	Confluent	D.	Apr. 23	Apr. 14	—	—	Hæmorrhage into pustules. Vaccinated in infancy, but it "did not take."	608
1255	2712 H. D.	M.	5	„ 16	„ 15	„ 17	„ 18	Confluent	D.	„ 28	Unvaccinated		—	———	718
1256	2713 G. M.	M.	21	„ 16	„ 14	„ 16	„ 17	Mild	Rec.	—	Inf.	4 plain	—	———	719
1257	2714 F. O.	M.	19	„ 16	—	—	—	Coherent	„	—	Inf.	—	—	———	720
1258	2715 R. D.	F.	26	„ 16	—	—	—	Mild	„	—	Inf.	—	—	Parturition, Apr. 10	721
1259	2716 E. L.	F.	18	„ 16	—	—	—	Discrete	„	—	Inf.	—	—	———	722
1260	2717 E. T.	F.	2	„ 16	Apr. 14	Apr. 15	—	Confluent	„	—	Unvaccinated		—	———	443
1261	2864 T. C. T.	M.	1	„ 21	„ 19	„ 20	—	Confluent	D.	Apr. 28	Unvaccinated		—	———	443
1262	2718 W. S.	M.	8	„ 16	—	—	—	Confluent	Rec.	—	Unvaccinated		—	———	723
1263	2719 W. C.	M.	46	„ 16	Apr. 15	Apr. 16	—	Coherent	„	—	Inf.	—	—	———	652
1264	2720 N. L.	F.	32	„ 16	—	—	—	Mild	„	—	Inf.	—	—	———	724
1265	2721 E. G.	F.	35	„ 16	Apr. 13	Apr. 15	—	Discrete	„	—	Inf.	—	—	———	725
1266	2724 Mrs. P.	F.	73	„ 16	—	—	—	Mild	„	—	Inf.	—	"Often"	———	410
1267	2725 E. R. G.	F.	28	„ 16	Apr. 14	Apr. 14	—	Mild	„	—	Inf.	—	—	———	726

1268	2126	F. B.	M.	25	„	16	„	12	„	14	Apr.	17	Confluent	D.	Apr.	24	Inf.	4 plain	—	Hæmorrhage into pustules. Broncho pneumonia.	727
1269	2727	L. A.	F.	2	„	16	„	13	„	15	„	18	Confluent	D.	„	19	Unvaccinated		—	Hæmorrhage into pocks	407
1270	2728	O. A.	M.	5	„	16	—		—			—	Discrete	Rec.	—		Unvaccinated		—	—	409
1271	2729	E. B.	F.	30	„	16	Apr.	11	Apr.	13		—	Mild	„	—		Inf.	—	—	—	466
1272	2730	E. P.	F.	29	„	16	„	12	„	15		—	Discrete	„	—		Inf.	—	—	—	728
1273	2732	E. S.	F.	56	„	16	—		—			—	Discrete	„	—		Inf.	—	Apr. 5	—	479
1274	2733	A. S.	F.	43	„	16	—		—			—	Coherent	„	—		Inf.	—	—	—	729
1275	2734	W. F.	M.	40	„	17	Apr.	15	Apr.	17	Apr.	18	Confluent	D.	Apr.	19	Inf.	4 plain	Apr. 13	Hæmorrhage into pocks	730
1276	2735	H. H.	M.	2	„	17	„	15	„	17	„	18	Confluent	D.	„	22	Unvaccinated		—	—	731
1277	2736	S. M.	F.	30	„	17	„	14	„	16	„	18	Coherent	Rec.	—		Inf.	3 plain	—	—	732
1278	2737	J. S.	M.	28	„	17	—		—			—	Discrete	„	—		Inf.	3 plain	—	—	733
1279	2737	H. W.	M.	24	„	17	Apr.	14	Apr.	16		—	Confluent	„	—		Inf.	4 good	—	—	734
1280	2739	M. A. S.	F.	7	„	17	„	14	„	16	Apr.	18	Coherent	„	—		Unvaccinated		—	—	735
1281	2740	E. B.	F.	23	„	17	—		—			—	Discrete	„	—		Inf.	—	—	—	736
1282	2741	J. V.	F.	29	„	17	Apr.	5	Apr.	7		—	Mild	„	—		Inf.	—	—	—	737
1883	2742	A. S.	F.	30	„	17	„	14	„	16	Apr.	18	Discrete	„	—		Inf.	3 plain	—	—	725
1284	2743	W. R. E.	M.	20	„	17	„	14	„	16	„	18	Confluent	„	—		Inf.	4 good	—	—	738
1285	2746	E. H.	F.	25	„	17	„	9	„	11		—	Coherent	„	—		Inf.	—	—	—	400
1286	2747	F. W.	M.	3	„	17	„	14	„	17		—	Confluent	D.	Apr.	23	Unvaccinated		—	—	739
1287	2748	M. H.	F.	5	„	17	„	14	„	16		—	Confluent	D.	„	22	Unvaccinated		—	—	434
1288	2749	K. H.	F.	3	„	17	„	14	„	16		—	Malignant	D.	„	18	Unvaccinated		—	—	434
1289	2750	H. W. L.	M.	13	„	17	—		—			—	Mild	Rec.	—		Inf.	—	—	—	464
1290	—	E. L.	F.	10	—		Apr.	12	Apr.	14		—	Confluent	„	—		Apr. 12*	—	—	*Day of onset of small pox	464
1291	2751	A. A.	F.	4	Apr.	17	„	15	„	17		—	Confluent	D.	Apr.	24	Unvaccinated		—	—	518
1292	2752	E. P.	F.	23	„	17	„	8	„	11		—	Confluent	Rec.	—		Unvaccinated		—	—	548
1293	2753	E. H.	F.	16	„	17	„	14	„	16	Apr.	18	Discrete	„	—		Inf.	3 plain	—	—	740
1294	2754	P. P.	M.	14	„	17	„	11	„	13	„	18	Mild	„	—		Inf.	4 plain	—	—	427
1295	2755	E. R.	F.	35	„	17	„	5	„	7		—	Mild	„	—		Inf.	2 scars	—	—	741
1296	2756	E. P.	M.	23	„	17	—		—			—	Mild	„	—		Inf.	—	—	—	742
1297	2757	S. M.	F.	28	„	17	Apr.	15	Apr.	17	Apr.	18	Mild	„	—		Inf. (alleged).	No marks	—	—	719
1298	—	M. M.	F.	1 day	—		—		—		„	20	Indeterminate	D.	Apr.	21	Unvaccinated		—	Born in hospital with hæmorrhagic rash.	719
1299	2758	L. E. S.	M.	15	Apr.	17	Apr.	13	Apr.	15	„	18	Coherent	Rec.	—		Inf.	4 small, plain.	Apr. 9 (1 mark).	—	743
1300	2759	R. L.	M.	9/12	„	17	—		—			—	Confluent	D.	Apr.	28	Unvaccinated		—	—	744
1301	2761	C. D.	F.	15	„	17	Apr.	15	Apr.	17		—	Mild	Rec.	—		Inf.	—	Apr. 4 (3)	—	538
1302	2762	M. A. S.	F.	32	„	17	—		—			—	Confluent	„	—		Inf.	—	—	Confined day before onset	745
1303	2763	A. H.	F.	36	„	18	Apr.	12	Apr.	14	Apr.	18	Discrete	„	—		Inf.	No marks	—	—	746
1304	2764	P. Y.	M.	2	„	18	„	9	„	11	„	20	Confluent	D.	Apr.	20	Unvaccinated		—	—	747
1305	2765	M. M.	F.	60	„	18	„	16	„	18	„	19	Mild	Rec.	—		Inf.	?	20 years ago and on Apr. 9 (4).	—	536
1306	2766	A. P.	F.	15	„	18	„	15	„	17	„	19	Mild	„	—		Inf.	4 plain	—	—	667
1307	2767	F. E. S.	F.	22	„	18	„	14	„	16		—	Mild	„	—		Inf.	—	Apr. 13	—	748
1308	2768	M. E. B.	F.	32	„	18	„	17	„	18		—	Malignant	D.	Apr.	23	Inf.	—	—	—	749
1309	2769	W. S.	M.	4	„	18	„	14	„	16	Apr.	18	Mild	„	—		Unvaccinated		—	—	735
1310	2770	T. H. P.	M.	32	„	18	„	17	„	18		—	Mild	„	—		Inf.	—	Apr. 5	—	547
1311	2771	S. A.	M.	14	„	18	„	14	„	18		—	Discrete	„	—		Inf.	2 foveate	—	—	750
1312	2772	E. S.	F.	22	„	18	„	15	„	17	Apr.	20	Discrete	„	—		Inf.	4 foveate	—	Rash rapidly fading	480
1313	2673	W. G.	M.	17	„	18	„	13	„	15	„	18	Discrete	„	—		Inf.	4 faint	Apr. 10 (1)	—	751
1314	2774	V. S.	F.	6	„	18	„	11	„	13		—	Coherent	„	—		Apr. 11	—	—	—	752
1315	2775	J. A.	M.	40	„	18	Mar.	23	Mar.	25		—	Mild	„	—		Inf.	—	2 or 3 times without result.	—	407

No.	Name and Notification Number.	Sex.	Age.	Date of Notification.	Date of Onset.	Date of Rash.	Date of Removal to Hospital.	Type of Attack.	Result.	Date of Death.	Vaccination Date.	Vaccination No. of Marks.	Re-vaccination Date.	Remarks.	No. in House Register.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
1316	2776 F. M.	M.	16	Apr. 18	—	—	—	Mild	Rec.	—	Inf.	—	—	——	753
1317	2778 J. C.	M.	17	„ 18	—	—	—	Mild	„	—	Inf.	—	—	——	754
1318	2780 A. B.	M.	11	„ 18	Apr. 15	Apr. 17	Apr. 19	Discrete	„	—	Inf.	4 good	—	——	755
1319	2781 C. W.	M.	18	„ 18	„ 16	„ 17	—	Mild	„	—	Inf.	—	—	——	756
1320	2782 G. P.	F.	28	„ 18	„ 16	„ 18	—	Mild	„	—	Inf.	—	5 and 7 weeks before. No result.	——	404
1321	2783 J. C.	M.	26	„ 18	„ 15	„ 17	Apr. 19	Coherent	„	—	Inf.	2 plain	April 17. No result.	——	757
1322	2734 B. O.	M.	51	„ 18	—	—	—	Discrete	„	—	Unvaccinated		—	——	496
1323	2789 T. W.	M.	18	„ 19	Apr. 17	Apr. 19	—	Discrete	„	—	Inf.	—	—	——	758
1324	2790 A. J	M.	3	„ 19	„ 15	„ 17	—	Discrete	„	—	Apr. 11	2 vesicle	—	——	759
1325	2791 A. D.	F.	3	„ 19	„ 12	„ 14	Apr. 20	Discrete	„	—	„ 12	—	—	Rash peculiar, minute red papules and pustules.	451
1326	2792 J. W.	M.	35	„ 19	—	—	—	Mild	„	—	Inf.	—	—	——	405
1327	2793 T. E. B.	M.	2	„ 19	—	—	—	Coherent	„	—	Unvaccinated		—	——	760
1328	2794 F. R.	F.	1	„ 19	Apr. 15	Apr. 17	Apr. 19	Confluent	D.	Apr. 22	Unvaccinated		—	——	537
1329	2795 E. V.	F.	2	„ 19	„ 17	„ 19	—	Confluent	D.	„ 22	Unvaccinated		—	——	251
1330	2796 L. P.	F.	6 wks.	„ 19	„ 13	„ 15	—	Mild	Rec.	—	Apr. 6	—	—	——	557
1331	2797 A. (Inf.)	F.	10days	„ 19	—	—	—	Confluent	D.	Apr. 20	Unvaccinated		—	——	409
1332	2798 R. P.	M.	21	„ 19	Apr. 16	Apr. 18	Apr. 22	Confluent	Rec.	—	Inf.	4 plain	—	Hæmorrhage into pustules	425
1333	2799 W. C.	M.	6	„ 19	Mar. 28	„ 2	—	Mild	„	—	Unvaccinated		—	——	761
1334	2800 E. C.	F.	4	„ 19	Apr. 15	„ 17	—	Discrete	„	—	Unvaccinated		—	——	761
1335	2801 E. C.	F.	12	„ 19	„ 15	„ 17	—	Discrete	„	—	Inf.	3 foveate	—	——	761
1336	2802 J. E. H.	M.	19	„ 19	„ 15	„ 17	—	Confluent	„	—	Inf.	—	—	Multiple abscesses	762
1337	2803 W. S.	M.	1	„ 19	„ 16	„ 18	Apr. 20	Confluent	D.	Apr. 23	Apr. 14	—	—	——	763
1338	2804 A. W.	F.	20	„ 19	„ 14	„ 16	„ 19	Confluent	Rec.	—	„ 11	4 large	—	Did not "take" in infancy	764
1339	2805 C. W.	M.	45	„ 19	—	—	—	Confluent	„	—	Inf.	—	—	Engaged on hospital works	765
1340	2806 W. H.	M.	60	„ 19	Apr. 17	Apr. 19	Apr. 20	Malignant	D.	Apr. 22	Inf.	—	—	——	766
1341	2807 F. W.	M.	34	„ 19	„ 9	„ 12	—	Mild	Rec.	—	Inf.	—	—	——	767
1342	2808 J. M.	M.	60	„ 19	—	—	—	Confluent	D.	Apr. 23	Inf.	—	—	——	862
1343	2809 F. M.	M.	17	„ 19	Apr. 16	Apr. 18	Apr. 22	Confluent	Rec.	—	Inf.	4 plain	—	Hæmorrhage into pustules	768
1344	2810 G. M.	M.	19	„ 19	„ 16	„ 18	„ 22	Mild	„	—	Inf.	4 foveate	—	——	768
1345	2811 W. S.	M.	18	„ 19	—	—	—	Discrete	„	—	Inf.	3 foveate	—	——	769
1346	2812 F. J.	F.	41	„ 19	Apr. 16	Apr. 18	Apr. 20	Confluent	„	—	Inf.	3 foveate, 1 faint.	—	Hæmorrhage into pustules, "scarlatinal" rash on 11th day.	770
1347	2813 E. B.	F.	8	„ 19	—	—	—	Mild	„	—	Inf.	—	—	——	771
1348	2814 L. T.	F.	3	„ 19	Apr. 17	Apr. 19	—	Confluent	„	—	Unvaccinated		—	——	772
1349	2815 F. G.	M.	30	„ 19	—	—	—	Mild	„	—	Inf.	—	—	——	773
1350	2816 F. C. R.	M.	10	„ 19	Apr. 14	Apr. 16	—	Confluent	„	—	Unvaccinated		—	——	774
1351	2817 T. H. S.	M.	14	„ 19	„ 15	„ 17	—	Mild	„	—	Inf.	4 foveate	8 days before onset (2).	A first attempt at re-vaccination failed.	775
1352	2818 F. V.	F.	10	„ 19	„ 16	„ 18	Apr. 20	Mild	„	—	Inf.	2 faint	—	——	776
1353	2819 P. J.	M.	28	„ 19	„ 14	„ 16	—	Mild	„	—	Inf.	—	Apr. 7	——	777

1354	2820	E. H.	F.	4	„	20	„ 15	„ 17	Apr. 18	Confluent	D.	Apr. 23	Unvaccinated	—	Hæmorrhage into pocks	778
1355	2821	E. B.	F.	36	„	20	„ 18	„ 20	—	Coherent	Rec.	—	Inf.	—	———	779
1356	2822	A. J.	M.	4	„	20	„ 17	„ 19	—	Discrete	„	—	Unvaccinated	—	Not pustular	780
1357	2823	M. O.	F.	36	„	20	„ 17	„ 19	Apr. 20	Malignant	D.	Apr. 21	Inf. Not discernible.	—	———	530
1358	2824	W. S.	M.	18	„	20	„ 18	„ 20	—	Coherent	Rec.	—	Inf.	—	———	450
1359	2825	A. D.	F.	1/12	„	20	—	—	—	Confluent	D.	Apr. 26	Unvaccinated	—	———	781
1360	2826	W. B.	M.	27	„	20	Apr. 18	Apr. 20	—	Mild	Rec.	—	Inf.	—	———	944
1361	2827	E. R.	F.	27	„	20	—	—	—	Mild	„	—	Inf.	—	———	783
1362	2828	E. R.	F.	28	„	20	Apr. 17	Apr. 19	May 5	Confluent	„	—	Unvaccinated	—	Born at Bourton-on-Water. Hæmorrhage into pocks.	784
1363	2829	F. P.	M.	20	„	20	—	—	—	Mild	„	—	Inf.	—	———	785
1364	2830	M. L.	F.	30	„	20	Apr. 16	Apr. 18	Apr. 23	Confluent	„	—	Inf. 4 plain	Apr. 15 (1)	———	415
1365	2831	J. B.	F.	3	„	20	—	—	—	Confluent	D.	Apr. 23	Unvaccinated	—	———	760
1366	2832	E. S.	M.	3	„	20	Apr. 16	Apr. 18	—	Confluent	Rec.	—	Unvaccinated	—	———	786
1367	2833	E. P.	F.	1/12	„	20	„ 17	„ 19	—	Mild	„	—	9 days before.	—	———	338
1368	2834	F. P.	F.	24	„	20	„ 17	„ 19	—	Mild	„	—	Inf.	—	———	338
1369	2835	E. P.	M.	18	„	20	„ 15	„ 17	—	Mild	„	—	Inf.	—	Attempt at re-vaccination failed	342
1370	2836	C. O.	F.	32	„	20	„ 18	„ 20	Apr. 23	Coherent	„	—	Inf. 3 plain	—	———	787
1371	2837	F. P.	M.	30	„	20	„ 16	„ 18	„ 22	Mild	„	—	Inf.	Apr. 11	———	557
1372	2838	S. T.	F.	6	„	20	„ 16	„ 18	—	Confluent	D.	Apr. 21	Unvaccinated	—	———	417
1373	2839	F. D.	F.	29	„	20	„ 16	„ 18	Apr. 20	Mild	Rec.	—	Inf. 2 faint	—	———	788
1374	3339	N. M.	F.	8	May	30	May 11	May 13	—	Coherent	„	—	Unvaccinated	—	———	1005
1375	2841	H. J.	M.	2	Apr.	20	Apr. 16	Apr. 18	May 6	Confluent	„	—	Apr. 9	—	———	790
1376	2842	E. S.	F.	30	„	20	„ 18	„ 20	—	Mild	„	—	Inf.	—	Attempt at re-vaccination on April 15, no result.	441
1377	2843	F. H.	F.	22	„	20	„ 9	„ 13	—	Discrete	„	—	Inf.	—	———	614
1378	2845	H. F.	M.	25	„	20	„ 17	„ 19	Apr. 23	Confluent	„	—	Inf. 2 plain	—	———	791
1379	2846	J. C.	M.	14	„	20	„ 20	„ 20	—	Mild	„	—	Inf.	Apr. 15	———	712
1380	2847	A. G.	M.	29	„	20	—	—	—	Mild	„	—	Inf.	—	Attempted re-vaccination one month previously, failed.	792
1381	2848	E. H.	F.	30	„	20	—	—	—	Coherent	„	—	Inf.	—	———	793
1382	2849	R. R.	F.	45	„	20	—	—	—	Discrete	„	—	Inf.	—	———	794
1383	2850	R. E.	M.	32	„	20	—	—	—	Mild	„	—	Inf.	—	———	795
1384	2851	R. E.	M.	3	„	20	—	—	—	Confluent	„	—	Unvaccinated	—	———	795
1385	2852	H. M.	M.	17	„	21	—	—	—	Mild	„	—	Inf.	—	———	796
1386	2853	G. C.	M.	9	„	21	Apr. 20	Apr. 22	Apr. 23	Coherent	„	—	Apr. 16 4 taking	—	———	513
1387	2854	M. P.	F.	16	„	21	„ 16	„ 18	—	Mild	„	—	Inf. 2	—	———	797
1388	2855	S. B.	F.	45	„	21	—	—	—	Mild	„	—	Inf. 2	—	———	798
1389	2856	E. S.	F.	26	„	21	—	—	—	Confluent	D.	Apr. 25	Inf.	—	———	799
1390	2858	S. M.	M.	53	„	21	Apr. 19	Apr. 21	Apr. 22	Discrete	Rec.	—	Inf. 3 plain	—	———	782
1391	2859	E. C.	F.	24	„	21	„ 19	Apr. 21	„ 22	Mild	„	—	Inf. 4 foveate	—	2 or 3 pustules on face	800
1392	2860	M. P.	M.	25	„	21	—	—	—	Mild	„	—	Inf.	—	———	801
1393	2861	G. E.	M.	9	„	21	Apr. 17	Apr. 20	—	Coherent	„	—	Unvaccinated	—	———	519
1394	2862	P. E.	M.	6	„	21	„ 18	„ 20	—	Confluent	D.	Apr. 25	Unvaccinated	—	———	519
1395	2863	H. B.	F.	42	„	21	„ 19	„ 21	—	Coherent	Rec.	—	Inf.	—	———	802
1396	2865	W. S.	M.	33	„	21	„ 18	„ 21	—	Mild	„	—	Inf. 1 faint	Apr. 10. 4 marks.	———	803
1397	2866	C. B.	M.	5	„	21	—	—	—	Confluent	„	—	Unvaccinated	—	———	804
1398	2867	A. P.	M.	5	„	21	Apr. 18	Apr. 20	—	Confluent	D.	Apr. 25	Unvaccinated	—	———	805
1399	2868	C. W.	F.	7	„	21	„ 16	„ 18	—	Confluent	Rec.	—	About "10 days." 3 fair	—	———	586
1400	2869	M. T.	F.	14	„	21	„ 16	„ 18	—	Discrete	„	—	Inf.	—	———	649

No.	Name and Notification Number	Sex.	Age.	Date of Notification.	Date of Onset.	Date of Rash.	Date of Removal to Hospital.	Type of Attack.	Result.	Date of Death.	Vaccination. Date.	Vaccination. No. of Marks.	Re-vaccination Date.	Remarks.	No. in House Re-gister.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
				1896.											
1401	2871 P. P.	M.	4	Apr. 21	Apr. 16	Apr. 18	Apr. 23	Confluent	Rec.	—	Unvaccinated		—	——	502
1402	2872 T. C	M.	25	„ 21	„ 15	„ 17	„ 24	Confluent	D.	Apr. 27	Inf. (alleged).	No marks visible.	—	——	806
1403	2873 W. S.	M.	23	„ 21	„ 18	„ 20	—	Mild	Rec.	—	Inf.	—	—	——	807
1404	2874 W. C. S.	M.	5	„ 22	„ 18	„ 21	—	Confluent	„	—	Unvaccinated		—	Attempt at vaccination (April 13), 5 days before onset, failed.	808
1405	2875 K. S.	F	23	„ 22	„ 18	„ 21	—	Coherent	„	—	Inf.	3 faint	—	——	489
1406	2876 J. G.	M.	29	„ 22	—	—	—	Discrete	„	—	Inf.	—	—	——	809
1407	2877 E. W.	F.	63	„ 22	—	—	—	Mild	„	—	Inf.	—	—	——	810
1408	2878 C. M.	M.	1	„ 22	Apr. 17	Apr. 19	Apr. 23	Confluent	D.	Apr. 30	Unvaccinated		—	——	439
1409	2879 N. J.	F.	7	„ 22	„ 20	„ 22	„ 23	Confluent	Rec.	—	Unvaccinated		—	——	566
1410	2880 H. C.	M.	40	„ 22	„ 17	„ 19	„ 23	Discrete	„	—	Inf. (alleged).	No marks	—	——	811
1411	2881 M. A. Y.	F.	22	„ 22	„ 19	„ 20	—	Malignant	D.	Apr. 22	Inf.	Apr. 11 (1).	—	Died shortly after giving birth to child (No. 1561).	812
1412	2882 R. J.	M.	8 days	„ 22	—	—	—	Confluent	D.	„ 24	Unvaccinated		—	——	654
1413	2883 S. M.	M.	5	„ 22	Apr. 20	Apr. 22	Apr. 25	Confluent	Rec.	—	Unvaccinated		—	——	813
1414	2884 A. C.	F.	9	„ 22	„ 19	„ 21	—	Discrete	„	—	Apr. 16	—	—	——	814
1415	2885 E. W.	M.	19	„ 22	„ 18	„ 20	—	Discrete	„	—	Inf.	—	Apr. 13	——	815
1416	2886 E. W.	F.	4	„ 22	—	—	—	Confluent	„	—	Unvaccinated		—	——	56
1417	2887 A. P.	F.	28	„ 22	Apr. 15	Apr. 16	—	Discrete	„	—	Inf.	—	—	——	816
1418	2888 E. J. W.	F.	3	„ 22	„ 18	„ 20	Apr. 23	Confluent	D.	Apr. 26	Unvaccinated		—	——	817
1419	2889 A. A.	F.	14	„ 22	„ 17	„ 19	—	Mild	Rec.	—	Inf.	4 good	—	Attempt at re-vaccination on April 13 failed.	818
1420	2890 W. H.	M.	41	„ 22	„ 21	„ 23	Apr. 23	Malignant	D.	Apr. 26	Inf.	—	—	——	692
1421	2891 W. G.	M.	45	„ 23	„ 21	„ 23	—	Mild	Rec.	—	Inf.	—	—	Inoculated on forehead by one of children.	498
1422	2892 E. B.	F.	40	„ 23	„ 20	„ 22	Apr. 23	Discrete	„	—	Inf.	2 faint	Apr. 20 (1)	——	819
1423	2893 D. R.	F.	17	„ 23	„ 21	„ 23	„ 24	Discrete	„	—	Apr. 21	3 vesicles	—	Papules of various sizes	794
1424	2894 A. O.	F.	42	„ 23	„ 21	„ 23	„ 24	Mild	„	—	Inf.	3 faint	22 years ago (2).	——	820
1425	2895 W. O.	M.	22	„ 23	„ 21	„ 23	—	Mild	„	—	Inf.	—	Apr. 13 (4)	——	720
1426	2896 T. G.	M.	33	„ 23	„ 19	„ 21	Apr. 24	Confluent	„	—	Apr. 15	4 good	—	Doubt as to infantile vaccination.	535
1427	2897 J. S.	M.	60	„ 23	„ 21	„ 23	„ 23	Mild	„	—	Inf. (alleged).	No marks visible.	—	Attempt at re-vaccination 12 years ago failed.	821
1428	2898 W. P.	M.	24	„ 23	„ 18	„ 20	—	Coherent	„	—	Inf.	—	—	——	548
1429	2899 A. C.	F.	45	„ 23	—	—	—	Coherent	„	—	Inf.	—	—	Attempt at re-vaccination, April 17, no result.	822
1430	2900 J. D.	M.	24	„ 23	Apr. 16	Apr. 18	—	Mild	„	—	Inf.	—	Apr. 16	——	721
1431	2901 M. L.	F.	6	„ 23	„ 20	„ 22	—	Discrete	„	—	Apr. 20	—	—	——	823
1432	2902 C. E.	M.	4	„ 23	„ 21	„ 23	—	Coherent	„	—	Unvaccinated		—	——	519
1433	2904 G. A. P.	M.	2	„ 23	„ 21	„ 23	—	Confluent	„	—	Unvaccinated			——	554

1434	2906	A. W.	F.	24	„ 23	„ 20	„ 22	Apr. 24	Confluent	„	—	Inf.	2	—	—		739
1435	2907	E. E.	F.	64	„ 23	„ 16	„ 23	—	Mild	„	—	Inf.	—	—	—		585
1436	2908	K. K.	M.	16	„ 23	„ 18	„ 20	Apr. 24	Discrete	„	—	Inf.	3 faint	Apr. 17	—		468
1437	2909	L. C.	F.	65	„ 23	—	—	—	Discrete	„	—	Inf.	—	—	—		728
1438	2912	J. B.	M.	83	„ 24	Apr. 19	Apr. 22	—	Discrete	D.	Apr. 28	Inf.	—	—	—	Death from bronchitis	824
1439	2913	J. G.	M.	32	„ 24	„ 20	„ 21	—	Mild	Rec.	—	Inf.	—	—	—		506
1440	2914	T. G.	M.	39	„ 24	—	—	—	Mild	„	—	Inf.	—	—	—	Small-pox at 15 years of age	825
1441	2915	E. D.	F.	61	„ 24	Apr. 22	Apr. 24	—	Mild	„	—	Inf.	—	At 9 years old, and April 17.	—		826
1442	2917	G. B.	M.	25	„ 24	„ 19	„ 21	—	Mild	„	—	Inf.	—	—	—		855
1443	2918	J. C.	M.	25	„ 24	—	—	—	Mild	„	—	Inf.	—	Jan. 1, no result.	—	Arm was "bad" and poulticed	827
1444	2919	R. S.	F.	32	„ 24	—	—	—	Coherent	„	—	Inf.	—	—	—		828
1445	2920	L. M. H.	F	6	„ 24	—	—	—	Discrete	„	—	Unvaccinated		—	—		829
1446	2921	E. R.	M.	$\frac{3}{12}$	„ 24	Apr. 19	Apr. 21	—	Mild	„	—	Apr. 13	3 vesicles	—	—	Eruption—few scattered spots	632
1447	2922	S. L.	M.	37	„ 24	—	—	—	Confluent	D.	Apr. 29	Inf.	—	—	—		570
1448	—	J. L.	M.	11	—	Apr. 16	Apr. 18	—	Mild	Rec.	—	Inf.	—	Mar. 27	—		570
1449	2923	R. F.	M.	40	Apr. 24	„ 19	„ 21	Apr. 27	Discrete	„	—	Inf.	2 plain	7 days, no result.	—		830
1450	2924	M. G.	F.	28	„ 24	„ 19	„ 21	—	Discrete	„	—	Inf.	6 scars	Apr. 13	—		831
1451	2925	A. J. H.	F.	10wks.	„ 24	„ 19	„ 21	—	Discrete	„	—	Apr. 10	—	—	—		832
1452	2926	M. G.	F.	76	„ 24	„ 20	„ 22	Apr. 24	Discrete	„	—	Inf.	1 faint, 3 plain.	—	—		833
1453	2927	A. W.	F.	41	„ 24	„ 17	„ 19	—	Mild	„	—	Inf.	—	—	—		572
1454	3066	E. J. W.	M.	2 wks.	May 2	„ 28	„ 29	—	Confluent	D.	May 10	Unvaccinated		—	—		572
1455	2928	W. M.	M.	34	Apr. 24	„ 22	„ 24	—	Mild	Rec.	—	Inf.	—	—	—		257
1456	2929	A. S.	F.	18	„ 24	„ 17	„ 29	—	Mild	„	—	Inf.	—	6 weeks before, no result.	—		481
1457	2930	H. T.	M.	30	„ 24	„ 19	„ 21	Apr. 24	Discrete	„	—	Inf.	4 foveate	—	—		834
1458	2931	E. S.	M.	24	„ 24	„ 15	„ 23	—	Mild	„	—	Inf.	—	—	—		835
1459	2932	G. L.	M.	31	„ 24	„ 21	„ 22	—	Mild	„	—	Inf.	2 small	Feb., 2 insertions; no result.	—		836
1460	293	T. P.	M.	33	„ 24	„ 18	„ 20	—	Discrete	„	—	Inf.	—	Apr. 17 (1)	—		837
1461	2934	W. L.	M.	20	„ 24	„ 18	„ 20	Apr. 24	Mild	„	—	Inf.	4 plain	Apr. 20, no result.	—		838
1462	2935	C. W.	M.	10	„ 25	„ 23	„ 25	—	Mild	„	—	Inf.	4	—	—		839
1463	2936	A. A.	F.	45	„ 25	—	—	—	Confluent	D.	May 3	Inf.	—	—	—		573
1464	2937	W. B.	M.	28	„ 25	Apr. 22	Apr. 24	Apr. 26	Coherent	Rec.	—	Inf.	4 foveate	—	—	Delirium	609
1465	2238	W. R.	M.	1	„ 25	„ 24	„ 26	„ 27	Confluent	D.	Apr. 30	Apr. 16	2 vesicles	—	—		840
1466	2939	F. S.	F.	14	„ 25	—	—	—	Confluent	„	—	Unvaccinated		—	—		723
1467	2940	H. L.	F.	35	„ 25	—	—	—	Mild	„	—	Inf.	—	—	—		841
1468	2941	W. P.	M.	$\frac{11}{12}$	„ 25	Apr. 20	Apr. 22	—	Confluent	„	—	Unvaccinated		—	—		548
1469	2942	A. P.	F	16	„ 25	—	—	—	Discrete	„	—	Inf.	—	—	—		584
1470	2943	T. B.	M.	36	„ 25	Apr. 18	Apr. 20	—	Discrete	„	—	Inf.	—	—	—		842
1471	2944	L. W.	F	25	„ 25	„ 23	„ 25	—	Confluent	D.	May 5	Inf.	—	—	—		583
1472	2945	H. J. F.	M.	48	„ 25	„ 23	—	—	Malignant	D.	Apr. 25	Inf.	—	—	—	Death in prodromal stage from cardiac failure.	428
1473	2946	C. S.	M.	35	„ 25	„ 21	Apr. 23	Apr. 25	Discrete	Rec.	—	Inf.	1 faint	—	—		843
1474	2947	W. S.	M.	26	„ 25	„ 20	„ 22	„ 24	Confluent	„	—	Inf.	3 plain	—	—	Hæmorrhage into vesicles	844
1475	2948	E. M.	M.	41	„ 25	„ 19	„ 21	„ 27	Confluent	„	—	Inf. (alleged).	No marks visible.	—	—	Hæmorrhage into vesicles	753
1476	2949	G. R.	M.	$\frac{5}{12}$	„ 25	„ 19	„ 22	—	Confluent	D.	May 4	Unvaccinated		—	—		552

No.	Name and Notification Number.	Sex.	Age.	Date of Notification.	Date of Onset.	Date of Rash.	Date of Removal to Hospital.	Type of Attack.	Result.	Date of Death.	Vaccination. Date.	Vaccination. No. of Marks.	Re-vaccination Date.	Remarks.	No. in House Register.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
				1896.											
1477	2950 E. E.	F	49	Apr. 25	Apr. 23	Apr. 25	Apr. 26	Mild	Rec.	—	Inf.	—	—	——	577
1478	2951 F. H.	F	51	„ 25	„ 22	„ 23	„ 27	Confluent	„	—	Inf.	4 plain	—	Rapid desiccation	684
1479	2953 F. J.	M.	4	„ 25	„ 23	„ 25	„ 27	Confluent	D.	May 3	Within 7 days of attack.	4	—	——	845
1480	2954 A. P.	F.	35	„ 25	„ 21	„ 24	—	Coherent	Rec.	—	Inf.	—	—	——	846
1481	2955 A. A.	F.	30	„ 25	„ 23	„ 25	Apr. 26	Mild	„	—	Inf.	4 foveate	—	——	847
1482	2956 A. L.	M.	17	„ 25	„ 19	„ 23	—	Mild	„	—	Inf.	3 faint	—	——	848
1483	2957 F. H.	M.	55	„ 26	„ 23	„ 25	Apr. 28	Confluent	„	—	Aged 2	2 faint	—	——	849
1484	2958 T. E. R.	M.	4	„ 26	„ 22	„ 23	—	Confluent	D.	May 4	Apr. 17	2 vesicles	—	——	894
1485	2959 J. W.	M.	61	„ 26	„ 22	„ 24	Apr. 26	Confluent	D.	May 1	Unvaccinated		—	Hæmorrhage into vesicles	850
1486	2960 J. J.	M.	39	„ 26	—	—	—	Mild	Rec.	—	Inf.	—	—	——	851
1487	2962 H. H.	M.	25	„ 26	Apr. 23	Apr. 25	—	Discrete	„	—	Inf.	—	April 4 (1)	——	852
1488	2963 W. H.	M.	32	„ 26	„ 21	„ 23	—	Discrete	„	—	Inf.	1 foveate	—	——	626
1489	2964 F. D.	F.	17days	„ 26	—	—	—	Confluent	D.	Apr. 28	Unvaccinated		—	——	721
1490	2966 M. B.	F.	29	„ 27	Apr. 23	Apr. 26	—	Mild	Rec.	—	Inf.	—	—	——	853
1491	2967 T. J.	M.	15	„ 27	„ 20	„ 21	—	Mild	„	—	Inf.	4 smooth	—	Xeroderma	566
1492	2968 G. E. W.	M.	6	„ 27	„ 23	„ 24	—	Confluent	D.	May 4	Unvaccinated		—	——	678
1493	2969 L. N.	F.	2	„ 27	„ 26	„ 28	Apr. 29	Confluent	Rec.	—	Unvaccinated		—	——	854
1494	2970 E. M. C.	F.	8	„ 27	„ 23	„ 25	—	Coherent	„	—	Apr. 18	2 vesicles	—	Full large pustules on hands	761
1495	2971 J. B.	M.	21	„ 27	„ 22	„ 24	—	Confluent	„	—	Inf.	2	April 17 (1)	——	855
1496	2972 A. W.	F.	4	„ 27	„ 21	„ 25	—	Confluent	„	—	Unvaccinated		—	——	857
1497	2973 C. McK.	M.	7	„ 27	„ 21	„ 23	Apr. 27	Confluent	„	—	Unvaccinated		—	——	856
1498	2974 W. T.	M.	1	„ 27	„ 24	„ 26	—	Coherent	„	—	Unvaccinated		—	——	338
1499	2975 E. P.	F.	42	„ 27	„ 21	„ 23	—	Mild	„	—	Inf.	—	April 15	——	673
1500	2976 F. R.	F.	23	„ 27	„ 19	„ 21	—	Discrete	„	—	Unvaccinated		—	Fully formed large pustules with areolæ on face and arms. Three attempts at vaccination in infancy failed.	632
1501	2977 G. R.	M.	7	„ 27	„ 22	„ 24	—	Coherent	„	—	Apr. 13	3 large vesicles.	—	Fully formed pustules on face; considerable aggregation round vaccine vesicles.	632
1502	2978 D. T.	M.	44	„ 27	„ 25	„ 27	—	Discrete	„	—	Inf.	—	Apr. 18 (1)	——	858
1503	2979 A. A. B.	F.	9	„ 27	„ 24	„ 27	Apr. 28	Confluent	„	—	Unvaccinated		—	——	859
1504	2980 G. P.	M.	20	„ 27	„ 25	„ 27	„ 28	Mild	„	—	Inf.	3 faint	—	——	860
1505	2981 S. A. P.	F.	29	„ 27	„ 24	„ 26	—	Mild	„	—	Inf.	3 „	—	——	861
1506	2982 M. W.	F.	14	„ 27	„ 24	„ 26	—	Discrete	„	—	Inf.	4 „	—	——	739
1507	2983 A. W.	M.	2	„ 27	„ 24	„ 26	—	Confluent	„	—	Unvaccinated		—	——	739
1508	2984 F. M.	M.	24	„ 27	„ 23	„ 27	—	Discrete	„	—	Inf.	—	—	——	862
1509	2985 F. N.	F.	7	„ 27	„ 25	„ 27	Apr. 28	Coherent	„	—	Unvaccinated		—	Pustules of various sizes	854
1510	2986 K. H.	F.	4	„ 27	„ 19	„ 23	—	Coherent	„	—	Unvaccinated		—	Numerous small pustules	863
1511	2987 A. L.	M.	5	„ 27	„ 21	„ 24	—	Confluent	„	—	Unvaccinated		—	——	678
1512	2988 E. W.	M.	15	„ 27	„ 22	„ 24	—	Mild	„	—	Inf.	4 large	—	——	678
1513	2989 L. M.	F.	7	„ 27	—	—	—	Confluent	„	—	Unvaccinated		—	——	560

1514	2990	A. M.	F.	6	„	27	—		—		—	Confluent	D.	Apr. 27	Unvaccinated		—		560
1515	2991	F. F.	F.	3	„	27	Apr.	24	Apr.	26	—	Confluent	Rec.	—	Unvaccinated		—		400
1516	2992	B. F.	F.	4	„	27	„	24	„	26	—	Confluent	„	—	Unvaccinated		—		400
1517	2993	L. G.	F.	17	„	27	„	24	„	26	—	Mild	„	—	Inf.	3 large	—		400
1518	2995	B. G.	M.	8	„	28	„	31	„	23	—	Discrete	„	—	Unvaccinated		—		498
1519	2996	E. B.	F.	26	„	28	„	22	„	24	Apr. 29	Discrete	„	—	Inf.	2 foveate	—		313
1520	2997	C. W.	F.	30	„	28	„	23	„	25	„ 29	Mild	„	—	Inf.	—	—		817
1521	2998	G. W.	M.	7	„	28	„	25		28	„ 29	Malignant	D.	May 1	Apr. 22	3 vesicles	—	Profuse hæmaturia; extensive purpura hæmorrhagica on abdomen and legs.	817
1522	2999	E. W.	F.	8	„	28	„	26	„	28	—	Confluent	Rec.	—	Unvaccinated		—		612
1523	3000	A. W.	M.	12	„	28	„	26	„	28	—	Confluent	„	—	Unvaccinated		—		612
1524	3002	E. B.	M.	34	„	28	„	23	„	25	—	Discrete	„	—	Inf.	—	—		420
1525	3003	E. M.	F.	17	„	28	„	24	„	26	Apr. 29	Coherent	„	—	Unvaccinated		—		192
1526	3004	L. L.	F.	16	„	28	„	24	„	26	—	Discrete	„	—	Inf.	4	Mar. 14 & 21 (1 imperfect scar).	Papules minute	864
1527	3005	A. R.		7	„	28	„	23	„	24	—	Coherent	„	—	Aged 1 yr.	No marks visible.	—	Said to have had four insertions	865
1528	3006	H. R.	M.	4	„	28	„	22	„	23	—	Confluent	„	—	Unvaccinated		—		865
1529	3007	E. P.	F.	34	„	28	—		—		—	Mild	„	—	Inf.	—	—		867
1530	3008	J. T.	M.	30	„	28	Apr.	26	Apr.	28	—	Coherent	„	—	Unvaccinated		—	Bears no evidence of having been vaccinated. Remembers his parents saying he was not. Native of Chorlton Kings, Cheltenham.	630
1531	3009	L. W.	F.	52	„	28	„	25	„	29	Apr. 29	Coherent	„	—	Inf.	1 faint	—		702
1532	3010	F. E.	M.	18	„	28	„	23	„	28	—	Discrete	„	—	Inf.	—	—		866
1533	3011	R. S.	F.	19	„	28	„	26	„	28	—	Confluent	„	—	Inf.	4 smooth	—		671
1534	3012	F. P.	F.	26	„	29	„	24	„	26	—	Malignant	D.	Apr. 29	Inf.	—	—	Confined of stillborn child two days before death.	554
1535	3013	V. F.	M.	9	„	29	„	25	„	27	—	Confluent	D.	May 6	Unvaccinated		—		868
1536	3014	G. C.	F.	10	„	29	„	21	„	24	—	Mild	Rec.	—	Apr. 13	3 vesicles	—		869
1537	3015	M. A. B.	F.	38	„	29	„	24	„	26	—	Mild	„	—	Inf.	—	—		870
1538	3016	S. A. H.	F.	11	„	29	„	24	„	27	—	Discrete	„	—	Inf.	4 foveate	—		687
1539	3017	A. M.	M.	20	„	29	„	27	„	29	Apr. 29	Discrete	„	—	Inf.	3 plain, 1 foveate.	Apr. 21 (3)		192
1540	3018	T. T.	M.	32	„	29	„	25	„	28	—	Confluent	„	—	Inf.	—	Apr. 17, no result.		357
1541	3019	E. C.	F.	56	„	29	—		—		—	Mild	„	—	Inf.	—	—		574
1542	3020	W. B.	M.	5	„	29	Apr.	26	Apr.	29	Apr. 30	Confluent	D.	May 4	Unvaccinated		—	With hæmorrhages	871
1543	3021	E. P.	F.	23	„	29	„	25	„	27	—	Mild	Rec.	—	Inf.	—	—		666
1544	3022	E. H.	M.	5	„	29	„	22	„	24	Apr. 30	Confluent	D.	May 3	Unvaccinated		—		872
1545	3023	W. M.	M.	32	„	30	„	28	„	28	—	Mild	Rec.	—	Inf.	—	—		873
1546	3024	Mrs. G.	F.	56	„	30	„	25	„	27	—	Coherent	„	—	Inf.	—	—		874
1547	3025	G. H.	F.	3 weeks.	„	30	„	28	„	30	—	Confluent	D.	May 7	Unvaccinated		—	Rash gradually evolved	875
1548	3026	E. J. H.	M.	7	„	30	„	29	May	1	May 2	Coherent	Rec.	—	Unvaccinated		—		863
1549	3027	E. W.	F.	62	„	30	„	26	Apr.	30	—	Discrete	„	—	Inf.	—	—		876
1550	3028	W. P.	M.	24	„	30	„	24	„	26	May 2	Discrete	„	—	Inf.	1 plain 2 faint.	Apr. 20 (3)		877
1551	3029	G. S.	M.	32	„	30	„	28	„	30	—	Mild	„	—	Inf.	—	—		752
1552	3030	H. S.	M.	18	„	30	—		—		—	Discrete	„	—	Inf.	—	—		722
1553	3031	B. L.	F.	3	„	30	—		—		—	Mild	„	—	Unvaccinated		—		722

No.	Name and Notification Number.	Sex.	Age.	Date of Notification.	Date of Onset.	Date of Rash.	Removal to Hospital.	Type of Attack.	Result.	Date of Death.	Vaccination. Date.	Vaccination. No. of Marks.	Re-vaccination Date.	Remarks.	No. in House Register.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
				1896.											
1554	3032 J. G.	M.	17	April 30	April 25	April 27	—	Mild	Rec.	—	Inf.	4 scars (2 foveate).	At 10 and April 27	——	878
1555	3033 C. W.	F.	6	„ 30	„ 26	„ 29	—	Confluent	„	—	Unvaccinated		—	——	107
1556	3034 V. M. T.	F.	4/12	„ 30	„ 28	„ 30	May 1	Malignant	D.	May 4	Unvaccinated		—	Child of No. 1231. Taken to House 96 on death of mother. Flat papules and purpuric patches over face and limbs.	706
1557	3035 E. W.	M.	32	„ 30	„ 28	„ 30	„ 2	Confluent	Rec.	—	Inf.	Marks?	—	Hæmorrhage	879
1558	3037 A. H.	M.	4	„ 30	„ 28	„ 30	„ 2	Confluent	D.	May 7	Unvaccinated		—	——	880
1559	3038 E. W.	F.	40	„ 30	„ 28	„ 30	—	Confluent	Rec.	—	Inf.	—	—	——	857
1560	3040 A. K.	M.	1	„ 30	„ 26	„ 26	—	Discrete	„	—	Unvaccinated		—	——	674
1561	3041 —. Y.	M.	8 days	„ 30	—	„ 28	—	Confluent	D.	May 3	Unvaccinated		—	Born April 22	812
1562	3043 F. P.	M.	4	„ 30	April 28	„ 30	May 1	Coherent	Rec.	—	Unvaccinated		—	Pustules on face of various sizes	881
1563	3044 A. Y.	F.	21	„ 30	„ 25	„ 27	April 30	Mild	„	—	Inf.	4 foveate	At 10. No result.	——	882
1564	3045 W. H.	M.	47	„ 30	„ 25	„ 27	—	Mild	„	—	Inf.	—	—	——	883
1565	3046 T. F.	M.	23	„ 30	„ 27	„ 28	—	Discrete	„	—	Inf.	2 scars	—	——	884
1566	3047 F. M.	M.	5	May 1	—	—	—	Confluent	D.	May 8	Unvaccinated		—	——	510
1567	3048 E. G.	F.	51	„ 1	April 27	April 29	—	Discrete	Rec.	—	Inf.	—	—	——	885
1568	3049 W. T.	M.	32	„ 1	„ 28	„ 30	—	Coherent	„	—	Inf.	—	—	——	886
1569	3050 J. R.	M.	20	„ 1	„ 25	„ 29	—	Discrete	„	—	Inf.	4 scars	—	——	887
1570	3051 D. H.	F.	3	„ 1	„ 29	„ 30	—	Discrete	„	—	Unvaccinated		—	——	888
1571	3053 J. B.	M.	35	„ 1	„ 29	May 1	—	Confluent	„	—	Inf.	—	—	——	889
1572	3054 E. R.	F.	31	„ 1	„ 28	April 29	—	Confluent	„	—	Inf.	—	April 25. No result.	——	890
1573	3055 E. D.	F.	56	„ 1	„ 27	„ 30	May 1	Coherent	„	—	Inf.	2 faint	—	Said to have had small-pox in childhood. Pustules multiform.	891
1574	3056 E. A.	F.	46	„ 1	„ 27	„ 29	—	Discrete	„	—	Inf.	—	—	——	892
1575	3057 W. T.	M.	19	„ 1	„ 21	„ 24	—	Discrete	„	—	Inf.	3 foveate	—	——	893
1576	3059 E. F.	M.	22	„ 2	„ 30	May 2	—	Mild	„	—	Inf.	—	3 weeks	——	894
1577	3060 C. G.	M.	70	„ 2	„ 26	„ 1	May 3	Mild	„	—	At 10	2 faint, 2 plain.	—	——	645
1578	3061 P. V.	M.	55	„ 2	„ 29	„ 1	„ 2	Coherent	„	—	At 4	2 plain	April 25 (4)	——	776
1579	3062 B. S.	F.	17days	„ 2	—	—	—	Malignant	D.	May 2	Unvaccinated		—	——	745
1580	3063 E. G.	F.	34	„ 2	April 26	April 30	May 1	Discrete	Rec.	—	Inf.	1 foveate	—	Confined April 6	672
1581	3064 M. H.	F.	13	„ 2	„ 27	„ 29	—	Coherent	„	—	Inf.	4 foveate	—	——	466
1582	3097 W. H.	M.	6	„ 5	„ 27	May 3	—	Confluent	„	—	Unvaccinated		—	Vaccinated in 4 places on April 30 without result.	466
1583	3065 A. P.	M.	5	„ 2	„ 25	April 26	—	Discrete	„	—	Unvaccinated		—	——	895
1584	3067 F. W.	M.	8	„ 2	„ 28	May 1	—	Discrete	„	—	Inf.	1 foveate scar about ½-in.	—	——	107

1585	3068	C. H.		F.	3	„	2	„	27	April	30	—	Confluent	„	—	April 24	—	—	Attempted vaccination on April 10 failed.		900
1586	3070	J. M.		F.	3	„	2	„	28	„	30	—	Confluent	D.	May 7	April 27	3 meagre marks.	—			862
1587	3071	H. P.		F.	2	„	2	„	28	„	30	—	Confluent	Rec.	—	April 22	Slight scar	—			527
1588	3072	E. R.		M.	43	„	2	„	28	„	30	May 3	Coherent	„	—	Inf.	3 plain	April 13. No result.			741
1589	3073	M. D.		F.	6	„	2	„	26	May	1	—	Confluent	„	—	Unvaccinated		—			634
1590	3074	H. M.		F.	55	„	3	„	27	April	29	—	Mild	„	—	Inf.	—	—			686
1591	3075	M. A. G.		F.	43	„	3	„	30	May	2	—	Discrete	„	—	Inf.	—	—			896
1592	3076	J. K.		M.	66	„	3	May	1	„	3	May 3	Confluent	D.	May 8	Aged 4	—	—			897
1593	3077	E. P.		F.	61	„	4	April	30	„	3	—	Confluent	D.	„ 13	Inf.	—	—			898
1594	3078	E. B.		M.	38	„	4	May	1	„	1	—	Coherent	Rec.	—	Inf.	—	April 25. No result.			899
1595	3079	S. H.		F.	23	„	4	April	26	April	28	—	Mild	„	—	Inf.	—	April 20. No result.			762
1596	3080	J. W.		M.	23	„	4	„	30	May	3	—	Discrete	„	—	Inf.	3 scarred	April 23 (2 insertions, 1 taking slightly).			902
1597	3081	H. C.		M.	18	„	4	„	30	„	2	May 3	Confluent	„	—	Unvaccinated		—			903
1598	3082	S. C.		M.	3	„	4	May	1	„	4	—	Confluent	„	—	Unvaccinated		—			904
1599	3083	W. G.		M.	15	„	4	April	29	„	1	May 3	Discrete	„	—	Inf.	4 plain	April 20 & 29; failed.			905
1600	3084	E. F. T.		F.	8	„	4	„	29	„	1	—	Confluent	D.	May 10	Unvaccinated		—			906
1601	3085	H. L.		F.	36	„	4	„	25	April	25	—	Mild	Rec.	—	Inf.	—	—	Inoculated on lip, by infant		744
1602	3086	F. W.		F.	23	„	4	May	4	May	4	—	Mild	„	—	Inf.	—	—			907
1603	3387	A. V.		F.	15	„	5	„	1	„	3	—	Mild	„	—	Inf.	—	April 28 (1)			908
1604	3088	J. B.		M.	27	„	5	„	2	„	4	—	Discrete	„	—	Inf.	—	—			909
1605	3089	F. P.			14	„	5	„	1	„	3	May 6	Mild	„	—	Inf.	4	—			805
1606	—	M. M.			4	„	30	„	25	„	26	—	Coherent	„	—	Unvaccinated		—			1005
1607	3091	W. W.		M.	8	„	5	April	28	April	30	—	Confluent	„	—	Inf.	2 faint	—			276
1608	3092	J. Y.		M.	16	„	5	„	28	„	30	—	Discrete	„	—	Inf.	2 foveate	—			910
1609	3093	W. M.		M.	52	„	5	„	26	„	28	—	Mild	„	—	Inf.	—	April 23 (3)			911
1610	3094	A. H.		F.	32	„	5	„	26	„	29	—	Discrete	„	—	Inf.	—	—			633
1611	3095	E. G.		F.	5	„	5	„	28	„	30	—	Discrete	„	—	April 24	3 vesicles	—			725
1612	3096	H. A.		F.	41	„	5	May	1	May	3	—	Mild	„	—	Inf.	—	—			704
1613	3098	H. P.		M.	4	„	5	„	1	„	3	—	Confluent	D.	May 7	Unvaccinated		—	Hæmorrhage into pocks		895
1614	3099	A. H.		M.	23	„	5		3	„	5	—	Mild	Rec.	—	Inf.	2 foveate	—			913
1615	—	A. P.		M.	25	—		„	3	„	5	May 5	Confluent	„	—	Inf.	4 plain	—			914
1616	3103	J. G. W.		M.	21	May	6	April	30	„	2	—	Discrete	„	—	Inf.	3 foveate	Twice. No result			734
1617	3104	A. K.		F.	24	„	6	May	3	„	5	May 6	Confluent	„	—	Inf.	—	—			915
1618	3105	M. C.		F.	30	„	6	April	24	April	26	—	Mild	„	—	Inf.	—	—			665
1619	3106	C. C.		F.	5	„	6	„	30	May	3	—	Confluent	„	—	Unvaccinated		—	Pustules full. Face œdematous		916
1620	3107	G. E.		M.	25	„	6	May	1	„	3	—	Confluent	„	—	Inf.	—	April 27. No result.			917
1621	3108	E. J.		F.	31	„	6	„	3	„	5	May 6	Malignant	D.	May 10	Inf.	1 faint	—			790
1622	3109	H. B.		M.	17	„	6	„	3	„	6	—	Confluent	Rec.	—	Inf.	4 plain	—			918
1623	3110	S. Y.		F.	53	„	6	„	1	„	5	—	Mild	„	—	Inf.	—	—			919
1624	3111	A. F.		F.	39	„	6	„	1	„	3	—	Confluent	„	—	Inf.	—	3 weeks ago, no result.			894
1625	3112	P. R.		F.	32	„	6	„	1	„	5	—	Discrete	„	—	Inf.	—	—			920
1626	3113	E. T.		F.	32	„	6	„	2	„	4	—	Mild	„	—	Inf.	—	—			772
1627	3114	S. P.		F.	40	„	6	„	3	„	5	May 7	Coherent	„	—	Inf.	3 plain	3 weeks ago, no result.			921

No.	Name and Notification Number.	Sex.	Age.	Date of Notification.	Date of Onset.	Date of Rash.	Date of Removal to Hospital.	Type of Attack.	Result.	Date of Death.	Vaccination. Date.	Vaccination. No. of Mark.	Re-vaccination Date.	Remarks.	No. in House Register.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
				1896.											
1628	3115 S. R.	F.	52	May 6	May 5	May 7	—	Mild	Rec.	—	Inf.	—	Aged 5 years	——	887
1629	3116 M. A. D.	F.	50	„ 7	Apr. 28	Apr. 30	—	Mild	„	—	Inf.	—	—	——	922
1630	3117 F. P.	M.	30	„ 7	May 4	May 6	—	Discrete	„	—	Inf.	3 foveate	—	——	923
1631	3118 W. S.	M.	40	„ 7	„ 3	„ 5	—	Confluent	D.	May 12	Inf.	—	—	——	924
1632	3119 J. S.	F.	½	„ 7	—	—	—	Confluent	D.	„ 8	Unvaccinated		—	——	786
1633	3120 E. T.	F.	39	„ 7	May 1	May 4	May 8	Discrete	Rec.	—	Inf.	1 foveate	—	Large pustules on face	926
1634	— A. S.	F.	11	—	—	—	—	Mild	„	—	Inf.	—	—	Case not recognised	924
1635	3122 T. B.	M.	30	May 7	—	—	—	Confluent	D.	May 10	Unvaccinated		—	——	804
1636	3124 E. P.	M.	1/12	„ 7	May 4	May 6	—	Coherent	Rec.	—	May 4	4 vesicles	—	——	805
1637	3125 E. M.	F.	43	„ 7	„ 3	„ 5	May 12	Discrete	„	—	Unvaccinated		—	——	813
1638	3126 A. R.	M.	29	„ 7	„ 3	„ 6	—	Confluent	D.	June 7	Inf.	—	—	——	927
1639	3127 F. T.	F.	16	„ 7	„ 2	„ 6	—	Discrete	Rec.	—	Inf.	—	—	——	649
1640	3128 E. G.	F.	27	„ 7	„ 5	„ 7	—	Mild	„	—	Inf.	—	—	——	928
1641	3129 M. G.	F.	25	„ 7	Apr. 15	Apr. 17	—	Discrete	„	—	Inf.	—	—	——	929
1642	3130 L. M. B.	F.	12	„ 7	May 4	May 5	—	Mild	„	—	Inf.	4 large	—	A doubtful case	930
1643	3131 C. W. T.	M.	15	„ 7	„ 5	„ 7	—	Mild	„	—	Inf.	2 scars	Apr. 9, no result.	——	931
1644	3132 E. S.	M.	40	„ 7	„ 4	„ 6	—	Mild	„	—	Inf.	—	—	Infected while attending cases	932
1645	3133 G. U.	M.	23	„ 7	„ 3	„ 7	—	Mild	„	—	Inf.	—	—	——	933
1646	3134 M. B.	F.	4	„ 8	„ 2	„ 5	—	Confluent	D.	May 14	Apr. 28, no result.	Unvaccinated.	—	Hæmorrhage	934
1647	3135 C. M. J.	F.	10	„ 8	„ 2	„ 4	—	Confluent	D.	„ 12	Unvaccinated		—	——	935
1648	3136 F. D.	F.	21	„ 8	„ 5	„ 7	—	Discrete	Rec.	—	Inf.	—	—	——	936
1649	3137 M. A. J.	F.	45	„ 8	„ 5	„ 7	—	Coherent	„	—	Inf.	—	Apr. 28, no result.	Stated that she had a severe attack of small-pox after birth, her mother having a mild attack at the time.	616
1650	3138 M. D.	F.	48	„ 8	„ 4	„ 8	May 9	Discrete	„	—	Inf.	3 faint	Apr. 30 (1 taking).	——	752
1651	3139 N. E.	F.	11	„ 8	„ 5	„ 7	„ 9	Mild	„	—	Inf.	4 smooth	Apr. 27 (2 places).	——	577
1652	3141 J. T.	M.	49	„ 8	„ 4	„ 7	—	Discrete	„	—	Inf.	—	Apr. 27 (1, slight).	Eruption pustular	937
1653	3142 J. P.	M.	8	„ 8	„ 2	„ 4	—	Malignant	D.	May 9	Unvaccinated		—	——	938
1654	3143 E. P. F.	M.	8	„ 8	„ 4	„ 6	May 8	Confluent	D.	„ 14	Unvaccinated		—	——	939
1655	3144 G. F. McK.	M.	39	„ 8	„ 4	„ 7	„ 12	Coherent	Rec.	—	Inf.	Not visible	Apr. 29	——	856
1656	3145 E. L. J.	M.	4	„ 8	„ 6	„ 7	—	Malignant	D.	May 9	Apr. 24	—	—	A delicate child	241
1657	3146 C. W. F.	M.	35	„ 9	„ 3	„ 6	—	Confluent	D.	„ 16	Unvaccinated		—	Mother stated that he had never been vaccinated; they were "moving house" at the time.	941
1658	3147 E. F.	M.	42	„ 9	„ 6	„ 7	—	Discrete	Rec.	—	Inf.	—	—	——	942
1659	3148 J. G. C.	M.	5	„ 9	„ 5	„ 8	—	Coherent	„	—	Unvaccinated		—	——	943
1660	3150 N. C.	F.	19	„ 9	„ 1	„ 5	—	Confluent	„	—	Inf.	—	—	——	652
1661	3151 F. W.	F.	32	„ 9	Apr. 30	„ 3	—	Coherent	„	—	Inf.	—	—	——	767

1662	3152	H. E. B.	F.	33	„	9	—	„	8	—	Discrete	„	—	Inf.	—	—	——	944
1663	3153	J. B.	M.	27	„	9	May 5	„	7	May 9	Coherent	„	—	Inf.	3 faint	—	——	945
1664	3155	M. A. P.	F.	32	„	9	„ 7	„	7	—	Confluent	D.	May 12	Inf.	—	—	Abortion, 6 months	946
1665	3156	J. P.	F.	3	„	9	„ 4	„	7	—	Confluent	Rec.	—	May 4	4 vesicles	—	——	805
1666	3157	H. S.	F.	3	„	9	„ 7	„	9	—	Coherent	„	—	Unvaccinated		—	——	947
1667	3158	G. G.	M.	8	„	9	„ 5	„	7	—	Coherent	„	—	Unvaccinated		—	Followed scarlet fever	925
1668	3159	J. M.	M.	9	„	9	„ 5	„	7	May 12	Coherent	„	—	Apr. 30	2 vesicles	—	——	813
1669	3160	L. P.	F.	22	„	9	„ 4	„	6	—	Discrete	„	—	Inf.	—	Apr. 30 (3)	——	948
1670	3161	H. W.	M.	6	„	9	„ 5	„	8	—	Confluent	„	—	Unvaccinated		—	——	56
1671	3162	A. W.	M.	3	„	9	„ 5	„	8	—	Confluent	D.	May 14	Unvaccinated		—	——	56
1672	3163	J. J.	F.	30	„	9	„ 6	„	8	—	Malignant	D.	„ 18	Inf.	7 scars	—	Scanty rash; delirium; coma; exhaustion.	949
1673	3164	F. W.	M.	20	„	9	„ 6	„	9	—	Coherent	Rec.	—	Inf.	3 plain	—	——	950
1674	3165	C. S.	F.	38	„	9	„ 4	„	9	—	Coherent	„	—	Unvaccinated		—	Mother said to have had small-pox at time of birth of C. S. Severe hysteria.	932
1675	3166	J. B.	M.	60	„	9	„ 5	„	7	May 9	Discrete	„	—	Inf.	2 faint	Aged 14, no result; Apr. 25 (3).	Small-pox at 13 years of age	951
1676	3167	E. A. B.	F.	30	„	9	„ 6	„	8	„ 11	Coherent	„	—	Inf.	—	May 5 (2 taking).	——	871
1677	3168	H. H.	M.	25	„	9	„ 7	„	9	—	Mild	„	—	Inf.	3 foveate	—	——	952
1678	3170	M. G.	F.	38	„	10	„ 5	„	7	—	Malignant	D.	May 14	Unvaccinated		—	——	498
1679	3171	E. J.	F.	48	„	10	„ 9	„	10	—	Mild	Rec.	—	Inf.	—	9 and 18 years ago.	——	953
1680	3172	M. E. J.	F.	26	„	10	„ 6	„	8	—	Mild	„	—	Inf.	4 plain	—	——	954
1681	3173	A. C.	M.	64	„	10	„ 5	„	6	—	Confluent	D.	May 14	Inf.	—	—	——	728
1682	3174	M. L.	F.	51	„	10	„ 8	„	10	May 11	Confluent	D.	„ 25	Aged 7 yrs.	2 faint	—	Sister to No. 1483	849
1683	3175	M. P.	F.	8	„	10	„ 8	„	10	„ 11	Confluent	D.	„ 21	Unvaccinated		—	——	895
1684	3176	H. G.	F	5 wks.	„	10	„ 8	„	10	„ 11	Confluent	D.	„ 15	Unvaccinated		—	——	672
1685	3177	K. S.	F.	33	„	10	„ 9	„	10	—	Confluent	Rec.	—	Inf.	—	—	——	808
1686	3178	J. T.	M.	34	„	11	„ 5	„	10	—	Discrete	„	—	Inf.	—	—	——	772
1687	3179	P. H.	F.	21	„	11	„ 8	„	5	—	Discrete	„	—	Inf.	—	—	——	955
1688	3180	A. S.	F.	1	„	11	„ 5	„	9	—	Confluent	D.	May 18	May 4	—	—	Pustules of various sizes	956
1689	3181	A. C.	F.	10	„	11	„ 7	„	9	—	Confluent	Rec.	—	Unvaccinated		—	——	957
1690	3186	W. B.	M.	22	„	12	„ 6	„	8	May 11	Mild	„	—	Inf.	2 foveate	—	——	962
1691	3183	W. E.	M.	45	„	11	„ 8	„	11	—	Discrete	„	—	Inf.	—	—	——	959
1692	3184	W. L.	M.	40	„	11	„ 4	„	5	—	Mild	„	—	Inf.	—	—	——	823
1693	3185	F. E.	M.	70	„	11	„ 5	„	7	May 12	Mild	„	—	Inf.	2 faint	—	——	960
1694	—	G. B.	M.	38	„	14	„ 11	„	13	„ 14	Coherent	„	—	Inf.	3 faint	—	Hæmorrhage into vesicles	871
1695	3187	D. S.	F.	4	„	12	„ 7	„	9	—	Confluent	D.	May 16	Apr. 15	3 scabs	—	At my visit, on May 11, found eruption more marked on arms than face; at vaccination site three inflamed areas, one about ½″, two $\frac{3}{12}$″ diameter, each with dark scab in centre. She was vaccinated during her mother's attack, No. 1,207.	690
1696	3189	S. H.	M.	22	„	12	„ 11	„	12	—	Confluent	Rec.	—	Inf.	1 foveate	—	——	961
1697	—	E. U.	F.	24	—		—	—		—	Mild	„	—	Inf.	—	—	——	933
1698	3190	M. W.	F.	3	May	12	Apr. 21	Apr.	23	—	Mild	„	—	Unvaccinated		—	——	678
1699	3191	P. W.	F.	1	„	12	May 1	May	3	—	Confluent	D.	May 14	Unvaccinated		—	——	678
1700	3192	G. E. W.	M.	40	„	12	„ 9	„	12	—	Confluent	D.	„ 19	Unvaccinated		—	Born in Gloucester	678
1701	—	M. F. W.	F.	16	—		Apr. 28	Apr.	30	—	Mild	Rec.	—	Inf.	—	—	——	678

No.	Name and Notification Number.	Sex.	Age.	Date of Notification.	Date of Onset.	Date of Rash.	Date of Removal to Hospital.	Type of Attack.	Result.	Date of Death.	Vaccination. Date.	Vaccination. No. of Marks.	Re-vaccination Date.	Remarks.	No. in House Register.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
				1896.											
1702	3193 M. E.	F.	8	May 12	May 9	May 11	—	Coherent	Rec.	—	May 6	2 vesicles	—	Papules of various sizes	585
1703	3195 E. H.	F.	33	„ 12	„ 6	„ 7	—	Confluent	„	—	Inf.	—	—	Nursing infant, 7 months old, who was attacked later (No. 1822).	963
1704	3196 P. W.	M.	1	„ 12	—	„ 11	—	Discrete	„	—	Unvaccinated		—	——	56
1705	3197 M. L.	F.	7	„ 12	May 8	„ 9	—	Confluent	„	—	Unvaccinated		—	——	722
1706	3198 A. T.	F.	10/12	„ 12	„ 9	„ 11	—	Confluent	D.	May 28	Unvaccinated		—	——	964
1707	3199 M. G.	F.	3	„ 12	„ 9	„ 11	—	Confluent	D.	May 20	Unvaccinated		—	——	929
1708	3201 M. H.	F.	24	„ 12	„ 9	„ 11	—	Discrete	Rec.	—	Inf.	—	—	——	875
1709	3203 G. S.	M.	31	„ 13	„ 11	„ 12	—	Confluent	„	—	Inf.	—	—	——	828
1710	3204 W. G. P.	M.	13	„ 13	„ 11	„ 12	—	Mild	„	—	Inf.	4 foveate	—	——	584
1711	3205 L. E. T.	F.	5	„ 13	„ 9	„ 12	—	Confluent	„	—	Unvaccinated		—	——	965
1712	3206 E. M.	F.	25	„ 13	„ 10	„ 12	—	Confluent	„	—	Inf.	—	—	Hæmorrhage into pocks	862
1713	3207 A. H.	M.	40	„ 13	„ 10	„ 12	May 13	Confluent	D.	May 19	Aged 10	3 faint	24 years ago, no result.	Hæmorrhage into pocks	569
1714	3208 P. R.	F.	34	„ 13	„ 10	„ 12	—	Mild	Rec.	—	Inf.	—	—	——	865
1715	3209 S. T.	M.	13	„ 13	„ 11	„ 13	—	Mild	„	—	Inf.	—	Two attempts failed.	——	966
1716	3210 W. M.	M.	38	„ 13	„ 10	„ 12	—	Coherent	„	—	Inf.	—	May 5, no result.	——	967
1717	3211 H. B.	M.	70	„ 13	„ 8	„ 10	May 13	Confluent	D.	May 17	Aged 8	3 faint	—	Hæmorrhage into pocks	857
1718	3212 N. W.	F.	9	„ 13	„ 3	„ 5	„ 14	Confluent	Rec.	—	Unvaccinated		—	——	968
1719	3213 H. H.	M.	5	„ 13	„ 10	„ 12	—	Confluent	D.	May 22	May 7	—	—	——	969
1720	3214 M. H.	F.	32	„ 13	„ 5	„ 7	—	Mild	Rec.	—	Inf.	—	—	——	970
1721	3215 B. V.	F.	8	„ 13	„ 10	„ 12	—	Mild	„	—	Inf.	4	—	——	908
1722	3216 A. C. W.	M.	5/12	„ 13	„ 9	„ 11	—	Confluent	D.	May 23	May 7	—	—	——	801
1723	3217 A. M.	F.	7	„ 14	„ 7	„ 9	—	Confluent	D.	„ 20	Unvaccinated		—	——	971
1724	3218 G. J. E.	M.	32	„ 14	„ 9	„ 12	—	Discrete	Rec.	—	Inf.	—	—	——	972
1725	3219 R. B.	F.	9	„ 44	„ 11	„ 13	—	Mild	„	—	Inf.	—	—	——	842
1726	3221 F. F.	F.	22	„ 14	—	—	—	Confluent	D.	May 17	Inf.	—	—	——	884
1727	3222 W. C. D.	M.	40	„ 14	May 6	May 8	—	Discrete	Rec.	—	Inf.	—	Aged 9	Employed on small-pox hospital buildings.	973
1728	3223 S. M'L.	M.	30	„ 14	„ 12	„ 13	—	Discrete	„	—	Inf.	—	—	——	974
1729	3224 A. G.	F.	2	„ 14	„ 10	„ 12	—	Coherent	„	—	Unvaccinated		—	——	929
1730	3225 A. M.	M.	1	„ 14	„ 12	„ 14	—	Confluent	„	—	Unvaccinated		—	Attempt at vaccination, Apr. 20, failed.	862
1731	3226 C. C.	M.	21	„ 15	„ 10	„ 13	May 15	Mild	„	—	Inf.	4 plain	2 months ago, no result.	——	975
1732	— R. E.	F.	50	—	„ 16	„ 18	—	Discrete	„	—	Inf.	—	—	——	917
1733	3229 D. J. W.	M.	27	May 15	„ 9	„ 13	—	Discrete	„	—	Inf.	6	5 weeks ago, no result.	——	587
1734	3230 W. C.	M.	29	„ 15	„ 12	„ 14	—	Confluent	D.	May 20	Unvaccinated		—	Not vaccinated because of "delicacy" as infant.	976
1735	3231 D. W.	M.	3/12	„ 15	„ 8	„ 10	—	Coherent	Rec.	—	Unvaccinated		—	——	767
1736	3232 E. R.	M.	12	„ 15	„ 10	„ 12	—	Mild	„	—	Inf.	4 foveate	—	——	865

1737	—	A. T.	M.	26	—	„ 20	„ 22	—	Mild	„	—	Inf.	3 foveate	—			952
1738	3234	J. B.	M.	27	May 15	Apr. 29	Apr. 30	—	Coherent	„	—	Inf.	—	Apr. 27 (2 slight).			977
1739	3235	E. W.	F.	4/12	„ 15	May 14	May 15	—	Confluent	D.	May 24	May 7	3 vesicles	—			107
1740	3236	A. F.	M.	6	„ 15	„ 13	„ 14	—	Confluent	Rec.	—	Unvaccinated			—		868
1741	3237	S. B.	F.	35	„ 16	„ 13	„ 15	—	Mild	„	—	Inf	—		—		842
1742	3238	J. P.	M.	4/12	„ 16	„ 14	„ 16	May 17	Confluent	D.	May 21	Unvaccinated			—		895
1743	3239	S. C.	F.	2	„ 16	„ 15	„ 17	—	Confluent	D.	„ 26	May 14	(taking)		—		814
1744	3240	W. C.	M.	21	„ 16	„ 13	„ 15	—	Coherent	Rec.	—	Inf.	3		—		978
1745	3241	F. S.	M.	1	„ 16	„ 15	„ 17	—	Coherent	„	—	Unvaccinated			—		932
1746	3242	F. G. D.	M.	2	„ 17	„ 12	„ 14	—	Coherent	„	—	Unvaccinated			—		979
1747	3243	E. B.	F.	32	„ 17	„ 14	„ 16	May 17	Confluent	D.	May 24	Unvaccinated			—	Tuberculosis of lungs and skin; three attempts to vaccinate in infancy, without result.	980
1748	3244	E. W.	F.	65	„ 17	„ 11	„ 14	—	Discrete	Rec.	—	Inf.	—		—		877
1749	3245	R. B.	M.	3	„ 17	„ 15	„ 17	—	Confluent	„	—	Unvaccinated			—	Hæmorrhage into pocks; 2 failures to vaccinate 6 weeks ago.	981
1750	3246	A. E.	M.	26	„ 17	„ 8	„ 13	—	Discrete	„	—	Inf.	—		—		982
1751	3248	H. G.	M.	6	„ 18	„ 12	„ 14	—	Confluent	D.	May 23	Unvaccinated			—		498
1752	3249	H. G.	F.	4	„ 18	„ 12	„ 14	—	Confluent	D.	„ 23	Unvaccinated			—		498
1753	3250	S. W.	F.	55	„ 18	„ 15	„ 18	—	Confluent	D.	„ 24	Inf.	—		—		494
1754	3251	C. H.	M.	26	„ 18	„ 13	„ 15	—	Mild	Rec.	—	Inf.	4		—		983
1755	3252	S. S.	F.	22	„ 18	„ 14	„ 16	—	Coherent	„	—	Inf.	—		—		984
1756	3253	E. B.	F.	2	„ 18	„ 15	„ 17	—	Confluent	„	—	Unvaccinated			—		985
1757	3254	C. B.	F.	56	„ 18	„ 16	„ 18	—	Coherent	D.	June 6	Inf.	—		—		986
1758	3255	F. M. E.	F.	7	„ 18	„ 14	„ 16	—	Confluent	Rec.	—	Unvaccinated			—		987
1759	3256	J. C.	M.	27	„ 18	„ 15	„ 17	—	Confluent	„	—	Inf.	—		—		988
1760	3257	J. A.	M.	46	„ 18	„ 15	„ 17	—	Mild	„	—	Inf.	No marks	May 8 (2)			892
1761	3258	W. G.	F.	8/12	„ 18	„ 13	„ 14	—	Confluent	D.	May 23	Unvaccinated			—		989
1762	3259	J. L.	M.	24	„ 19	„ 13	„ 16	—	Confluent	Rec.	—	Inf.	—		—		565
1763	3261	A. D.	F.	8/12	„ 19	„ 15	„ 16	—	Confluent	D.	May 25	Unvaccinated			—	Failure to vaccinate, April 17	990
1764	3262	C. J. D.	M.	22	„ 19	„ 17	„ 19	—	Discrete	Rec.	—	Inf.	—		—		936
1765	3263	M. D.	F.	8	„ 19	„ 15	„ 17	—	Mild	„	—	Inf.	3 large, smooth.		—		364
1766	3264	J. D.	M.	55	„ 19	„ 16	„ 18	May 19	Confluent	D.	May 22	Inf. (alleged).	No marks		—	Hæmorrhage into skin	991
1767	3265	T. D.	M.	3	„ 19	„ 15	„ 17	—	Confluent	D.	„ 24	Unvaccinated			—		992
1768	3266	W. B.	M.	17days	„ 20	„ 17	„ 19	—	Malignant	D.	„ 23	Unvaccinated			—		944
1769	3267	A. P.	M.	44	„ 20	—	„ 16	—	Mild	Rec.	—	Inf.	3 marks(r) 3 marks(l)	20 years ago			805
1770	3313	A. H.	M.	16	„ 29	May 21	„ 26	—	Mild	„	—	Inf.	3 large	Twice failed (Mar. and Apr.)			1008
1771	3269	W. D.	F.	13	„ 20	„ 14	„ 18	—	Discrete	„	—	Inf.	3 good	—			993
1772	3270	J. B.	M.	29	„ 21	„ 16	„ 19	—	Discrete	„	—	Inf.	1 foveate	Mar. 29 (3 stains).		The marks of re-vaccination on May 25 were very small, superficial, and faint. Probably no scar would remain.	994
1773	3271	E. H.	F	1	„ 21	„ 17	„ 20	—	Confluent	D.	May 30	Unvaccinated			—		970
1774	3272	A. D.	M.	41	„ 21	„ 12	„ 16	—	Mild	Rec.	—	Inf.	—		—		995
1775	3273	E. T.	F.	46	„ 21	„ 19	„ 21	—	Mild	„	—	Inf.	—		—		649
1776	3274	W. O.	M.	10	„ 21	„ 19	„ 21	—	Mild	„	—	Inf.	—		—		996
1777	3275	F. B.	M.	21	„ 21	„ 19	„ 21	—	Discrete	„	—	Inf. ?	No marks		—		997
1778	3276	E. M.	F.	30	„ 21	„ 19	„ 21	—	Discrete	„	—	Inf.	—		—		998

No	Name and Notification Number.	Sex.	Age.	Date of Notification.	Date of Onset.	Date of Rash.	Date of Removal to Hospital.	Type of Attack.	Result.	Date of Death.	Vaccination. Date.	Vaccination. No. of Marks.	Re-vaccination Date.	Remarks.	No. in House Register.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
				1896.											
1779	3278 N. F. S.	F.	15	May 21	May 13	May 15	—	Mild	Rec.	—	Inf.	3 good	—	———	932
1780	3279 E. M.	M.	2	„ 22	—	„ 17	—	Discrete	„	—	May 9	3 good	—	Multiform pustules	510
1781	3280 L. B.	F.	7/12	„ 22	May 17	„ 19	—	Discrete	„	—	Unvaccinated		—	Attempted vaccination May 5th, nil.	938
1782	3281 M. C.	F.	7	„ 22	„ 19	„ 22	—	Coherent	„	—	Unvaccinated		—	———	904
1783	3284 A. W.	F.	24	„ 23	„ 14	„ 16	—	Coherent	„	—	Inf.	—	—	Contracted in nursing and bathing No. 1619.	916
1784	— E. W.	F.	10	„ 30	„ 25	„ 27	—	Mild	„	—	Inf.	2 faint	—	———	1027
1785	3330 E. Y.	F.	24	„ 30	„ 14	„ 17	—	Mild	„	—	Inf.	—	5 weeks ago, 1 slight mark.	Contracted in nursing No. 1624	934
1786	3324 W. S.	M.	5	„ 30	„ 17	„ 19	—	Confluent	„	—	Unvaccinated		—	———	924
1787	3325 E. S.	F.	9	„ 30	„ 18	„ 20	—	Mild	„	—	Unvaccinated		—	———	924
1788	3326 E. S.	F.	3	„ 30	„ 18	„ 20	—	Confluent	„	—	Unvaccinated		—	———	924
1789	— H. T.	M.	4	—	„ 16	„ 18	—	Confluent	„	—	Unvaccinated		—	———	999
1790	— H. S.	M.	18	—	„ 3	„ 7	—	Mild	„	—	Inf.	—	—	Infected whilst attending cases. Abscesses followed.	1000
1791	— C. H.	M.	16	—	„ 13	„ 15	—	Discrete	„	—	Inf.	—	Re-vaccinated April, failed.	———	1001
1792	— G. H.	M.	26	—	„ 15	„ 17	—	Mild	„	—	Inf.	—	6 weeks ago, no result.	———	1002
1793	3283 F. S.	F.	14	May 23	„ 17	„ 19	—	Discrete	„	—	Inf.	4 (2 foveate).	—	———	947
1794	3285 M. W.	F.	4	„ 23	„ 18	„ 20	May 23	Confluent	D.	May 31	May 18	4 vesicles	—	———	968
1795	3286 H. W.	M.	6	„ 23	„ 18	„ 20	„ 23	Confluent	Rec.	—	„ 18	3 vesicles	—	———	968
1796	3287 E. O.	F.	36	„ 23	„ 17	„ 20	—	Mild	„	—	Inf.	—	—	———	996
1797	3288 E. J. T.	F.	31	„ 23	„ 14	„ 16	—	Confluent	„	—	Inf.	2	—	———	886
1798	3289 M. R.	F.	25	„ 23	„ 21	„ 23	—	Mild	„	—	Inf.	—	—	———	927
1799	3290 W. C. H.	M.	54	„ 24	„ 20	„ 23	—	Coherent	„	—	Inf.	4 plain	—	———	1003
1800	3291 R. B.	M.	38	„ 24	„ 21	„ 23	May 24	Confluent	D.	May 29	Inf. (alleged)	No marks	—	With hæmorrhage	1004
1801	3292 F. P.	F.	33	„ 24	„ 21	„ 23	—	Discrete	Rec.	—	Inf.	—	—	———	950
1802	3314 A. J. W.	M.	3	„ 29	„ 27	„ 28	—	Confluent	„	—	Unvaccinated		—	———	1009
1803	3295 C. T.	M.	18	„ 25	„ 23	„ 25	May 26	Discrete	„	—	Inf.	3 foveate	—	———	965
1804	3296 J. T.	M.	9/12	„ 25	„ 23	„ 25	„ 26	Confluent	D.	May 28	Unvaccinated		—	———	965
1805	3297 F. G. T.	M.	3	„ 25	„ 22	„ 23	—	Malignant	D.	„ 26	Unvaccinated		—	"Pyæmia," hæmorrhage.	965
1806	— L. C.	F.	22	—	—	About May 25	—	Mild (inoculated).	Rec.	—	Inf.	—	6 weeks (2)	Inoculated by Mrs. S. (No. 1674) whom she was nursing. 2 pustules, on cheek.	932
1807	3298 S. T.	M.	7	May 26	May 24	May 26	May 26	Coherent	„	—	Unvaccinated		—	———	965
1808	3299 F. O.	F.	3	„ 26	„ 21	„ 24	—	Confluent	D.	June 5	Unvaccinated		—	———	996
1809	3300 R. B.	M.	23	„ 26	„ 21	„ 25	—	Discrete	Rec.	—	Inf.	—	Twice in last 6 weeks, no result.	———	1006

1810	3301	P. H.	F.	50	„	26	„	22	„	26	—	Discrete	„	—	Inf.	—	—	—	955
1811	3370	W. R.	M.	3	„	30	„	30	June	1	—	Confluent	D.	June 2	Unvaccinated		—	—	964
1812	3304	E. T.	F.	3	„	27	„	23	May	27	—	Confluent	D.	May 31	Unvaccinated		—	—	964
1813	3306	C. C.	M.	43	„	27	„	26	„	27	—	Confluent	Rec.	—	Inf.	—	—	—	1007
1814	3315	C. G.	F.	28	„	29	„	25	„	27	May 30	Confluent	D.	May 31	Inf.	No marks	—	—	1010
1815	3316	M. A. S.	F.	35	„	29	„	25	„	26	—	Discrete	Rec.	—	Inf.	—	—	—	1011
1816	3318	G. H. H.	M.	29	„	29	„	28	„	29	—	Coherent	„	—	Inf.	—	—	—	1012
1817	3307	A. B.	F.	5	„	28	„	25	„	27	May 28	Coherent	„	—	Unvaccinated		—	—	977
1818	3308	E. P.	F.	12	„	28	„	24	„	25	—	Mild	„	—	Inf.	3 (2 foveate).	—	—	855
1819	3309	W. G.	M.	6	„	28	„	14	„	16	—	Confluent	„	—	Unvaccinated		—	—	929
1820	3310	S. G.	M.	5	„	28	„	17	„	21	—	Confluent	D.	June 4	Unvaccinated		—	With hæmorrhage	929
1821	3311	W. H. S.	M.	11/12	„	28	„	26	„	27	—	Confluent	Rec.	—	Unvaccinated		—	A severe case, infant sister (No. 1695) recently vaccinated, died.	690
1822	3317	W. H.	M.	1/12	„	29	„	28	„	29	—	Confluent	„	—	Unvaccinated		—	—	963
1823	3319	J. J.	M.	34	„	30	„	24	„	27	—	Discrete	„	—	Inf.	—	—	—	1013
1824	3327	C. H.	M.	14	„	30	„	23	„	25	—	Discrete	„	—	Inf.	2 fair	2 months since, no scar.	States that one of re-vaccination sites "rose a little," and there were enlarged axillary glands.	1014
1825	3331	P. C.	M.	12	„	30	„	26	„	28	—	Confluent	D.	June 24	Unvaccinated		—	—	1015
1826	3332	J. A. S.	M.	39	„	30	„	26	„	30	—	Discrete	Rec.	—	Inf.	—	—	—	1016
1827	3333	W. S.	M.	25	„	30	„	28	„	30	May 31	Mild	„	—	Inf.	2 faint	May 20, nil	—	1017
1828	3335	G. F.	M.	27	„	30	„	29	„	30	—	Confluent	„	—	Inf.	—	—	Said to have had small-pox in childhood: intemperate; much œdema of face.	1018
1829	3336	F. L.	M.	34	„	30	„	28	„	30	May 31	Discrete	„	—	Inf.	3 plain	—	—	1019
1830	3337	E. N.	F.	22	„	30	„	20	„	23	—	Mild	„	—	Inf.	—	3 weeks ago, nil.	—	1020
1831	3346	D. C.	F.	4	„	30	„	24	„	26	—	Confluent	D.	June 2	May 19	3 vesicles	—	—	1021
1832	3345	E. C.	F.	6	—		„	24	„	26	—	Coherent	Rec.	—	„ 19	3 vesicles	—	—	1021
1833	3347	L. C.	F.	9/12	—		„	24	„	26	—	Coherent	„	—	Unvaccinated		—	—	1021
1834	3351	M. B.	F.	50	May	31	„	26	„	29	—	Confluent	D.	June 6	Inf.	—	—	—	1022
1835	3352	C. T. H.	M.	3	„	31	„	26	„	29	—	Discrete	Rec.	—	Unvaccinated		—	—	1023
1836	3353	J. T. M.	M.	15	„	31	„	25	„	26	—	Discrete	„	—	Inf.	4 foveate	—	—	1024
1837	3354	E. M.	F.	50	„	31	„	24	„	29	—	Mild	„	—	Inf.	—	—	—	1025
1838	3355	J. D.	F.	32	„	31	„	24	„	28	—	Confluent	„	—	Inf.	—	—	—	1026
1839	3338	E. A. H.	F.	37	„	30	—		—		—	Mild	„	—	Inf.	—	—	—	969
1840	3334	F. M.	M.	3	„	30	May	28	May	30	—	Coherent	„	—	Unvaccinated		—	—	971
1841	3356	E. G.	F.	27	June	1	„	25	„	29	—	Coherent	„	—	Inf.	—	Aged 14	—	1028
1842	3357	E. A. L.	F.	33	„	1	„	28	„	30	—	Discrete	„	—	Inf.	—	4 years ago, 4 attempts, no result.	—	1029
1843	3358	W. F. W.	M.	36	„	1	„	29	„	31	June 1	Coherent	„	—	Inf.	2 large	—	Solid infiltration	1030
1844	3359	M. M.	F.	45	„	1	„	28	„	30	„ 1	Confluent	D.	June 20	Unvaccinated		—	—	1031
1845	3360	M. H.	F.	3	„	1	„	27	„	31	„ 3	Confluent	Rec.	—	Unvaccinated		—	—	81
1846	3361	H. P.	M.	47	„	1	„	27	„	30	—	Mild	„	—	Inf.	—	—	14 days after return of son (No. 779) from hospital.	447
1847	3362	S. T.	F.	74	„	1	„	29	„	31	—	Confluent	„	—	Aged 12	—	—	Was living at Harpney, near Gloucester, when vaccinated; small-pox then prevalent. Arm was "bad," and she was said to have had "cow-pox and small-pox."	1032
1848	3363	A. B.	F.	23	„	1	„	27	„	31	—	Mild	„	—	Inf.	—	—	—	1033

No.	Name and Notification Number.	Sex.	Age.	Date of Notification.	Date of Onset.	Date of Rash.	Date of Removal to Hospital.	Type of Attack.	Result.	Date of Death.	Vaccination. Date.	Vaccination. No. of Marks.	Re-vaccination Date.	Remarks.	No. in House Register.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
				1896.											
1849	3364 T. J.	M.	28	June 1	May 29	May 30	—	Confluent	Rec.	—	Inf.	4 plain	—	——	1034
1850	3365 L. E. S.	F.	23	„ 1	„ 29	„ 31	—	Confluent	„	—	Inf.	—	—	——	1035
1851	3367 E. A. F.	F.	11	„ 2	„ 28	„ 30	June 1	Confluent	„	—	Inf.	1 very faint	—	——	1036
1852	3368 E. B.	M.	13	„ 2	„ 30	June 2	—	Mild	„	—	Inf.	4 foveate	—	——	1037
1853	3369 H. G.	M.	16	„ 2	„ 31	„ 1	—	Coherent	„	—	Inf.	4 small	—	——	1038
1854	3371 M. S.	F.	26	„ 2	„ 28	May 31	—	Coherent	„	—	Inf.	—	—	——	1039
1855	3372 L. H.	F.	13	„ 2	„ 31	June 2	June 3	Mild	„	—	Inf.	4 foveate	—	——	1040
1856	3373 C. M. W.	F.	55	„ 2	„ 27	May 29	—	Discrete	„	—	Inf.	—	—	——	1041
1857	3375 A. C.	F.	8	„ 2	„ 31	June 2	—	Confluent	„	—	Unvaccinated		—	——	904
1858	3376 J. C.	F.	5	„ 2	„ 31	„ 2	—	Confluent	„	—	Unvaccinated		—	——	904
1859	3377 G. F.	M.	35	„ 2	„ 30	„ 1	—	Mild	„	—	Inf.	4(2foveate)	—	——	1042
1860	3379 E. A. B.	F.	7	„ 2	„ 29	May 31	June 3	Confluent	„	—	Unvaccinated		—	——	1043
1861	3444 W. G.	M.	25	„ 17	—	—	—	Discrete	„	—	Inf.	4 foveate	—	——	1038
1862	3380 E. L.	F.	57	„ 3	May 27	June 1	—	Discrete	„	—	Inf.	—	—	——	1044
1863	3381 W. D.	M.	23	„ 3	„ 29	May 31	June 3	Discrete; abortive.	„	—	Inf.	4 foveate	4 months ago, unsuccessful.	——	1045
1864	3382 R. M.	M.	73	„ 3	„ 31	June 2	„ 3	Coherent	„	—	Inf. (alleged)	2 doubtful	—	Paralysis agitans	1046
1865	3384 J. H.	M.	38	„ 3	„ 28	„ 2	—	Discrete	„	—	Inf.	—	—	——	1047
1866	3385 E. J.	F.	28	„ 3	„ 31	„ 3	—	Discrete	„	—	Inf.	—	—	Large pustules	1048
1867	3387 G. G. E.	M.	4	„ 3	„ 29	May 31	—	Confluent	D.	June 13	Unvaccinated		—	——	987
1868	3391 H. D.	M.	8	„ 3	„ 30	June 1	—	Confluent	D.	„ 12	Unvaccinated		—	——	992
1869	3392 A. G.	F.	20	„ 3	„ 27	May 30	—	Coherent	Rec.	—	Inf.	4 small scars.	—	——	1049
1870	3393 H. B.	F.	28	„ 3	„ 29	June 1	—	Mild	„	—	Inf.	—	—	Inoculated on nose by her child (No. 1756). General rash followed 7 days later.	985
1871	3394 D. T.	F.	8	„ 3	„ 31	„ 2	—	Discrete	„	—	Unvaccinated		Attempted in March 1896.	Large pustules. 5 linear streaks remain at vaccinal site.	937
1872	3395 E. C.	F.	21	„ 3	„ 28	„ 2	—	Coherent	„	—	Inf.	—	—	——	1050
1873	— B. B.	F.	21	—	?	?	—	Discrete	„	—	Inf.	—	2 months ago	Employed in nursing Mrs. H., No. 1703.	963
1874	3398 C. W.	M.	2/12	June 4	June 1	June 1	—	Confluent	D.	June 13	Unvaccinated		—	Six weeks ago, failure at vaccination.	1051
1875	3399 M. C.	F.	5/12	„ 4	„ 1	„ 3	June 5	Confluent	D.	„ 14	Unvaccinated		—	Hæmorrhage into few pocks	957
1876	3400 A. T.	F.	39	„ 4	„ 1	„ 3	—	Mild	Rec.	—	Inf.	3 faint	2 months ago; no result; only 2 small red marks.	——	999
1877	3401 A. R.	M.	26	„ 5	„ 1	„ 4	—	Discrete	„	—	Inf.	—	—	——	964
1878	3403 W. C. M.	M.	40	„ 5	„ 3	„ 5	June 5	Discrete	„	—	Inf.	1 foveate	—	——	732
1879	3404 A. M.	M.	1	„ 5	„ 3	„ 5	„ 5	Confluent	D.	June 8	Unvaccinated		—	——	1031
1880	3405 M. A. F.	F.	50	„ 5	„ 1	„ 3	„ 6	Mild	Rec.	—	Aged 10	3 faint	—	——	1052
1881	3406 E. T.	F.	38	„ 5	„ 2	„ 3	—	Confluent	„	—	Inf.	—	—	——	1053

1882	3407	P. G.	F.	54	„ 5	„ 3	„ 5	—	Mild	„	—	Inf.	—	—	Advanced heart disease. Daughter (No. 1869) engaged in visiting and bathing cases.	1049
1883	3408	L. G.	F.	10	„ 5	„ 3	„ 5	—	Mild	„	—	Inf.	4 foveate	—	———	1049
1884	3409	M. M.	F.	35	„ 6	„ 2	„ 4	—	Mild	„	—	Inf.	—	—	———	1054
1885	3410	J. C.	M.	31	„ 6	May 30	„ 2	—	Discrete	„	—	Inf.	—	—	———	1055
1886	3411	W. B.	M.	45	„ 6	June 2	„ 3	—	Coherent	„	—	Inf.	—	—	Employed in driving cab in service of Mr. P. Had himself visited a case (No. 1789) and assisted the bathing.	1056
1887	3412	A. B.	M.	26	„ 6	„ 2	„ 4	June 6	Mild	„	—	Inf.	2 faint	—	———	1057
1888	3413	A. E. G.	M.	23	„ 6	„ 1	„ 5	—	Discrete	„	—	Inf.	—	—	———	1058
1889	3414	W. D.	M.	20	„ 6	„ 2	„ 5	—	Discrete	„	—	Inf.	2 scars	—	———	634
1890	3415	F. P.	F.	63	„ 6	„ 2	„ 4	—	Discrete	„	—	Inf.	—	—	———	1059
1891	3416	G. R.	M.	37	„ 7	„ 3	„ 6	—	Coherent	„	—	Inf.	—	—	———	1060
1892	3417	T. P.	M.	38	„ 7	„ 1	„ 3	June 8	Confluent	„	—	Inf.	2 good	14 years ago (1 place).	Some hæmorrhage into pocks.	1061
1893	3418	F. B.	F.	40	„ 8	„ 5	„ 8	—	Malignant	D.	June 9	Inf.	—	—	Wife to No. 1800; removed to another house.	1062
1894	—	W. A.	M.	22	—	„ 2	„ 3	—	Mild	Rec.	—	Inf.	—	—	———	1063
1895	3419	G. S.	F.	9	June 9	„ 7	„ 9	—	Confluent	„	—	Unvaccinated		—	———	1064
1896	3420	S. F. L.	M.	7	„ 9	„ 7	„ 9	June 10	Discrete	„	—	Inf.	2(1 foveate)	—	A fairly typical foveate scar below elbow of right arm (the vaccination marks being in usual site). Mother states he was vaccinated in two places only, and that this lower scar was due to a scald at 2 months old, ? Inoculated from vaccine vesicles.	1065
1897	3421	W. C. S.	M.	7	„ 10	„ 9	„ 10	—	Confluent	D.	June 23	Unvaccinated		—	———	1064
1898	—	S. E. S.	F.	3	—	May 24	May 26	—	Confluent	D.	„ 2	Unvaccinated		—	———	1064
1899	3422	E. D. H.	F.	6	June 10	June 3	June 6	—	Coherent	Rec.	—	Unvaccinated		—	———	1046
1900	3423	M. L.	F.	5	„ 10	„ 6	„ 8	—	Malignant	D.	June 15	Unvaccinated		—	———	1066
1901	3424	A. McH.	F.	35	„ 10	„ 7	„ 9	—	Malignant	D.	„ 11	Unvaccinated		—	———	1067
1902	3425	E. D.	F.	38	„ 10	„ 3	„ 6	—	Coherent	Rec.	—	Inf.	—	—	———	973
1903	3426	F. C.	M.	43	„ 10	„ 8	„ 10	—	Mild	„	—	Inf.	2(1 foveate)	—	———	814
1904	3427	E. B.	F.	26	„ 10	„ 7	„ 10	—	Coherent	„	—	Inf.	—	—	———	1068
1905	2428	S. W.	F.	20	„ 11	„ 9	„ 10	—	Discrete	„	—	Inf.	—	—	Inoculated on chin from No. 1802.	1009
1906	—	H. T. S.	M.	4	—	May 26	May 26	—	Confluent	D.	June 10	Unvaccinated		—	———	1064
1907	—	E. A. S.	F.	13	—	„ 26	„ 26	—	Mild	Rec.	—	Inf.	2 (1 large, 1 small smooth).	—	———	1064
1908	—	T. J. S.	M.	39	—	—	June 9	—	Mild	„	—	Inf.	—	—	———	1064
1909	—	S. J. S.	F.	40	—	June 4	„ 6	—	Mild	„	—	Inf.	—	—	Inoculated on left lower eyelid	1064
1910	—	C. H. D.	M.	37	—	May 29	May 29	—	Mild	„	—	Inf.	—	—	Inoculated on finger, May 22, when attending child, No. 1767.	992
1911	3429	H. M.	M.	44	June 12	June 8	June 11	June 12	Coherent	„	—	Inf.	5 foveate	—	———	1069
1912	3430	M. S.	F.	11/12	„ 12	„ 9	„ 11	„ 13	Coherent	„	—	Unvaccinated		—	———	1064
1913	3431	L. W.	F.	13	„ 12	„ 9	„ 12	„ 13	Discrete	„	—	Inf.	4 slight foveate.	—	———	678
1914	3433	E. F.	F.	43	„ 12	„ 7	„ 10	„ 12	Mild	„	—	Inf.	2(1 foveate)	—	———	1070

No.	Name and Notification Number.	Sex.	Age.	Date of Notification.	Date of Onset.	Date of Rash.	Date of Removal to Hospital.	Type of Attack.	Result.	Date of Death.	Vaccination. Date.	Vaccination. No. of Marks.	Re-vaccination Date.	Remarks.	No. in House Register.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
				1896.											
1915	3436 M. F.	F.	34	June 13	June 10	June 12	June 14	Discrete	—	—	Inf.	2 foveate	—	Her infant, 13 days old, accompanied her to hospital. It was vaccinated on day of birth, and presented 4 large scabs with areola. It did not contract small-pox.	1036
1916	3435 C. C. M.	M.	22	„ 13	„ 8	„ 11	—	Coherent	—	—	Inf.	4 foveate	—	———	1025
1917	3439 W. H. A.	M.	30	„ 15	„ 8	„ 12	June 15	Mild	—	—	Inf.	2 smooth	—	———	1071
1918	3440 C. J. B.	M.	22	„ 15	„ 12	„ 14	„ 20	Discrete	—	—	Inf.	3 foveate	—	———	1072
1919	3442 L. M. P.	F.	13	„ 16	„ 11	„ 13	„ 16	Mild	—	—	Inf.	3 (2 foveate, 1 scar, large).	—	———	447
1920	3443 F. D.	M.	22	„ 16	„ 11	„ 13	—	Discrete	—	—	Inf.	3 large	—	———	1026
1921	3445 A. S.	F.	29	„ 17	„ 13	„ 15	June 17	Coherent	—	—	Inf.	3 plain	—	Psoriasis since aged 12	1073
1922	3446 L. H.	F.	11	„ 17	„ 17	„ 19	—	Discrete	—	—	Inf.	3 plain	—	Fine papules; rather profuse on face and wrist.	1023
1923	3447 W. H. K.	M.	13	„ 17	„ 16	„ 17	June 17	Discrete	—	—	Inf.	3 foveate	—	———	1074
1924	3450 W. C.	M.	17	„ 18	„ 14	„ 16	„ 18	Discrete	—	—	Inf.	3 foveate	—	Pustules of various sizes	1075
1925	3451 E. F.	F.	32	„ 19	„ 16	„ 18	„ 18	Discrete	—	—	Inf.	Indistinct	—	———	1042
1926	3454 A. W. T.	F.	6	„ 19	„ 17	„ 17	—	Coherent	—	—	Unvaccinated		—	———	1076
1927	2455 M. D.	F.	19	„ 19	„ 13	„ 14	June 19	Discrete	—	—	Inf.	3 foveate	6 weeks ago, not successful.	A few minute red papules at re-vaccination site.	1077
1928	3456 R. W. H.	M.	8	„ 19	„ 15	„ 18	„ 23	Discrete	—	—	Unvaccinated		—	———	1046
1929	— A. M. S.	F.	31	—	May 15	May 19	—	Mild	—	—	Inf.	—	20 years ago	A doubtful case. No trace of eruption when seen on June 20. Case not notified. Had pod-romata.	249
1930	3458 E. H.	M.	24	June 20	June 17	June 19	June 20	Discrete	—	—	Inf.	1 foveate	—	———	1079
1931	3457 H. F.	M.	3	„ 20	„ 17	„ 19	„ 20	Coherent	—	—	Unvaccinated		—	———	1080
1932	3460 E. C.	F.	41	„ 21	—	—	—	Mild	—	—	Inf.	—	—	———	1081
1933	3461 H. S.	F.	48	„ 22	—	—	—	Discrete	—	—	Inf.	4	—	———	1082
1934	3462 S. J.	F.	11	„ 22	June 19	June 21	—	Coherent	—	—	Aged 2	4 foveate	—	Papules of various sizes	1083
1935	3463 F. J. H.	M.	4	„ 22	„ 20	„ 22	—	Confluent	—	—	Unvaccinated		—	———	1046
1936	3464 S. J.	M.	26	„ 22	„ 19	„ 21	—	Discrete	—	—	Inf.	—	—	———	1084
1937	3466 A. G. H.	M.	11	„ 24	„ 20	„ 22	June 23	Confluent	—	—	Unvaccinated		—	———	1046
1938	3467 W. T.	M.	9	„ 24	„ 19	„ 21	—	Confluent	—	—	Unvaccinated		—	———	937
1939	3468 W. L. G.	M.	14	„ 24	—	—	—	Discrete	—	—	Inf.	1 foveate	—	———	1085
1940	3475 L. M. H.	M.	4/12	„ 27	June 21	June 24	—	Confluent	D.	July 4	Unvaccinated		—	Convulsions, June 23. Some hæmorrhage into skin.	1046
1941	3471 M. A. F.	F.	60	„ 25	„ 23	„ 26	June 27	Mild	—	—	Inf.	3 foveate	20 years ago, no result.	———	1086
1942	3472 F. H.	F.	15	„ 25	„ 24	„ 26	„ 27	Discrete	—	—	Inf.	4 foveate	—	———	1087
1943	3473 E. P.	F.	25	„ 25	„ 21	„ 24	—	Discrete	—	—	Inf.	—	—	———	1088
1944	3474 A. J. H.	M.	42	„ 26	„ 23	„ 25	—	Discrete	—	—	Inf.	—	—	———	1089

1945	3477	W. E. B.	M.	19	„ 27	„ 25	„ 27	June 28	Discrete	—	—	Inf.	4 foveate	—	——	1043
1946	3343	W. E. C.	M.	8	—	May 5	May 7	—	Coherent	—	—	Unvaccinated		—	——	1021
1947	3342	T. G. C.	M.	17	—	About May 20		—	Mild	—	—	Inf.	—	—	——	1021
1948	3344	E. J. C.	M.	11	—			—	Mild	—	—	Inf.	—	—	——	1021
1949	3478	M. C.	F.	25	June 27	June 22	June 26	—	Discrete	—	—	Inf.	4 foveate	—	——	1090
1950	3479	A. L.	M.	24	„ 27	„ 22	„ 24	—	Confluent	—	—	Inf.	—	—	——	1091
1951	3480	A. V.	F.	32	„ 27	„ 24	„ 26	June 28	Confluent	D.	July 12	Unvaccinated		—	Infantile vaccination failed	1092
1952	3481	R. C.	M.	19	„ 28	„ 23	„ 26	—	Discrete	—	—	Inf.	4	—	——	1093
1953	3484	J. M.	M.	60	„ 29	„ 26	„ 28	June 29	Confluent	D.	July 2	Inf.	—	—	——	850
1954	—	J. B.	M.	25	—	May 7	May 9	—	Discrete	—	—	Inf.	—	—	——	1094
1955	—	F. H.	F.	29	—	„ 5	„ 7	—	Mild	—	—	Inf.	—	—	A doubtful case	1095
1956	—	G. J.	M.	30	—	„ 5	„ 7	—	Mild	—	—	Inf.	—	—	See Nos. 155, 283	108
1957	—	T. R.	M.	37	—	Apr. 21	Apr. 23	—	Mild	—	—	Inf.	—	—	Father of No. 1056	599
1958	—	J. M.	F.	5	—	May 12	?	—	Mild ?	—	—	Inf.	1 foveate	—	A doubtful case. When seen by me, on June 28, no trace of eruption visible.	393
1959	3483	W. P.	M.	28	June 29	June 25	June 27	June 29	Confluent	—	—	Inf.	4 foveate	—	——	1096
1960	3485	L. F.	F.	42	„ 29	„ 26	„ 28	—	Coherent	—	—	Inf.	3 faint	—	Large full pustules	1097
1961	3486	F. A. R.	F.	6	„ 29	„ 25	„ 27	—	Coherent	—	—	Unvaccinated		—	Large pustules. Vaccination attempted two months ago, but failed, only linear scratches visible.	1098
1962	3487	E. F.	F.	50	„ 30	„ 22	„ 24	—	Discrete	—	—	Inf.	—	—	Large pustules	1078
1963	3490	H. M.	M.	14	„ 30	„ 28	„ 30	—	Mild	—	—	Inf.	4 foveate	End of March	One slight scar	1025
1964	3491	A. W.	M.	45	July 1	„ 23	„ 25	—	Mild	—	—	Inf.	4 foveate, small.	Attempted 2 months ago, failed.	A small linear scar at site of attempted re-vaccination.	1099
1965	3492	A. T.	F.	42	„ 1	„ 28	„ 29	—	Mild	—	—	Inf.	3 foveate	20 years ago; no result.	——	1100
1966	3493	J. M.	M.	4	„ 1	„ 30	July 1	July 2	Coherent	—	—	Unvaccinated		—	Fine multiform rash	1101
1967	3494	M. D.	F.	45	„ 3	„ 29	„ 1	„ 2	Mild	—	—	Aged 8	3 marks	—	Mother of No. 1930	1077
1968	3495	A. F.	F.	19	„ 3	July 1	„ 2	„ 3	Confluent	—	—	Inf.	4 very faint.	—	——	1101
1969	3496	M. A. M.	F.	46	„ 3	„ 1	„ 2	„ 3	Confluent	D.	July 8	Unvaccinated		—	Delirium	1068
1970	3498	W. T. S.	M.	28	„ 7	—	—	—	Mild	—	—	Inf.	2 large scarred.	—	——	1102
1971	3502	E. W.	F.	22	„ 11	July 9	July 10	July 11	Mild	—	—	Inf.	1 foveate	—	——	850
1972	3506	A. L.	F.	56	„ 14	—	—	—	Mild	—	—	Inf.	—	—	——	1091
1973	3510	A. H.	F.	38	„ 15	July 11	July 14	July 15	Mild	—	—	Inf.	3 scars	—	——	1103
1974	3512	H. H.	M.	26	„ 15	„ 13	„ 15	„ 15	Discrete	—	—	Inf.	4 foveate	—	——	1104
1975	3514	H. H.	M.	28	„ 17	„ 12	„ 15	„ 17	Malignant	D.	July 21	Inf.	2 scars	—	——	1105
1976	3277	E. M.	F.	5/12	May 21	May 19	„ 21	—	Discrete	—	—	Unvaccinated		—	Child of No. 1778 and notified on same day; omitted in error.	998
1977	1463	F. P.	M.	50	Jan. 23	?	?	Jan. 23	Mild	—	—	Inf.	—	—	Notified from Ship "Hero." Father of Nos. 60 and 84; omitted above in error.	41
1978	3516	H. M.	F.	60	July 18	July 13	July 15	„ 18	Coherent	—	—	Inf.	4 faint	—	——	850
1979	3517	S. A. P.	F.	64	„ 20	„ 16	„ 18	„ 20	Confluent	D.	July 24	Inf.	—	—	——	1099

§ 10. School Influence as a Factor in the Spread of the Disease.

The remarkable outburst of the small-pox in the month of February was, as has already been intimated, due to the fact that two of the largest public elementary schools in Gloucester became centres of infection, viz., the Widden Street Board School and St. Luke's School in New Street. Situated in opposite quarters of the town, where cases of small-pox had already occurred, the dissemination of the disease in these neighbourhoods, through the medium of the school children, became at once strikingly manifested.

Widden Street Board School.

This school is situated between Widden Street, Napier Street, and Sinope Street, at the northern boundary of the south hamlet. At the beginning of the year there were on the books: boys, 276; girls, 276; infants, 242.

During 1895 five of the children attending this school had been attacked with small-pox, but there is no ground for believing that they were infected in the school. They are: boys (No. 34), girls (Nos. 8, 25), infants (Nos. 10, 35).

The school was closed by order of the Sanitary Authority on February 21st, there having been notified several cases of small-pox amongst the children attending the infant school. From the commencement of the year until the 7th of March, these notifications (of children the first to be attacked in their respective families) numbered as follows, on the days given :—

February 15	-	1	February 19	-	8	February 25	-	1
„ 16	-	3	„ 20	-	6	March 7	-	1
„ 17	-	7	„ 21	-	8	April 4	-	1
„ 18	-	4	„ 22	-	5	1 not notified (No. 222).		

All of these were in the infant school.

Cases of Small-Pox amongst Children attending the Widden Street Board School (Infants), notified between February 13th and March 7th, 1896.

Reference No.	Name.	Age.	Notification.	Onset.	Last Day of School Attendance.	Result.	Other Cases in House.	Reference to House List.
102	R. P.	5	Feb. 13	Feb. 11	Jan. 31	D.	Nos. 78, 108, 127 -	47
107	A. H.	5	„ 15	„ 12	?	—	——	70
112	W. H.	3	„ 16	„ 14	?	D.	——	74
113	A. S.	6	„ 16	„ 13	Feb. 12	D.	——	75
116	F. M.	5	„ 16	„ 14	?	D.	No. 238 - - -	77
117	W. E.	4	„ 17	„ 14	„ 12	—	No. 224 - -	78
119	L. D.	5	„ 17	„ 15	„ 13	—	——	80
120	A. H.	5	„ 17	„ 15	„ 12	D.	No. 1,845 - - -	81
121	W. H. A.	5	„ 17	„ 14	„ 12	—	No. 232 - - -	82
122	A. T.	5	„ 17	„ 14	„ 14	—	Nos. 216, 217 - -	83
123	A. O.	6	„ 17	„ 15	„ 13	—	——	84
124	W. C.	5	„ 17	„ 14	„ 13	D.	——	85
125	G. J.	6	„ 18	„ 14	„ 13	—	——	86
128	R. J.	7	„ 18	„ 13	„ 14	—	Nos. 647, 1,128 - -	87
129	L. J.	5	„ 18	„ 13	„ 14	—		87
130	C. M.	6	„ 18	„ 14	„ 14	—	——	88
132	C. L.	5	„ 19	„ 17	?	D.	No. 267 - - -	90
131	A. N.	6	„ 19	„ 14	„ 14	—	No. 247 - -	89
133	O. N.	3	„ 19	„ 14	„ 14	—		89
134	E. C.	5	„ 19	„ 17	„ 13	D.	——	91
135	F. B.	6	„ 19	„ 16	„ 13	D.	Nos. 234, 235, 236, 259, 260, 265, 266, 268, 314, 429.	94
138	W. W.	5	„ 19	„ 16	„ 14	—	——	95
139	A. A.	4	„ 19	„ 17	„ 14	D.	Nos. 230, 567, 991, 993 -	96
142	E. B.	6	„ 19	„ 8	„ 16	—	No. 341 - - -	97
144	B. S.	5	„ 20	„ 14	„ 14	—	Nos. 241, 242, 257, 258 -	98
145	S. A.	5	„ 20	„ 18	„ 13	—	Nos. 245, 246, 351 -	99
146	W. K.	5	„ 20	„ 15	„ 12	D.	——	100
148	C. T.	5	„ 20	„ 16	?	—	No. 1,214 - -	102
151	G. B.	5	„ 20	„ 18	?	D.	No. 152 - - -	105
153	J. H.	3	„ 20	„ 14	„ 14	D.	Nos. 274, 284 - -	106
155	J. J.	5	„ 21	„ 17	„ 17	D.	Nos. 283, 1,956 - -	108
156	V. E. H.	7	„ 21	„ 16	„ 7	D.	Nos. 255, 256 - -	109

Reference No.	Name.	Age.	Notification.	Onset.	Last Day of School Attendance.	Result.	Other Cases in House.	Reference to House List.
157	A. C.	6	Feb. 21	Feb. 14	Feb. 14	—	No. 303 - - -	110
158	E. B.	6	„ 21	„ 14	„ 14	—	——	111
159	W. R. T.	5	„ 21	„ 17	„ 17	D.	Nos. 291, 466, 479, 643, 644.	113
161	M. H.	6	„ 21	„ 19	„ 19	D.	——	114
162	A. G.	5	„ 21	„ 18	?	D.	——	115
163	V. M.	4	„ 21	„ 17	„ 17	—	Nos. 575, 576, 737 -	116
164	D. P.	5	„ 22	„ 16	„ 14	—	Nos. 243, 582, 583 -	117
165	R. P.	5	„ 22	„ 18	„ 17	—	Nos. 414, 415 - -	118
166	W. R.	5	„ 22	„ 17	„ 14	D.	Nos. 286, 584 - -	119
167	W. A.	5	„ 22	„ 17	„ 17	—	No. 278 - - -	120
171	H. S.	5	„ 22	„ 18	„ 18	—	Nos. 440, 747, 873, 874 -	123
183	T. R.	6	„ 25	„ 19	„ 20	—	Nos. 591, 836 - -	131
222	W. C.	4	—	„ 14	„ 19	D.	No. 221 - - -	163
293	W. G.	6	Mar. 7	„ 5	?	—	——	198
839	M. L.	6	April 4	Mar. 6	„ 14	—	No. 838 - -	472

Thus 47 children attending the infant school at Widden Street were attacked with small-pox from the second week in February to the first week in March; the greater number of cases being notified from the 16th to the 22nd (inclusive) viz., 41. In 46 instances the child was the first member of its family to be attacked. The exception to this is the child who heads the list, who last attended the school on January 31st, the day on which her mother (No. 78) was declared to be suffering from small-pox. It is quite possible that it was through this child that the disease was introduced into the school. She died, and so did no fewer than 19 out of the 46 attacked subsequently. The case mortality amongst the children in this infant school was, therefore, 44·4 per cent. In the 44 households to which these children (except (No. 102) belonged, 65 cases of small-pox subsequently arose, in two instances, viz., Houses 81 and 102, after a long interval—so long as to raise doubts whether the later case was directly connected with the initial one. It may be remarked that the 111 cases of small-pox thereby accounted for were thus distributed:—

In 15 houses, 1 case - 15	Initial, 15 - 7 deaths.				
12 „ 2 cases - 24	„ 12 - 5 „	Later, 12 - 2 deaths.			
8 „ 3 „ - 24	„ 9 - 4 „	„ 15 - 5 „			
4 „ 4 „ - 16	„ 5 - 0 „	„ 11 - 0 „			
3 „ 5 „ - 15	„ 3 - 1 „	„ 12 - 1 „			
1 „ 6 „ - 6	„ 1 - 1 „	„ 5 - 2 „			
1 „ 11 „ - 11	„ 1 - 1 „	„ 10 - 3 „			
44	111	46 - 19		65 - 13	

It will be observed that the mortality amongst the "later" cases in the houses infected by these school children was 19·3 per cent., whereas amongst the children themselves it was 44·4 per cent. This may be compared with the age-incidence of the disease in these households.

Age.	Initial.		Later.		Total.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Under 1 year - - -	—	—	3	3	3	3
1 to 10 years - - -	46	19	24	6	70	25
10 to 30 „ - - -	—	—	24	1	24	1
30 and over - - -	—	—	14	3	14	3
	46	19	65	13	111	32

All the children attacked were unvaccinated, and the vaccination conditions of the 65 persons subsequently falling ill in the houses whence they came was as follows :—

Age.	Vaccinated.		Unvaccinated.		"Under" Vaccination.		"Alleged" Vaccination.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Under 1 year - -	—	—	3	3	—	—	—	—
1 to 10 years - -	—	—	24	6	1	—	—	—
10 to 30 „ - -	22	—	—	—	—	—	1	—
30 and over - -	12	3	1	1	—	—	1	—
	34	3	28	10	1	—	2	—

One of the teachers (L. W., No. 110) in the infant school contracted small-pox at the same time as the children, her case being notified on February 16.

Of the teachers, those in the boys' school were re-vaccinated when it was closed, except one, who had been re-vaccinated in January; in the girls' school, seven re-vaccinated in January, four while the school was closed; in the infants' school, six re-vaccinated in January, two in February. The teacher attacked with small-pox had not been re-vaccinated.

St. Luke's School (New Street).

This school is situated at the western extremity of New Street, in which there had been two houses invaded by small-pox in January. This street was destined to be one of the chief foci of the disease, and the school children were doubtless largely the source whereby it was infected.

None of the teachers in this school were attacked with small-pox.

CASES of SMALL-POX amongst Children attending St. Luke's School (New Street) notified between February 24th and March 16th, 1896.

Reference No.	Name.	Age.	Notification.	Onset.	Last Day of School Attendance.	Result.	Other Cases in House.	Reference to House List.
				BOYS.				
289	F. M.	12	Mar. 7	Mar. 1	Feb. 28	—	Nos. 534, 624, 665, 666 -	195
359	H. H.	6	„ 11	„ 8	„ 28	—	Nos. 729, 786 - -	237
396	H. D.	8	„ 13	„ 7	„ 28	—	Nos. 716, 718, 719 -	266
444	T. B.	11	„ 15	„ 13	„ 28	—	Nos. 728, 731 - -	293
				GIRLS.				
366	L. T.	8	Mar. 11	Mar. 7	Feb. 28	—	No. 662 - -	242
455	M. G.	6	„ 16	„ 14	„ 28	—	Nos. 454, 456, 457 -	299
				INFANTS.				
174	L. K.	5	Feb. 24	Feb. 19	Feb. 20	D.	Nos. 820, 827, 1142, 1247	125
176	C. W.	5	„ 24	„ 19	„ 20	D.	——	126
178	W. H.	6	„ 24	„ 20	„ 21	D.	——	127
182	A. H.	3	„ 25	„ 23	„ 21	—	——	130
185	O. B.	4	„ 25	„ 19	„ 19	—	No. 318 - - -	132
186	F. B.	3	„ 25	„ 19	„ 21	D.	No. 301 - - -	133
188	F. B.	4	„ 26	„ 19	„ 21	D.	——	135
189	T. R.	5	„ 26	„ 20	„ 21	D.	Nos. 323, 324, 325, 327, 400, 401.	136
190	E. R.	5	„ 26	„ 20	„ 21	D.	——	137
191	R. W.	4	„ 26	„ 23	„ 21	—	No. 390 - -	138
192	W. H.	5	„ 26	„ 24	„ 21	D.	——	139
193	R. N.	4	„ 26	„ 18	„ 21	D.	Nos. 364, 365, 384, 413, 693, 694, 1161.	140
194	E. G.	3	„ 27	„ 24	„ 21	D.	Nos. 340, 354, 791 -	142
195	W. S.	3	„ 27	„ 22	„ 21	—	Nos. 378, 380, 382, 1121	143

Reference No.	Name.	Age.	Notification.	Onset.	Last Day of School Attendance.	Result.	Other Cases in House.	Reference to House List.
197	L. B.	5	Feb. 26	Feb. 19	Feb. 21	D.	——	141
198	W. C.	4	„ 27	„ 21	„ 21	D.	——	144
200	A. C.	5	„ 27	„ 20	?	—	Nos. 355, 319, 437, 673 -	146
201	E. C.	4	„ 27	„ 22	„ 21	D.	No. 199 - - -	145
204	A. C.	5	„ 28	„ 25	„ 21	D.	Nos. 422, 423 - -	149
207	S. A.	6	„ 28	„ 21	„ 21	D.	Nos. 421, 439 - -	152
208	G. S.	3	„ 28	„ 25	„ 21	—	——	153
211	L. S.	5	„ 28	„ 25	„ 17	—	——	155
212	F. E.	4	„ 28	„ 24	„ 26	D.	No. 403 - - -	156
215	L. C.	6	„ 29	„ 22	„ 24	D.	Nos. 498, 499 - -	159
219	E. W.	4	„ 29	„ 26	„ 26	D.	Nos. 698, 953, 954 -	161
220	A. M.	3	„ 29	„ 25	„ 14	—	——	162
225	I. H.	4	Mar. 1	„ 25	„ 21	D.	No. 528 - - -	165
226	G. H.	6	„ 1	„ 25	„ 25	—		
229	M. S.	4	„ 2	„ 27	„ 27	—	No. 446 - - -	168
237	E. N.	4	„ 2	„ 27	„ 24	—	Nos. 462, 463, 464, 721, 758.	170
240	L. H.	7	„ 3	Mar. 1	„ 28	—	Nos. 480, 856 - -	171
269	A. R.	4	„ 6	Feb. 26	„ 26	—	Nos. 552, 1169 - -	181
304	L. M.	4	„ 8	Mar. 6	„ 27	—	Nos. 328, 329 - -	207
450	P. P.	7	„ 16	„ 13	„ 24	—	Nos. 752, 916, 955 -	297

Thus, between the dates February 24th and March 16th, there were attacked 40 children in this school (boys 4, girls 2, infants 34). Prior to this time there had been one case among the boys, viz., W. B., aged 9 (No. 180), whose illness was notified on February 25th, and who came from an infected house (No. 58). Amongst the girls there had been two cases, viz., F. L., aged 8 (No. 42), notified on January 9th; she came from house No. 29, and was taken ill, together with her mother (No. 41). A third case (No. 61) was notified from this house on January 21st. The other child in the girls' school was G. P., aged 9 (No. 87), notified on February 3rd; two other cases subsequently arose in her house (No. 54), viz., M. P., aged 40 (No. 140) and E. B., aged 25 (No. 141), both notified on February 19th. There do not appear to have been any cases amongst the infants prior to February 24th.

The school was closed by order of the Sanitary Authority on February 28th.

The fatalities were confined to those attacked amongst the infants, of whom 19 out of 34 died, a case-mortality of 55·8 per cent.

In the 39 households to which these children belonged 72 cases of small-pox subsequently arose, of whom 16 died, a case-mortality of 22·2 per cent.

The 107 cases were distributed in houses as follows:—

In 11 houses,	1 case	- 11	Initial,	11	- 7 deaths.						
7 „	2 cases	- 14	„	7	- 3 „	Later,	7	- 3 deaths.			
9 „	3 „	- 27	„	10	- 4 „	„	17	- 3 „			
5 „	4 „	- 20	„	5	- 2 „	„	15	- 3 „			
4 „	5 „	- 20	„	4	- 1 „	„	16	- 3 „			
1 „	6 „	- 6	„	1	- 0 „	„	5	- 2 „			
1 „	7 „	- 7	„	1	- 1 „	„	6	- 2 „			
1 „	8 „	- 8	„	1	- 1 „	„	7	- 0 „			
39		113		40	- 19		73	- 16			

Classified according to age these cases are distributed:—

Age.	Initial.		Later.		Total.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Under 1 year - - -	—	—	9	7	9	7
1 to 10 years - - -	38	19	31	5	69	24
10 to 30 „ - - -	2	—	18	2	20	2
30 and over - - -	—	—	15	2	15	2
	40	19	73	16	113	35

Of the 40 children, 38 were unvaccinated, one (No. 444, aged 11) vaccinated, and one (No. 201, aged 4) was "under" vaccination. Of the 73 subsequent cases:—

Age.	Vaccinated.		Unvaccinated.		"Under" Vaccination.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Under 1 year - - -	—	—	8	6	1	1
1 to 10 years - - -	—	—	26	4	5	1
10 to 30 „ - -	17	2	1	—	—	—
30 and over - - -	14	1	1	1	—	—
	31	3	36	11	6	2

Board Schools, Tredworth Road.

These schools are large, commodious, and of comparatively recent construction, situated at the junction of the main Tredworth Road and High Street.

There is less to support the view that the children attending this school were infected there than in the case of the Widden Street and New Street Schools; but it will be seen from the annexed list that several were attacked whilst in attendance, or shortly after the schools were closed. In each instance only those children are indicated who were the first to be attacked in their families. There were several others amongst those attending the school who were obviously infected at their own homes, and it is not unlikely that some of these may have imported the disease into the school.

A pupil teacher (L. F. R., No. 1,054) at this school was attacked by small-pox on April 3rd, *i.e.*, 14 days from the date at which the school was closed.

CASES of SMALL-POX amongst Children attending Tredworth Road Board Schools, notified between February 25th and March 31st, 1896.

Reference No.	Name.	Sex.	Age.	Notification.	Onset.	Last Day of School Attendance.	Result.	Other Cases in House.	Reference to House List.
					BOYS.				
459	D. C.	M.	6	Mar. 16	Mar. 12	Mar. 12	D.	Nos. 738, 776, 777, 796	301
495	L. B.	M.	7	„ 17	„ 12	„ 13	—	Nos. 892, 893, 894, 1,123.	324
787	B. M.	M.	9	„ 30	„ 22	?	—	Nos. 789, 790, 792, 831	452
					GIRLS.				
407	F. B.	F.	5	„ 13	„ 9	Mar. 9	—	No. 686 - -	271
529	E. P.	F.	8	„ 19	„ 13	„ 6	—	Nos. 842, 1,369 - -	342
578	B. T.	F.	9	„ 21	„ 14	?	—	Nos. 882, 1,079, 1,080 -	369
677	R. H.	F.	11	„ 26	„ 22	?	—	Nos. 733, 1,249 - -	371
681	F. A.	F.	6	„ 26	„ 24	?	D.	——	408
683	B. A.	F.	7	„ 26	„ 23	?	—	Nos. 692, 1,111, 1,184, 1,185, 1,270, 1,331.	409
684	C. P.	F.	7	„ 26	„ 23	?	D.	Nos. 1,145, 1,266 -	410
702	A. S.	F.	8	„ 27	„ 23	?	—	——	416
712	E. B.	F.	7	„ 27	„ 25	?	—	Nos. 1,053, 1,151, 1,159 1,524.	420
746	G. S.	F.	6	„ 29	„ 25	?	D.	Nos. 1,146, 1,252 -	429
778	C. P.	F.	7	„ 30	„ 22	?	—	——	446
814	R. H.	F.	10	„ 31	„ 28	?	—	Nos. 1,271, 1,581, 1,582	466
					INFANTS.				
181	H. S.	M.	3	Feb. 25	Feb. 23	Feb. 24	—	Nos. 346, 451, 452, 672	129
288	A. S.	M.	4	Mar. 7	Mar. 5	Mar. 6	D.	Nos. 537, 538, 539, 540, 541, 542, 585, 669.	194
305	E. J.	F.	3	„ 8	„ 2	?	D.	——	208
482	A. M.	M.	4	„ 17	„ 12	„ 13	—	——	314
489	A. J.	F.	6	„ 17	„ 13	?	—	——	321
518	K. K.	F.	6	„ 19	„ 12	„ 12	D.	Nos. 868, 871, 1,089 -	337
774	L. M.	F.	5	„ 30	„ 26	?	D.	Nos. 536, 840, 917, 1,226, 1,227.	444

Thus, from February 25th to March 31st, there were (apparently) attacked in this school 22 children (boys, 3; girls, 12; infants, 7).

The school was closed by order of the Sanitary Authority on March 20th.

The deaths were 8 in number (boys, 1; girls, 3; infants, 4), a case mortality of 36·3 per cent.

In the 22 households to which these children belonged, 57 cases of small-pox subsequently arose, of which 13 died, a case mortality of 22·8 per cent.

The total (79) cases were distributed in houses as follows :—

In 6 houses, 1 case - 6	Initial, 6 - 2 deaths.				
1 „ 2 cases - 2	„ 1 - 0 „	Later, 1 - 0 death.			
4 „ 3 „ - 12	„ 4 - 2 „	„ 8 - 1 „			
3 „ 4 „ - 12	„ 3 - 1 „	„ 9 - 2 „			
5 „ 5 „ - 25	„ 5 - 1 „	„ 20 - 4 „			
1 „ 6 „ - 6	„ 1 - 1 „	„ 5 - 1 „			
1 „ 7 „ - 7	„ 1 - 0 „	„ 6 - 1 „			
1 „ 9 „ - 9	„ 1 - 1 „	„ 8 - 4 „			
22	79	22 - 8		57 - 13	

Classified according to age :—

Age.	Initial.		Later.		Total.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Under 1 year - - -	—	—	5	3	5	3
1 to 10 years - - -	20	8	19	7	39	15
10 to 30 „ - - -	2	—	13	1	15	1
30 and over - - -	—	—	20	2	20	2
	22	8	57	13	79	21

Of the 22 children, two were vaccinated, 19 unvaccinated, and one was "under" vaccination when attacked. Of the 57 "later" cases there were :—

Age.	Vaccinated.		Unvaccinated.		"Under" Vaccination.		Total.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Under 1 year - -	—	—	5	3	—	—	5	3
1 to 10 years - - -	3	—	12	6	4	1	19	7
10 to 30 „ - -	13	1	—	—	—	—	13	1
30 and over - - -	19	2	1	—	—	—	20	2
	35	3	18	9	4	1	57	13

Board Schools, Linden Road.

These are large, handsome buildings standing on open ground to the south of the city, and adjoining the site of the Infectious Diseases Hospital.

In the course of the epidemic many of the pupils were attacked with small-pox; but amongst those primarily infected, and within a period which might cause their possible infection at the school, only 12 can be named.

CASES of SMALL-POX amongst Children attending the Linden Road Board School, notified between February 7th and March 31st, 1896.

Reference No.	Name.	Sex.	Age.	Notification.	Onset.	Last Day of School Attendance.	Result.	Other Cases in House.	Reference to House List.
					MIXED.				
96	H. M.	M.	7	Feb. 7	Feb. 2	Jan. 31	—	Nos. 492, 493, 494, 501, 1,094.	64
218	W. R.	M.	8	,, 29	,, 16	Feb. 28	—	——	160
250	E. V.	F.	7	Mar. 4	Mar. 1	,, 26	—	——	175
280	A. L.	M.	8	,, 6	,, 3	Mar. 2	D.	Nos. *511*, *512*, 513, *515*.	189
316	W. H. P.	M.	8	,, 9	,, 3	,, 4	—	No. 648 - -	216
411	T. E.	M.	7	,, 13	,, 11	Feb. 21	—	Nos. 543, 793 -	275
616	G. W.	F.	12	,, 23	,, 22	Mar. 13	—	Nos. 618, 867, 963, 964, 965.	389
757	C. H.	M.	12	,, 29	,, 28	,, 10	—	Nos. 1,143, 1,144, *1,257*, *1,288*.	434
795	G. L.	F.	8	,, 31	,, 26	,, 6	—	No. 798 - -	454
812	K. L.	F.	9	,, 31	,, 28	,, 13	—	Nos. *843*, 1,175, 1,176, 1,289, 1,290.	464
					INFANTS.				
484	A. P.	M.	4	Mar. 17	Mar. 4	Mar. 4	D.	Nos. *642*, 649, 650, *829*, 830.	316
640	T. P.	M.	5	,, 24	,, 18	Feb. 28	—	Nos. 641, *736*, 832, 833.	397

In addition to the foregoing there was notified on February 19th the case of A.G., aged 14 (No. 137.), living at the school. She may have been infected by No. 96, and possibly was herself the source of infection of Nos. 250 and 316. Her attack was an extremely mild one.

It will be seen that the cases notified amongst children attending this school between February 7th and March 31st were 12 in number, but this does not include several others who were not the first to fall ill in their homes.

The school was closed by order of the Sanitary Authority on March 13th.

There were two deaths, a case mortality of 16·6 per cent.

In the 12 households to which these children belonged there arose 36 cases subsequently, of whom nine died, or 25 per cent.

The 48 cases were distributed as follows:—

In 2 houses, 1 case - 2	Initial, 2 - 0 death.				
2 ,, 2 ,, - 4	,, 2 - 0 ,,	Later, 2 - 0 deaths.			
1 ,, 3 ,, - 3	,, 1 - 0 ,,	,, 2 - 0 ,,			
3 ,, 5 ,, - 15	,, 3 - 1 ,,	,, 12 - 6 ,,			
4 ,, 6 ,, - 24	,, 4 - 1 ,,	,, 20 - 3 ,,			
12	48	12 - 2		36 - 9	

Classified according to age:—

Age.	Initial.		Later.		All.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Under 1 year - - -	—	—	2	2	2	2
1 to 10 years - - - -	10	2	23	6	33	8
10 to 30 ,, - - -	2	—	7	1	9	1
30 and over - - - -	—	—	4	—	4	—
	12	2	36	9	48	11

Of the 12 children, two were vaccinated, 10 unvaccinated, whilst the 36 others were :—

Age.	Vaccinated and Alleged.		Unvaccinated.		"Under" Vaccination.		Total.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Under 1 year - -	—	—	1	1	1	1	2	2
1 to 10 years - - -	5	—	15	5	3	1	23	6
10 to 30 „ - -	6	1	—	—	1	—	7	1
30 and over - - -	4	—	—	—	—	—	4	—
	15	1	16	6	5	2	36	9

Rycroft Street Schools (Wesleyan).

These schools, which are not board schools, are situated at the junction of Rycroft and Conduit Streets.

There were many cases of small-pox amongst the children or in their homes, but in only nine instances were these children the first of their families to be attacked during the period when they might reasonably be supposed to have been infected at the school.

No teacher contracted the disease.

CASES of SMALL-POX amongst Children attending the Rycroft Street Schools, notified between February 28th and March 25th, 1896.

Reference No.	Name.	Sex.	Age.	Notification.	Onset.	Last Day of School Attendance.	Result.	Other Cases in House.	Reference to House List.
					MIXED.				
233	J. G.	M.	11	Mar. 2	Feb. 28	Feb. 20	—	——	169
487	G. C.	F.	9	„ 17	Mar. 12	Mar. 9	—	——	319
507	A. P.	M.	12	„ 18	„ 15	„ 9	—	Nos. 760, 900, 901, 902.	332
589	C. D.	F.	10	„ 21	„ 18	„ 9	—	——	372
663	E. B.	F.	10	„ 25	„ 23	„ 9	D.	No. 664 -	403
					INFANTS.				
206	A. C.	M.	4	Feb. 28	Feb. 25	?	D.	Nos. 310, 335, 339, 424, 425, 426.	151
248	P. W.	M.	7	Mar. 4	„ 29	Feb. 28	—	——	173
376	V. P.	F.	5	„ 11	Mar. 1	?	D.	Nos. 605, 697, 708	252
606	M. B.	F.	4	„ 23	„ 20	Mar. 9	D.	——	383

From February 28th to March 25th there were notified nine cases (primary) of small-pox amongst children in this school (mixed class 5, infants 4). There were four deaths (mixed 1, infants 3) a case mortality of 44·4 per cent.

The school was closed by order of the Sanitary Authority on March 9th, hence it is improbable for at least three of the above children to have contracted the disease at the school, if indeed any of them did ; there is no evidence on the point.

In the nine households to which these children belonged 14 other cases subsequently occurred, seven being fatal, or 50 per cent.

The 23 cases were thus distributed :—

In 5 houses, 1 case - 5	Initial, 5 - 1 death.				
1 „ 2 „ - 2	„ 1 - 1 „	Later 1 - 1 death.			
1 „ 4 „ - 4	„ 1 - 1 „	„ 3 - 0 „			
1 „ 5 „ - 5	„ 1 - 0 „	„ 4 - 1 „			
1 „ 7 „ - 7	„ 1 - 1 „	„ 6 - 5 „			
9	23	9 - 4	14 - 7		

Classified according to age :—

Age.	Initial.		Later.		All.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Under 1 year -	—	—	—	—	—	—
1 to 10 years - -	5	3	8	4	13	7
10 to 20 „ - -	4	1	2	1	6	2
30 and over - -	—	—	4	2	4	2
	9	4	14	7	23	11

Of the nine children, seven were unvaccinated, and two were "under" vaccination when attacked, whilst the 14 "later" cases were thus distributed.

Age.	Vaccinated.		Un-vaccinated.	
	Cases.	Deaths.	Cases.	Deaths.
1 to 10 years -	—	—	8	4
10 to 30 „ - -	—	—	2	1
30 and over - -	4	2	—	—
	4	2	10	5

Summarising these data, in order to arrive at an approximate idea of the extent to which school infection was responsible for the spread of the disease, it appears that during a period of 7 weeks and 3 days, *i.e.*, 52 days, ending March 31st, during which the total number of cases notified amounted to 415, there were 126 proceeding from these schools who (with more or less presumption) may be assumed to have been infected therein.

These 415 cases came from 398 houses, in which 469 cases subsequently arose.

The 126 children came from 123 houses, in which 231 cases subsequently arose.

So that of a total of 984 persons attacked there were 357, or 36·2 per cent., who may have been directly or indirectly infected through children attending the elementary schools.

The subjoined tabular statements embody the facts from which this inference is drawn. The figures are, however, only approximate, as they are based on the dates of *notification*, and not of the first appearance of small-pox in the house.

HOUSES INVADED BY SMALL-POX.

Initial Cases in Children attending School.	Feb. 9 to 15.	Feb. 15 to 22.	Feb. 23 to 29.	Mar. 1 to 7.	Mar. 8 to 14.	Mar. 15 to 21.	Mar. 22 to 28.	Mar. 29 to 31.	Total.
Widden Street -	1	39	2	2	—	—	—	—	44
St. Luke's - -	—	—	26	6	4	3	—	—	39
Tredworth - -	—	—	1	1	2	7	6	5	22
Linden Road -	—	—	1	2	2	1	2	3	11
Ryecroft - -	—	—	1	2	1	3	2	—	9
	1	39	31	13	9	14	10	8	125
Other sources -	3	13	10	28	68	71	43	37	273
TOTAL - -	4	52	41	41	77	85	53	45	398

ATTACKED BY SMALL-POX.

Cases in Children attending School.	Feb. 9 to 15.	Feb. 15 to 22.	Feb. 23 to 29.	Mar. 1 to 7.	Mar. 8 to 14.	Mar. 15 to 21.	Mar. 22 to 28.	Mar. 29 to 31.	Total.
					INITIAL.				
Widden Street -	1	42	2	2	—	—	—	—	47
St. Luke's - -	—	—	26	7	4	3	—	—	40
Tredworth - -	—	—	1	1	2	7	6	5	22
Linden Road -	—	—	1	2	2	1	2	3	11
Ryecroft - -	—	—	1	2	1	3	2	—	9
	1	42	31	14	9	14	10	8	129
Other sources -	3	12	10	28	68	74	49	42	286
TOTAL - -	4	54	41	42	77	88	59	50	415
					LATER.				
Widden Street -	—	61	3	1	—	—	—	—	65
St. Luke's - -	—	—	42	15	8	8	—	—	73
Tredworth - -	—	—	4	8	1	16	14	14	57
Linden Road -	—	—	—	4	3	5	9	10	31
Ryecroft - -	—	—	6	—	3	4	1	—	14
	—	61	55	28	15	33	24	24	240
Other sources -	3	14	4	13	81	62	34	18	229
TOTAL - -	3	75	59	41	96	95	58	42	469

Lastly, the marked preponderance of children attacked during this period is obviously due to this invasion of the schools. For of the 415 "initial" cases notified, 160 were in subjects between 1 and 10 years of age, of whom 116 were apparently infected at school. Indeed, of the 98 subjects in this age-period, whose attacks were notified in the five weeks, February 9th to March 14th, no fewer than 91 were these school children.

Isolated cases also occurred amongst the children attending other of the public elementary schools of the city prior to the date of their being closed. The following is a list, kindly furnished by Mr. P. B. Cooke, assistant clerk to the school board, of these schools, and the dates of their closure:—

1.	Widden Street - - -	Closed February	21.
2.	St. James's - - -	,, ,,	28.
3.	St. Luke's - - -	,, ,,	28.
4.	Ryecroft - - - -	,, March	6.
5.	Linden Road - - -	,, ,,	13.
6.	British - - - -	,, ,,	13.
7.	St. Michael's - - -	,, ,,	13.
8.	Northgate (Wesleyan) - -	,, ,,	20.
9.	Tredworth - - -	,, ,,	20.
10.	Deacon Street - - -	,, April	1.
11.	National - - -	,, ,,	1.
12.	St. Peter's (Roman Catholic) -	,, ,,	1.
13.	St. Catharine's - - -	,, ,,	1.
14.	St. Mark's - - -	,, ,,	1.
15.	St. Mary de Lode - -	,, ,,	1.

All of these schools were re-opened on June 1st.

As regards the manner in which the Widden Street and St. Luke's schools became infected, there can only be made suggestions in the absence of positive proof. Thus:—

(*a.*) A child attended the infant school of Widden Street on January 31st, the day on which its mother (No. 78) was removed to hospital suffering from small-pox. This or analogous methods of transference of the contagion seems the most probable suggestion.

(*b.*) Classes for pupil teachers of the various elementary public schools are held in the evening at Widden Street; and it is possible that the contagion was introduced by that medium.

(*c.*) On Sundays the schools are handed over to others, and the children attending these Sunday schools include many who are not in daily attendance. It is possible that the contagion was introduced through one or other of them.

It is difficult after the lapse of two months to trace out the links of infection; one thing, however, is certain, that the current belief that the infant school at Widden Street was infected through one of the teachers contracting small-pox is not correct, since she was taken ill at the same time as the children were. Nor is there anything to substantiate another suggestion, as to the introduction of the disease by persons employed at the schools.

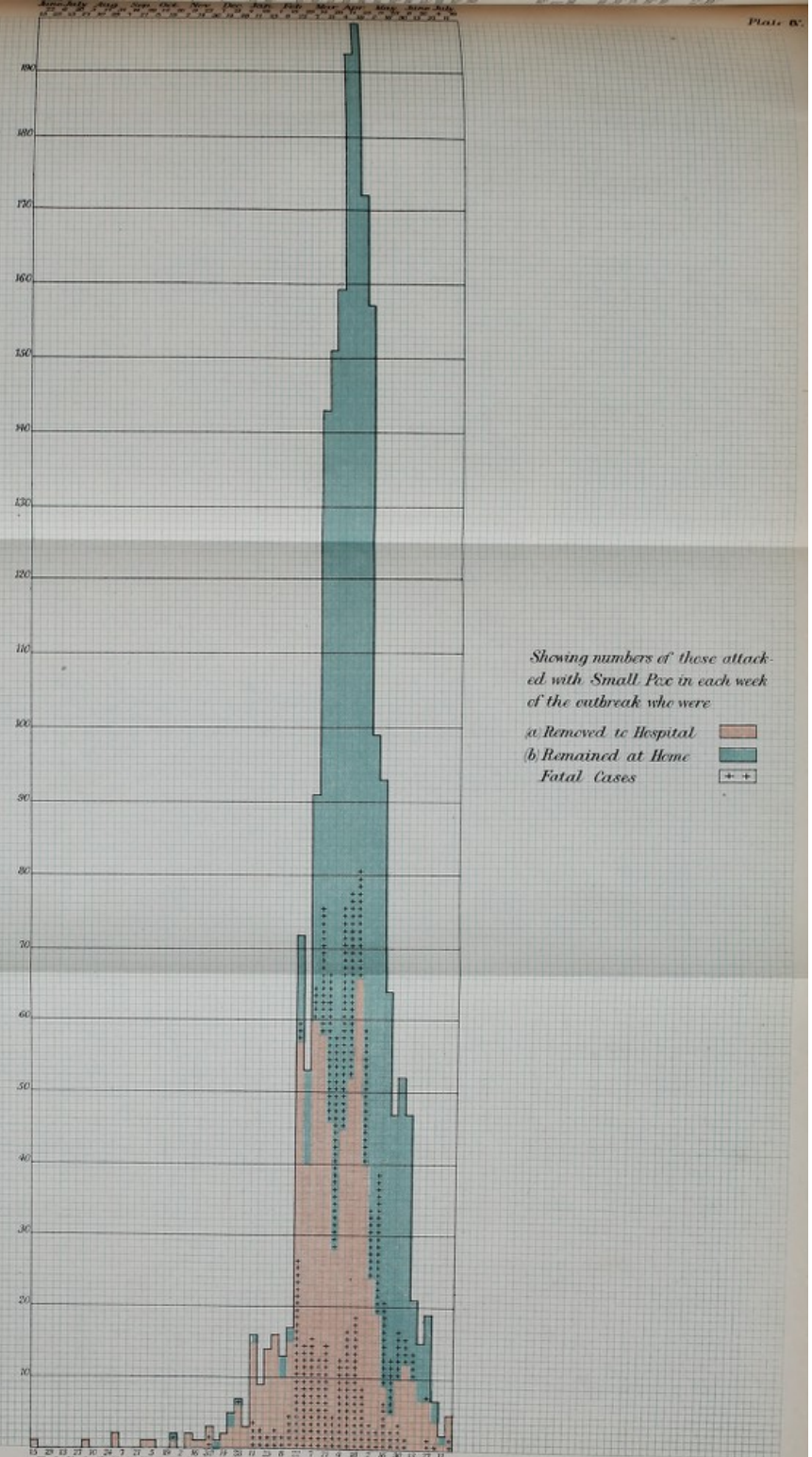
After all, with small-pox prevalent in the vicinity, and amongst the houses from which the children came, it is not surprising that the schools were infected. It would indeed have been more remarkable had they escaped such infection, under the special circumstances of this outbreak.

§ 11. Hospital Isolation.

Throughout the 30 weeks of 1895, and until the third week in February 1896, practically every case of small-pox was removed to the Stroud Road Hospital on the day that it was notified to the authorities. There are a few cases which were not known at the time that were not so removed. But from this date onwards, and with increasing numbers throughout the ensuing weeks, cases had to be left at their homes, whilst, when in the month of April, the hospital accommodation had been extended so that it would have been possible to have isolated every case, the majority declined to be removed, some of them requiring to be compelled by magistrates' orders, others resisting the execution of the law. This reluctance to enter the hospital was owing partly to the heavy mortality which had occurred there during the time when it was full of children attacked in February, and partly to the preference of the people to be treated "hydropathically," even to the extent of resistance to magisterial authority.

The following table (and Plate IV.) gives the numbers removed throughout the epidemic, arranged in the weeks in which they were *attacked*, the deaths referring to those occurring amongst these cases:—

Date.	Removal to Hospital.		Remained at Home.		Total.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
June 1895 to January 4, 1896	28	2	5	2	33	4
Week ending January 11	15	4	1	—	16	4
" " " 18	9	3	—	—	9	3
" " " 25	14	2	—	—	14	2
" " February 1	16	3	—	—	16	3
" " " 8	10	2	3	—	13	2
" " " 15	15	5	2	—	17	5
" " " 22	57	27	15	3	72	30
" " " 29	40	15	13	—	53	15
" " March 7	60	16	31	5	91	21
" " " 14	58	13	85	18	143	36
" " " 21	46	15	105	21	151	35
" " " 28	28	5	131	30	159	35
" " April 4	45	13	148	31	193	44
" " " 11	52	17	147	26	199	43
" " " 18	66	19	106	15	172	34
" " " 25	40	9	117	19	157	28
" " May 2	24	4	75	10	99	14
" " " 9	19	3	74	20	93	23
" " " 16	9	7	55	12	64	19
" " " 23	5	3	42	8	47	11
" " " 30	10	4	42	7	52	11
" " June 7	12	2	35	4	47	6
" " " 14	10	—	11	4	21	4
" " " 21	7	—	8	—	15	—
" " " 28	7	2	12	1	19	3
" " July 4	4	1	3	—	7	1
" " " 11	1	—	1	—	2	—
" " " 18	5	2	—	—	5	2
	712	198	1,267	236	1,979	434



Showing numbers of those attacked with Small Pox in each week of the outbreak who were

(a) Removed to Hospital

(b) Remained at Home

Fatal Cases

To face page 128.

There were thus removed to hospital, 712 persons, of whom 198 died, a mortality of 27·8 per cent.

There remained under treatment in their homes 1,267, of whom 236 died, a mortality of 18·6 per cent.

It often happened in the course of the epidemic that only some of those attacked in a household could be isolated, and in many instances those were not the first cases to arise in the house. Without complicating the question by referring to all such instances, it may suffice to say that there were 425 households from which the *initial* cases of small-pox were sent to hospital. In 164 of these houses 352 additional cases occurred. Hence there were in the houses from which the earliest cases were removed :—

Single cases - - 261 or 61·4 per cent.
Multiple cases - - 164 „ 38·6 „

Contrasting these figures with those of the attacks in houses where the *initial* cases (and, in most instances, the later ones also) were not removed to hospital, but remained under treatment at home, there is no very appreciable degree of difference between the two series. Thus, in the latter category there were 673 households in which 1,203 cases occurred. In 268 of these there occurred more than one case of small-pox, the proportion therefore being :—

Houses with single cases - - - 405 or 60 per cent.
„ „ multiple cases - - 268 „ 40 „

The difference between the two series in the number of houses infected is barely 2 per cent.

A more exact comparison between these series is afforded by the following list which shows that, except where two cases occurred in a house, there was much uniformity in the two groups :—

	Number of Houses from which the Initial Case					
	Removed to Hospital.			Remained at Home.		
Yielding	1 case,	261 =	261 cases.	405 =	405 cases.	
„	2 cases,	80 =	160 „	146 =	292 „	
„	3 „	38 =	114 „	56 =	168 „	
„	4 „	17 =	68 „	27 =	108 „	
„	5 „	16 =	80 „	21 =	105 „	
„	6 „	6 =	36 „	10 =	60 „	
„	7 „	3 =	21 „	4 =	28 „	
„	8 „	2 =	16 „	2 =	16 „	
„	9 „	1 =	9 „	1 =	9 „	
„	11 „	1 =	11 „	—	—	
„	12 „	—	—	1 =	12 „	
		425	776	673	1,203	

This approximation of the extent of family infection, no matter whether the first case was removed or not, may be partly due to the fact that, in the first series, perhaps the later arising cases remained at home and infected others, and also that in the first period cases could not be removed so promptly. But even if this be the case it seems to show that hospital isolation, however promptly carried out, cannot prevent infection within the house, such infection often occurring, in my opinion, prior to the appearance of the exanthem, and therefore prior to any notification or removal.

Hospital isolation has its chief gain in limiting the spread of disease within a district, rather than within the infected household.

In preparing an analysis of the cases treated in hospital, I have been much assisted by a list of the cases compiled by Mr. Pitt who was the medical officer in charge when I arrived at Gloucester. There had been no register kept, but brief records were taken by him of the cases. It may be useful here to give an account of the condition of the inmates of the two hospitals on the occasion of my first visit on April 3rd. On that day there were in the wards of the Stroud Road Hospital 158 cases of small-pox, and in those of the Hempstead Hospital 55 cases. [In each building there was one case admitted from the Rural Sanitary District. These two cases will be excluded from my statistics which refer only to the Urban District.]

Stroud Road Hospital.—At this time the hospital consisted of six blocks, one of which was assigned to administrative purposes, whilst three had been recently opened.

Other blocks were in course of erection, one indeed being on the point of occupation. The five blocks, each of two wards, contained beds and patients as follow :—

Block II., Ward 1, contained 12 beds, some being large and double ones, the total number of patients (all children) being 23.

Ward 2, contained 11 beds, occupied by 11 patients (adult females).

Block III.,	„	1,	„	15	„	„	15	„ (adult males).
	„	2,	„	10	„	„	10	„ „
Block IV.,	„	1,	„	14	„	„	19	„ (mostly children).
	„	2,	„	11	„	„	11	„ (adult males).
Block V.,	„	1,	„	13	„	„	16	„ (children only).
	„	2,	„	12	„	„	18	„ (mostly children).
Block VI.,	„	1,	„	17	„	„	17	„ (mostly male adults).
	„	2,	„	15	„	„	20	„ (mostly children).

Thus there were 158 patients to 130 beds, but it is right to say that where two, three, or even four children occupied one bed, they were all convalescent cases, and the capacity of the beds was of a size admitting of their accommodation.

Of the 167 cases which had been admitted from the city since the beginning of the year into Stroud Road Hospital, 157 remained there on April 3rd, and 10 had been transferred to Hempstead ; 9 had been admitted in January, 48 in February, 103 in March, and 7 in April. They comprised :—

Three patients under 1 year of age, 75 between the ages of 1 and 10 years, 51 between 10 and 30 years, 38 over 30 years.

Of the cases which were admitted in January, five were between 1 and 10 years, one was between 10 and 30, three were over 30.

Of the February cases, one was under 1 year, 38 between 1 and 10 years, five between 10 and 30 years, four over 30.

Of the March cases, two were under 1 year, 30 between 1 and 10, 41 between 10 and 30, and 30 were over 30 years.

Of the April cases, two were between 1 and 10 years, four between 10 and 30, and one was over 30 years.

Thus an excessive proportion of those in the hospital under 10 years of age had been admitted in the month of February.

Then as regards the type of the disease, one was of the *malignant* class, 77 of the *confluent*, 13 of the *coherent*, 39 of the *discrete*, and 37 of the *mild* or varioloid.

The malignant case was over 30 years of age.

Of the confluent cases, one was under 1 year of age, 45 between 1 and 10, 15 between 10 and 30, 16 over 30.

Of the coherent cases, nine were between 1 and 10 years, one between 10 and 30, three over 30.

Of the discrete cases, 17 were between 1 and 10 years, 15 between 10 and 30, seven over 30.

Of the mild cases, two were under 1 year, four between 1 and 10, 20 between 10 and 30, and 11 over 30.

Thus of all under 10 years, 59 per cent. were suffering from the severe type of small-pox (confluent), and of all above 10 years 36 per cent. (malignant and confluent), the proportion of severe cases being less between 10 and 30 than at ages over 30 years.

Of the whole number, 85 had been either vaccinated in infancy (or had been stated to have so been, although no certain evidence of it was present), and 82 were unvaccinated (or else had been vaccinated just prior to the attack of small-pox).

Of the "vaccinated," two were between 1 and 10 years, 45 between 10 and 30, 38 over 30 years.

Of the "unvaccinated," three were under 1 year, 73 between 1 and 10, and six between 10 and 30.

Thus whereas amongst those below 10 years of age upwards of 97 per cent. were "unvaccinated," amongst those above 10 barely 7 per cent. were in this condition.

The numbers and ages of those who those who were suffering from *secondary* (septic) *complications*, affording a further indication of the severity of the attacks, were as follow :

Abscesses, mostly cutaneous, occurred in 22 patients, 14 of whom were below the age of 10 years. One of these children suffered also from *otitis*, but there was no case of panophthalmitis among them. Of the eight patients above 10 years who had abscesses, six were above 30 years of age, and two of these had each lost one eye from destructive inflammation. One was a man aged 36 (No. 64 in list) whose left eye was thus destroyed; his attack had been a most severe one, and no traces of the infantile vaccination which he alleged had been performed could be detected on his arms. The other was a man of 32 who had similarly lost the right eye (No. 127 in list), and who had an abscess in the buttock as well as in lymphatic glands. Two other children also suffered from otitis. The six subjects over 30 years were the only ones amongst these patients who had been or were alleged to have been vaccinated in infancy.

Hempstead Hospital.—Only women and children were admitted here, including 10 children transferred from Stroud Road at the beginning of March, when this building was opened. One block, consisting of a single ward, was devoted to convalescents, it contained 15 patients. The other block of two wards contained acute cases, numbering 40 in all, 23 in one ward, and 17 in the other.

Of the 44 (city) cases admitted direct into this hospital who were there on April 3rd, 39 had been admitted in March, 5 in April. Of these 20 were between 1 and 10 years, 12 between 10 and 30, 12 over 30. There was a large proportion of severe cases, 30 being *confluent* attacks, two *coherent*, five *discrete*, and seven *mild*. They were thus distributed:—

Of the confluent attacks, 17 were in subjects between 1 and 10 years, five between 10 and 30, eight over 30.
Of the coherent cases, one was between 1 and 10, one between 10 and 30.
Of the discrete, four were between 10 and 30, one was over 30.
Of the mild cases, two were between 1 and 10, two between 10 and 30, one over 30.

Thus in the Hempstead Hospital (excluding the convalescent cases which had been transferred from Stroud Road) no less than 85 per cent. of those under 10 years of age were suffering from confluent small-pox, and 59 per cent. of those above 10 years.

Of these 44 patients, 21 were vaccinated, and 23 unvaccinated. Of the "vaccinated," 10 were between 10 and 30 years, 11 were over 30. Of the "unvaccinated," 20 were between 1 and 10, two between 10 and 30, and one was over 30.

Two of the patients were then suffering from abscesses, one (unvaccinated) aged 27, the other, 7 years; one, aged 4, had passed through an attack of pneumonia; another, aged 3, had laryngitis (a fatal case).

Disregarding the cases admitted in January and April, as affording figures too small for comparison, it is seen that altogether in February, there were admitted into the Stroud Road Hospital 111 patients, six of whom were subsequently transferred to Hempstead. There were 42 deaths amongst these cases, or 37·8 per cent. In March there were admitted in all 204 patients (Stroud Road 152, Hempstead Hospital 52), of whom 68 died (Stroud Road 42, Hempstead Hospital 16), or 33·5 per cent., or, in the two months together, 315 admissions, with 100 deaths, or 31·7 per cent.

Of the 315, rather more than half were under 10 years of age, viz., 160; whilst of the fatal cases more than three fourths, or 77, were of this age. In the month of February, when the mortality was highest, the proportion of children was also greatest, for of 111 cases, 76, or 68·4 per cent., were under 10, and of the 42 deaths 38, or 90 per cent., were of this age. In March, on the other hand, of the 204 cases, 84 were under 10, or 41·5 per cent., and of the 68 deaths, 39, or 57·3 per cent. were of this age.

This may be more particularly stated as *under* 1 *year*, eight admissions, six deaths, mortality 75 per cent.; *between* 1 *and* 10, 152 admissions, 71 deaths, or 46·7 per cent; *between* 10 *and* 30, 88 admissions, 13 deaths, or 14·7 per cent.; *over* 30, 67 admissions, 10 deaths, or 15 per cent.

The fatality at the age-period 1 to 10 years was in February exactly 50 per cent. (37 deaths among 74 admissions), in March (Stroud Road) 44·2 per cent. and (Hempstead) 42·3 per cent.

These figures are based on the following tables prepared from the data at my disposal.

STROUD ROAD HOSPITAL.—(February.)

Age.	Admissions.	Discharged.		Transferred to Hempstead.	In Hospital April 3rd.	
		Recovered.	Died.		Recovered.	Died.
Under 1 year - -	2	—	1	1	—	—
1 to 10 years - -	74	—	36	4	33	1
10 to 30 years - -	19	12	2	1	4	—
30 years and over - -	16	10	2	—	4	—
	111	22	41	6	41	1

STROUD ROAD HOSPITAL.—(March.)

Age.	Admissions.	Discharged.		In Hospital April 3rd.	
		Recovered.	Died.	Recovered.	Died.
Under 1 year - - -	5	—	3	1	1
1 to 10 years - - -	52	—	22	29	1
10 to 30 years - - -	57	7	9	40	1
30 years and over - -	38	3	5	30	—
	152	10	39	100	3

HEMPSTEAD HOSPITAL.—(March.)

Age.	Admissions.	Discharged.		In Hospital April 3rd.	
		Recovered.	Died.	Recovered.	Died.
Under 1 year - - -	1	—	1	—	—
1 to 10 years - - -	26	—	10	15	1
10 to 30 years - - -	12	—	1	11	—
30 years and upwards - -	13	—	1	10	2
	52	—	13	36	3

Comparison of Mortality from Small-pox between Cases sent to Hospital and those remaining at Home.

That the high death-rate amongst the cases admitted to the hospital during the months of February and March had considerable influence in deterring persons attacked with small-pox from entering the hospital has been a striking feature of this outbreak. By the middle of April the number of beds would have sufficed to have accommodated every case, yet the numbers admitted week by week continued to decline, whilst those remaining at home proved the large majority. It is therefore incumbent on me to attempt to discover whether there is any real ground for the general impression that the overcrowding of the Stroud Road buildings was the cause of the heightened mortality therein.

According to the data which I have collected, there were 712 cases treated in the hospitals, of which 198 proved fatal, a fatality of 27·8 per cent.; whilst there were 1,267 treated in their houses, 236 of which were fatal, a fatality of 18·7 per cent.

This divergence obtains at every period of life, but it will be observed that the proportion of those between the ages of 1 and 10 years admitted to hospital is higher than that of those remaining at home.

Age.	Sent to Hospital.		Remained at Home.		Total.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
	Per cent.	Per cent.	Per cent.	Per cent.		
Under 1 year - -	18	15	67	46	85	61
Proportion -	2·5	7·6	5·2	19·5		
Fatality -	—	83·3	—	68·6		
1 to 10 years - -	267	112	354	107	621	219
Proportion -	37·5	56·5	27·9	45·3		
Fatality -	—	42·	—	30·2		
10 years and upwards	427	71	846	83	1,273	154
Proportion -	60·	35·9	66·7	35·2		
Fatality -	—	16·6	—	9·8		
Total -	712	198	1,267	236	1,979	434

In order that the particular gravamen may be investigated, it will be useful to contrast these figures at two different periods of the epidemic. For this purpose we may make a division at the end of the last week in March (28th), by which date 787 cases had occurred, of which 191 were fatal, a mortality of 24·2 per cent. From March 29th to July 18th there were 1,192 cases, of which 243 were fatal, a mortality of 20·3 per cent.

Age.	Period A. June 1895 to March 28, 1896.		Period B. March 29 to July 18, 1896.		Total.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Under 1 year - -	27	20	58	41	85	61
1 to 10 years -	307	120	314	99	621	219
10 years and upwards	453	51	820	103	1,273	154
	787	191	1,192	243	1,979	434

The preponderance of children attacked in the first of these two periods is marked, the proportion of those aged 1 to 10 years to the whole number attacked being 39 per cent. in the first, and 26·6 per cent. in the second.

PERIOD A.—(June 1895 to March 28th, 1896.)

Age.	Sent to Hospital.		Remained at Home.	
	Cases.	Deaths.	Cases.	Deaths.
	Per cent.	Per cent.	Per cent.	Per cent.
Under 1 year - -	12	9	15	11
Proportion - -	3·	8·	3·8	13·9
Fatality - -	—	75·	—	73·3
1 to 10 years - - -	183	76	124	44
Proportion - -	46·2	67·8	31·7	55·7
Fatality - - -	—	41·5	—	35·5
10 years and over - -	201	27	252	24
Proportion - -	50·7	24·1	64·4	30·4
Fatality - -	—	13·4	—	9·9
	396	112	391	79

PERIOD B.—(March 29th to July 18th, 1896.)

Age.	Sent to Hospital.		Remained at Home.	
	Cases.	Deaths.	Cases.	Deaths.
		Per cent.		Per cent.		Per cent.		Per cent.
Under 1 year	6		6		52		35	
Proportion		1·9		7·		6·		22·3
Fatality		—		100		—		67·3
1 to 10 years	84		36		230		63	
Proportion		26·6		41·8		26·2		40·1
Fatality		—		42·8		—		27·8
10 years and over	226		44		594		59	
Proportion		71·5		51·1		67·8		37·6
Fatality		—		19·4		—		10·
	316		86		876		157	

Thus, in the first period, there were removed to hospital 396, of whom 112 died, a fatality of 28·3 per cent.; there remained at home 391, of whom 79 died, a fatality of 20·2 per cent.

In the second period, there were removed to hospital, 316, of whom 86 died, a fatality of 27·2 per cent.; there remained at home 876, of whom 157 died, a fatality of 17·9 per cent.

In respect to *age*, it will be seen that the preponderance of children noted in the first period is found mainly in the hospital group, and is ascribable to the large numbers admitted in the month of February of children attending the Widden Street and St. Luke's schools. In each period also, and at every age, the mortality was higher among those in hospital than among those remaining at home.

Nor, when we similarly contrast these two groups, in respect to their vaccination condition, do we find any material differences from the foregoing relations.

Of the 712 cases treated in hospital, 389 were "vaccinated," with 50 deaths, or 54·6 per cent. of the whole number, with a fatality of 12·8 per cent.

Of the 1,267 cases remaining at home, 822 were "vaccinated," with 70 deaths, or 64·8 per cent. of the whole number, with a fatality of 8·5 per cent.

Of the hospital cases, 323 were "unvaccinated," with 148 deaths, a proportion of 45·3 per cent. of the whole number, with a fatality of 45·8 per cent.

Of the cases remaining at home, 445 were "unvaccinated," with 166 deaths, a proportion of 35·1 per cent., fatality 37·3 per cent.

Again, the comparison may be made for each of the two periods above taken in dealing with age incidence with similar general result; except that the "unvaccinated" class predominated during the earlier period amongst those sent away from home:—

PERIOD A.—(June 1895 to March 28th, 1896.)

Class.	Sent to Hospital.		Remained at Home.		Total.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
		Per cent.		Per cent.		Per cent.		Per cent.
Vaccinated	182		18	246		21		428		39	
Proportion		46·		16·		63·		26·6		54·3		20·4
Fatality		—		10·		—		8·3		—		9·4
Unvaccinated	214		94	145		58		359		152	
Proportion		54·		84·		37·		73·4		45·6		79·5
Fatality		—		44·		—		40·		—		42·3
	396		112	391		79		787		191	

PERIOD B.—(March 29th to July 18th, 1896.)

Class.	Sent to Hospital.		Remained at Home.		Total.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Vaccinated - -	207	32	576	49	783	81
Proportion -	65·5	37·2	65·7	31·2	65·7	33·3
Fatality -	—	15·3	—	8·5	—	10·3
Unvaccinated - -	109	54	300	108	409	162
Proportion -	34·5	62·8	34·2	68·8	34·3	66·6
Fatality -	—	49·5	—	36·0	—	39·6
	316	86	876	157	1,192	243

This analysis shows further that, whereas in the first months the fatality in the vaccinated and unvaccinated classes respectively was only slightly higher in the hospital than in the houses, there was in the later months an excess for the vaccinated in hospital of 7 per cent., and of the unvaccinated of 13 per cent. over the rates of those treated at home.

So far it would appear as if the impression that the hospital itself were a cause of heightened mortality was grounded on fact. But it would not be fair to draw such an inference. These figures require to be controlled by statistics, showing the relative *severity* of the attacks in each series. This, I am able to supply, as with the exception of a few of the 1895 cases, and of those which proved fatal prior to my visit, I have notes of the type of attack from which every patient suffered. It will not, I think, be contended by anyone conversant with small-pox, that a case of mild or discrete type can ever become converted into one of confluent or malignant, whatever the environment or the mode of treatment. These types are as definite and pronounced as if they were specifically distinct diseases. The distinction between "coherence" and "confluence" is, perhaps, not so easily defined, but, so far as my own record goes, I have strictly limited the use of the term "coherent" to cases but little removed from the discrete form.

Analysing once more these two series (hospital and home) on the plan previously pursued, and arranging the cases into three groups: *a*. Malignant and confluent; *b*. Coherent and discrete, and *c*. Mild, we obtain the following results:—

Excluding the three "indeterminate" types of small-pox in new-born infants, there were 1,976 cases, 431 deaths. These cases comprise 852 of the malignant and confluent types, or 43·1 per cent. of all attacked; 619 of the coherent and discrete types, or 31·3 per cent.; 505 of mild type, or 25·5 per cent.

Of 710 cases sent to hospital, 382, or 53·8 per cent. were of malignant and confluent types; 186, or 26·2 per cent. of coherent and discrete; 142, or 20·0 per cent. of mild type.

Of 1,266 cases remaining at home, 470, or 37·1 per cent. were of malignant and confluent types; 433, or 34·2 per cent. of coherent and discrete; 363, or 28·6 per cent. of mild type.

This shows that the severe cases preponderated in the "hospital" over the "home" series by nearly 17 per cent.

Moreover, the actual mortality was not much different in the two series; for in the "hospital" series there were 195 deaths among 382 malignant and confluent cases, *i.e.*, 51·0 per cent. fatality; and in the "home" series there were 232 deaths among 470 malignant and confluent cases, or 49·3 per cent.*

If any notable difference had occurred in the conditions favourable or unfavourable to recovery, it would have been expressed in such a return as this. I am myself convinced that no such differences did exist, and bearing in mind the great pressure on the hospital staff during the few weeks that the wards were overcrowded, the fact that there is no indication of any marked excess in fatality, is a strong testimony to

* It is noteworthy that the hospital mortality during the first half of the epidemic, the time that it was most full of patients, was, relative to the high proportion of severe cases, actually lower than the home mortality, and much below the hospital rate during the remaining weeks, yet the general mortality had declined with the decline of the outbreak.

the manner in which their arduous duties were performed. That there were palpable defects in the hospital equipment is admitted on all sides, but that any great increase in mortality accrued thereby is, I hope, amply disproved by the facts here presented.

Finally, it may be of interest to contrast the incidence of the disease in respect to type, during the two periods which have been selected for comparison in other directions.

PERIOD A.—(June 1895 to March 28th, 1896.)

Type.	Sent to Hospital.		Remained at Home.		Total.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent
Malignant and confluent.	228	111	157	78	385	189
Proportion -	57·5	48·7	40·2	49·7	49·0	49·1
Coherent and discrete	87	1	126	—	213	1
Proportion -	22·0	—	32·3	—	27·0	—
Mild - - -	81	—	107	—	188	—
Proportion -	20·5	—	27·4	—	24.0	—
	396	112	390	78	786	190
	—	28·2	—	20·0	—	—

PERIOD B.—(March 29th to July 18th, 1896.)

Type.	Sent to Hospital.		Remained at Home.		Total.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Malignant and confluent.	154	84	313	154	467	238
Proportion -	49.0	54·5	35·7	49·2	—	51·0
Coherent and discrete	99	—	307	3	406	3
Proportion -	31.5	—	35·0	—	—	—
Mild - - -	61	—	256	—	317	—
Proportion -	19·4	—	29·2	—	—	—
	314	84	876	157	1,190	241
	—	26·7	—	17·9	—	—

It will be seen that during each period the same relative excess of severe cases occurred among those removed to hospital; and this is, I believe, in accord with general experience of all epidemic diseases where the means of isolation are limited. The worst cases are sent away by preference. Hence hospital fatality, in other fevers as well as in small-pox, always contrasts unfavourably with home fatality.

PART III.

Small-Pox and Vaccination.

§ 12. Age, Sex, and Fatality of those attacked with Small-pox.

§ 13. Type of the Disease.
Relative Proportion of Various Types during each week of the Outbreak.
Period of Greatest Severity.
Type of Attacks, in respect to Age-incidence.
Analysis of each Type, in respect to Age and Vaccination condition.
1. Malignant. 2. Confluent. 3. Coherent. 4. Discrete. 5. Mild.

§ 14. Vaccination Statistics.
Distribution of Vaccinated and Unvaccinated Classes at Various Periods of the Outbreak.
Comparison in respect to Age-incidence.
The Vaccinated Class. Type of attacks in, A. — Vaccinated. Re-vaccinated. B. — Alleged vaccination. C.—No information as to vaccination.
The Unvaccinated Class. Types of attacks. A.—Under vaccination. Detailed list. B.—Unvaccinated.

§ 12. Age, Sex, and Fatality.

There were 1,979 cases of small-pox, 434 deaths, a case mortality of 21·3 per cent. Of those attacked, 977 were males, 225 deaths, a fatality of 23 per cent.; 1,002 were females, 209 deaths, a fatality of 20·8 per cent.

The age-incidence was:—

Age.	Cases.	Deaths.	Fatality.
Under 1 year	85	61	71· per cent.
1 to 10 years	621	219	35·2 „
10 to 30 „	701	56	8· „
30 and upwards	572	98	17·1 „

Of those in the period, "under one year," there were 22 aged one month and under, and only one of these survived the attack.

Table I.

Sex and Age-Incidence of Small-Pox.

Age.	Males.		Females.		Both Sexes.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Under 1 month	11	11	11	10	22	21
1 month to 1 year	32	21	31	19	63	40
1 year to 5 years	131	57	140	57	271	114
5 to 10 years	180	59	170	46	350	105
10 to 15 years	72	5	79	5	151	10
15 to 20 „	82	3	78	6	160	9
20 to 30 „	200	19	190	18	390	37
30 to 40 „	143	16	156	28	299	44
40 to 50 „	77	15	76	10	153	25
50 to 60 „	28	9	41	7	69	16
60 to 70 „	14	7	23	2	37	9
70 and over	7	3	7	1	14	4
	977	225	1,002	209	1,979	434

The epidemic reached its acme in the week ending April 11th, but the greatest fatality occurred in the month of February, in which month also the number of children attacked was proportionally greater than at any other period of the epidemic.

As illustrating this, the 28 weeks of 1896 may be divided into seven four-weekly periods, and contrasted as to the numbers attacked and their mortality :—

Period.	Attacks.	Deaths.	Mortality.
From June 15, 1895, to January 4, 1896 - - -	33	4	12·2 per cent.
„ January 5, 1896 to February 1, 1896 - -	55	12	21·8 „ „
„ February 2, 1896, to February 29, 1896 - -	155	52	33·5 „ „
„ March 1, 1896, to March 28, 1896 - - -	544	123	22·6 „ „
„ March 29, 1896, to April 25, 1896 - - -	721	149	20·6 „ „
„ April 26, 1896, to May 23, 1896 - - -	303	67	22·1 „ „
„ May 24, 1896, to June 20, 1896 - - -	135	21	15·2 „ „
„ June 21, 1896, to July 18, 1896 - - -	33	6	18·2 „ „

§ 13. Character of the Epidemic.

There was an unusually large proportion of malignant and confluent cases, of the former especially.

The following table gives the weekly occurrence of cases of each of the five types, the inclusion of three cases of "indeterminate" type being necessitated by the fact that they were new-born infants who survived only a few hours, without exhibiting any characteristic rash.

Table II.

Weekly Incidence of Cases of Small-Pox, according to Type of Attack.

Period.	Malignant.		Confluent.		Coherent.		Discrete.		Mild.		Indeterminate.		Total Cases.	Total Deaths.
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases	Deaths.	Cases.	Deaths.	Cases.	Deaths.		
June, 1895, to January 4, 1896.	1	1	10	3	—	—	6	—	16	—	—	—	33	4
Week ending January 11	—	—	12	4	—	—	—	—	4	—	—	—	16	4
„ „ 18	—	—	7	3	—	—	2	—	—	—	—	—	9	3
„ „ 25	1	1	5	1	—	—	3	—	5	—	—	—	14	2
„ Feb. 1 -	1	1	6	2	1	—	3	—	5	—	—	—	16	3
„ „ 8 -	1	1	7	1	1	—	1	—	3	—	—	—	13	2
„ „ 15 -	—	—	10	5	2	—	3	—	2	—	—	—	17	5
„ „ 22 -	1	1	49	29	3	—	9	—	10	—	—	—	72	30
„ „ 29 -	—	—	30	15	6	—	9	—	3	—	—	—	53	15
„ March 7 -	—	—	45	21	—	—	15	—	31	—	—	—	91	21
„ „ 14 -	3	3	64	27	8	—	36	—	31	—	1	1	143	31
„ „ 21 -	6	6	64	30	13	—	30	—	38	—	—	—	151	36
„ „ 28 -	7	7	55	27	20	1	41	—	36	—	—	—	159	35
„ April 4 -	12	12	74	32	20	—	40	—	47	—	—	—	193	44
„ „ 11 -	14	14	73	27	20	—	38	1	53	—	1	1	199	43
„ „ 18 -	5	5	68	28	16	—	34	—	48	—	1	1	172	34
„ „ 25 -	5	5	46	22	19	—	33	1	54	—	—	—	157	28
„ May 2 -	4	4	30	10	16	—	25	—	24	—	—	—	99	14
„ „ 9 -	5	5	34	18	14	—	17	—	23	—	—	—	93	23
„ „ 16 -	—	—	29	19	10	—	11	—	14	—	—	—	64	19
„ „ 23 -	2	2	15	8	4	1	10	—	16	—	—	—	47	11
„ „ 30 -	1	1	19	10	9	—	13	—	10	—	—	—	52	11
„ June 6 -	—	—	14	6	9	—	11	—	13	—	—	—	47	6
„ „ 13 -	3	3	2	1	4	—	7	—	5	—	—	—	21	4
„ „ 20 -	—	—	1	—	4	—	9	—	1	—	—	—	15	—
„ „ 27 -	—	—	7	3	2	—	8	—	2	—	—	—	19	3
„ July 4 -	—	—	2	1	1	—	—	—	4	—	—	—	7	1
„ „ 11 -	—	—	—	—	—	—	—	—	2	—	—	—	2	—
„ „ 18 -	1	1	1	1	1	—	1	—	1	—	—	—	5	2
	73	73	779	354	204	2	415	2	505	—	3	3	1,979	434

There were thus—

Cases of Malignant Type - - - -	73 with	73 deaths.	
„ Confluent „ - - -	779 „	354 „	
„ Coherent „ - - - -	204 „	2 „	
„ Discrete „ - - -	415 „	2 „	
„ Mild „ - - - -	505 „	0 „	
„ Indeterminate Type - -	3 „	3 „	
	1,979	434	

Combining the malignant and confluent cases, these together formed 43 per cent. of the whole number attacked; the coherent and discrete together, 31·4 per cent.; the mild, 25·5 per cent.

Judging from the relative proportion of severe cases the epidemic attained its greatest intensity in the month of February (as already shown by the comparative mortality rates), and thence it gradually declined, as the following figures show:—

Period.	Malignant and Confluent.	Coherent and Discrete.	Mild.
June 1895 to January 4, 1896	11 or 33·3 per cent.	6 or 18·2 per cent.	16 or 48·5 per cent.
January 5 to February 1, 1896	32 „ 58·2 „	9 „ 16·4 „	14 „ 25·4 „
Feb. 2 to Feb. 29, 1896 -	98 „ 63·2 „	34 „ 22· „	23 „ 14·8 „
March 1 to March 28, 1896 -	243 „ 44·6 „	165 „ 30·4 „	135 „ 24·8 „
March 29 to April 25, 1896 -	298 „ 41·3 „	220 „ 30·6 „	201 „ 27·8 „
April 26 to May 23, 1896 -	119 „ 39·2 „	106 „ 35·1 „	78 „ 25·7 „
May 24 to June 20, 1896 -	40 „ 29·6 „	66 „ 49· „	29 „ 21·4 „
June 21 to July 18, 1896 -	11 „ 33·3 „	13 „ 39·4 „	9 „ 27·3 „
	852 „ 43·0 „	619 „ 31·4 „	505 „ 25·5 „

Table III.

Small Pox.—Type of Attack and Age.

Age.	Malignant.		Confluent.		Coherent.		Discrete.		Mild.		Indeterminate.		Total Cases.	Total Deaths.
	Cases.	Deaths.	Cases	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.		
1 month and under -	5	5	14	13	—	—	—	—	—	—	3	3	22	21
1 month to 1 year -	4	4	41	35	4	1	8	—	6	—	—	—	63	40
1 to 5 years -	6	6	192	108	34	—	26	—	13	—	—	—	271	114
5 to 10 „ - -	13	13	229	92	43	—	36	—	29	—	—	—	350	105
10 to 15 „ -	2	2	37	8	5	—	33	—	74	—	—	—	151	10
15 to 20 „ - -	4	4	26	5	9	—	51	—	70	—	—	—	160	9
20 to 30 „ -	12	12	88	25	40	—	112	—	138	—	—	—	390	37
30 to 40 „ - -	13	13	83	31	39	—	72	—	92	—	—	—	299	44
40 to 50 „ -	11	11	36	13	17	—	43	1	46	—	—	—	153	25
50 to 60 „ - -	2	2	19	13	9	1	23	—	16	—	—	—	69	16
60 to 70 „ -	1	1	9	8	3	—	8	—	16	—	—	—	37	9
70 and over - -	—	—	5	3	1	—	3	1	5	—	—	—	14	4
	73	73	779	354	204	2	415	2	505	—	3	3	1,979	434

Malignant Type.

There were no fewer than 73 fatal cases of true malignant small-pox, *i.e.*, a diffuse morbiliform rash, associated with petechial hæmorrhages in the skin, and not infrequently with hæmorrhages from mucous membranes. Death occurred rapidly, sometimes within two days of onset. Their ages and vaccination conditions are given in the accompanying table:—

Table IV.

Malignant Small-Pox.—Age and Vaccination.

Age.	Vaccinated.		Alleged Vaccination.		No information on Vaccination.		"Under" Vaccination.		Unvaccinated.		Total Cases.	Total Deaths.
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths	Cases.	Deaths.		
1 month and under	—	—	—	—	—	—	—	—	5	5	5	5
1 month to 1 year -	—	—	—	—	—	—	—	—	4	4	4	4
1 to 5 years - -	—	—	—	—	—	—	1	1	5	5	6	6
5 to 10 years -	—	—	—	—	—	—	1	1	12	12	13	13
10 to 15 years -	—	—	—	—	—	—	—	—	2	2	2	2
15 to 20 „ -	3	3	1	1	—	—	—	—	—	—	4	4
20 to 30 „ -	7	7	2	2	—	—	—	—	3	3	12	12
30 to 40 „ -	6	6	3	3	1	1	—	—	3	3	13	13
40 to 50 „ -	11	11	—	—	—	—	—	—	—	—	11	11
50 to 60 „ -	1	1	1	1	—	—	—	—	—	—	2	2
60 to 70 „ -	1	1	—	—	—	—	—	—	—	—	1	1
	19	19	7	7	1	1	2	2	34	34	73	73

It will be observed that a considerable number of the cases of this class occurred amongst adults who had been vaccinated in infancy. Some of these were not robust when attacked, but several had enjoyed good health previously, and one can only attribute the type to the patient having received a specially intense dose of the virus.

Confluent Type.

There were 779 cases in which the eruption became confluent. Several of these were very severe, with hæmorrhages occurring into the pustules on the skin, but not all of these latter were fatal. The deaths in this class amounted to 354, or 45·4 per cent.

Table V.

Confluent Small-Pox.—Age and Vaccination.

Age.	Vaccinated.		Alleged Vaccination.		No Information on Vaccination.		"Under" Vaccination.		Unvaccinated.		Total Cases.	Total Deaths.
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.		
1 month and under.	—	—	—	—	—	—	—	—	14	13	14	13
1 month to 1 year	—	—	—	—	—	—	3	3	38	32	41	35
1 to 5 years -	1	1	—	—	—	—	26	18	165	89	192	108
5 to 10 „ -	2	—	—	—	—	—	8	3	219	89	229	92
10 to 15 „ -	11	1	1	—	—	—	1	—	24	7	37	8
15 to 20 „ -	16	—	1	—	—	—	—	—	9	5	26	5
20 to 30 „ -	67	16	7	3	2	1	3	1	9	4	88	25
30 to 40 „ -	69	23	7	3	—	—	1	—	6	5	83	31
40 to 50 „ -	28	9	3	1	—	—	—	—	5	3	36	13
50 to 60 „ -	16	10	2	2	—	—	—	—	1	1	19	13
60 to 70 „ -	8	7	—	—	—	—	—	—	1	1	9	8
70 and over -	5	3	—	—	—	—	—	—	—	—	5	3
	223	70	21	9	2	1	42	25	491	249	779	354

This is the usual type of small-pox met with in unvaccinated children. The rash is confluent on the face especially, whilst the limbs may be covered with large full pustules more or less closely aggregated. It is very seldom that such large pustules (like mistletoe berries) occur in the vaccinated child, although in adults many severe cases do occur. There are also certain mortifications in course and character to be observed in this type of the disease, almost exclusively amongst the vaccinated. One is that, after a severe onset and very full eruption, the stage of maturation is remarkably abbreviated, there being comparatively little suppuration, and consequently no secondary fever. Another is an eruption of closely aggregated, broad, flat, papules, which give the face an aspect not unlike that of elephantiasis; such cases are not common. They do not become pustular.

The profuseness of the rash, concealing the sites of vaccination, accounts for the rather large proportion of the "alleged vaccination" class in the above table, a proportion which would doubtless have been heightened had opportunity occurred for thorough inspection of every case other than those in hospital.

Coherent Type.

There were 204 cases in which the eruption was considered to be coherent. These approximated more to the discrete variety than the confluent, many having only a few coherent pustules on the face. There were two fatal cases, one an infant, and the other a woman, aged 56.

There were no cases under the age of one month.

Table VI.

Coherent Small-Pox.—Age and Vaccination.

Age.	Vaccinated.		Alleged Vaccination.		"Under" Vaccination.		Unvaccinated.		Total Cases.	Total Deaths.
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.		
1 month to 1 year	—	—	—	—	1	—	3	1	4	1
1 to 5 years	—	—	—	—	3	—	31	—	34	—
5 to 10 „	1	—	1	—	12	—	29	—	43	—
10 to 15 „	3	—	—	—	1	—	1	—	5	—
15 to 20 „	7	—	—	—	—	—	2	—	9	—
20 to 30 „	38	—	1	—	—	—	1	—	40	—
30 to 40 „	36	—	1	—	—	—	2	—	39	—
40 to 50 „	16	—	—	—	—	—	1	—	17	—
50 to 60 „	9	1	—	—	—	—	—	—	9	1
60 to 70 „	3	—	—	—	—	—	—	—	3	—
70 and over	—	—	1	—	—	—	—	—	1	—
	113	1	4	—	17	—	70	1	204	2

Discrete Type.

There were 415 cases of the discrete type of eruption varying much in the extent of the rash. The two deaths were not due to variola *per se*, but to intercurrent diseases (phthisis in one, bronchitis in the other).

Table VII.

Discrete Small-Pox.—Age and Vaccination.

Age.	Vaccinated.		Alleged Vaccination.		"Under" Vaccination.		Unvaccinated.		Total Cases.	Total Deaths.
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.		
1 month to 1 year	—	—	—	—	2	—	6	—	8	—
1 to 5 years	—	—	—	—	7	—	19	—	26	—
5 to 10 „	4	—	—	—	5	—	27	—	36	—
10 to 15 „	31	—	—	—	—	—	2	—	33	—
15 to 20 „	49	—	—	—	1	—	1	—	51	—
20 to 30 „	110	—	1	—	—	—	1	—	112	—
30 to 40 „	69	—	2	—	—	—	1	—	72	—
40 to 50 „	41	1	1	—	—	—	1	—	43	1
50 to 60 „	21	—	1	—	—	—	1	—	23	—
60 to 70 „	8	—	—	—	—	—	—	—	8	—
70 and over	3	1	—	—	—	—	—	—	3	1
	336	2	5	—	15	—	59	—	415	2

Mild Type.

There are 505 cases in this category, the majority having a most sparse eruption, and very slight prodromal fever. The group includes five cases of *inoculated* small-pox, all in vaccinated subjects, who were inoculated whilst nursing severe cases in their families.

Table VIII.

Mild Small-Pox.—Age and Vaccination.

Age.	Vaccinated.		Alleged Vaccination.		"Under" Vaccination.		Unvaccinated.		Total Cases.	Total Deaths.
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.		
One month to one year -	—	—	—	—	4	—	2	—	6	—
1 to 5 years - -	—	—	—	—	4	—	9	—	13	—
5 to 10 „ - -	17	—	—	—	3	—	9	—	29	—
10 to 15 „ - -	71	—	—	—	2	—	1	—	74	—
15 to 20 „ - -	69	—	—	—	—	—	1	—	70	—
20 to 30 „ - -	137	—	1	—	—	—	—	—	138	—
30 to 40 „ - -	92	—	—	—	—	—	—	—	92	—
40 to 50 „ -	46	—	—	—	—	—	—	—	46	—
50 to 60 „ - -	16	—	—	—	—	—	—	—	16	—
60 to 70 „ - -	14	—	2	—	—	—	—	—	16	—
70 and over - -	5	—	—	—	—	—	—	—	5	—
	467	—	3	—	13	—	22	—	505	—

§14. Small-Pox and Vaccination.

In the following table the incidence of small-pox amongst the vaccinated and unvaccinated during each week of 1896 is given (*see also* Plates V. and VI.); and it will be seen that the period of greatest severity, *i.e.*—the month of February—which has already been exemplified from our analysis of the mortality and of the type of attacks is that period in which the unvaccinated class preponderated.

In the "vaccinated class" are included those who were "alleged" to have been unvaccinated, but who showed no evidence of it, and those in which no information could be obtained; whilst in the "unvaccinated class" are included those who were "under" vaccination when attacked, *i.e.*, vaccinated primarily during the incubation stage.

Period.	Vaccinated Class.		Unvaccinated Class.		Total.
	Attacks.	Proportion.	Attacks.	Proportion.	
June, 1895 to Jan. 4, 1896 -	23	69·7 per cent.	10	31·3 per cent.	33
January 5, to February 1, 1896 -	29	52·7 „	26	47·3 „	55
February 2 to February 29, 1896	46	29·7 „	109	70·3 „	155
March 1 to March 28, 1896 -	330	60·6 „	214	39·4 „	544
March 29 to April 25, 1896 -	474	65·7 „	247	34·3 „	721
April 26 to May 23, 1896 -	189	62·3 „	114	37·7 „	303
May 24 to June 20, 1896 -	94	69·6 „	41	31·4 „	135
June 21 to July 18, 1896 -	26	78·8 „	7	21·2 „	33
	1,211	61·2 „	768	38·8 „	1,979

Table IX.

Weekly Incidence of Small-Pox according to Vaccination Condition of the attacked.

Date.	Vaccinated.		Alleged Vaccination.		No information.		"Under" Vaccination.		Unvaccinated.		Total Cases.	Total Deaths.
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.		
June, 1895, to January 4, 1896.	22	—	—	—	1	—	—	—	10	4	33	4
Week ending— January 11.	5	2	—	—	—	—	—	—	11	2	16	4
January 18 -	3	1	—	—	—	—	—	—	6	2	9	3
„ 25 -	7	—	1	—	—	—	1	—	5	2	14	2

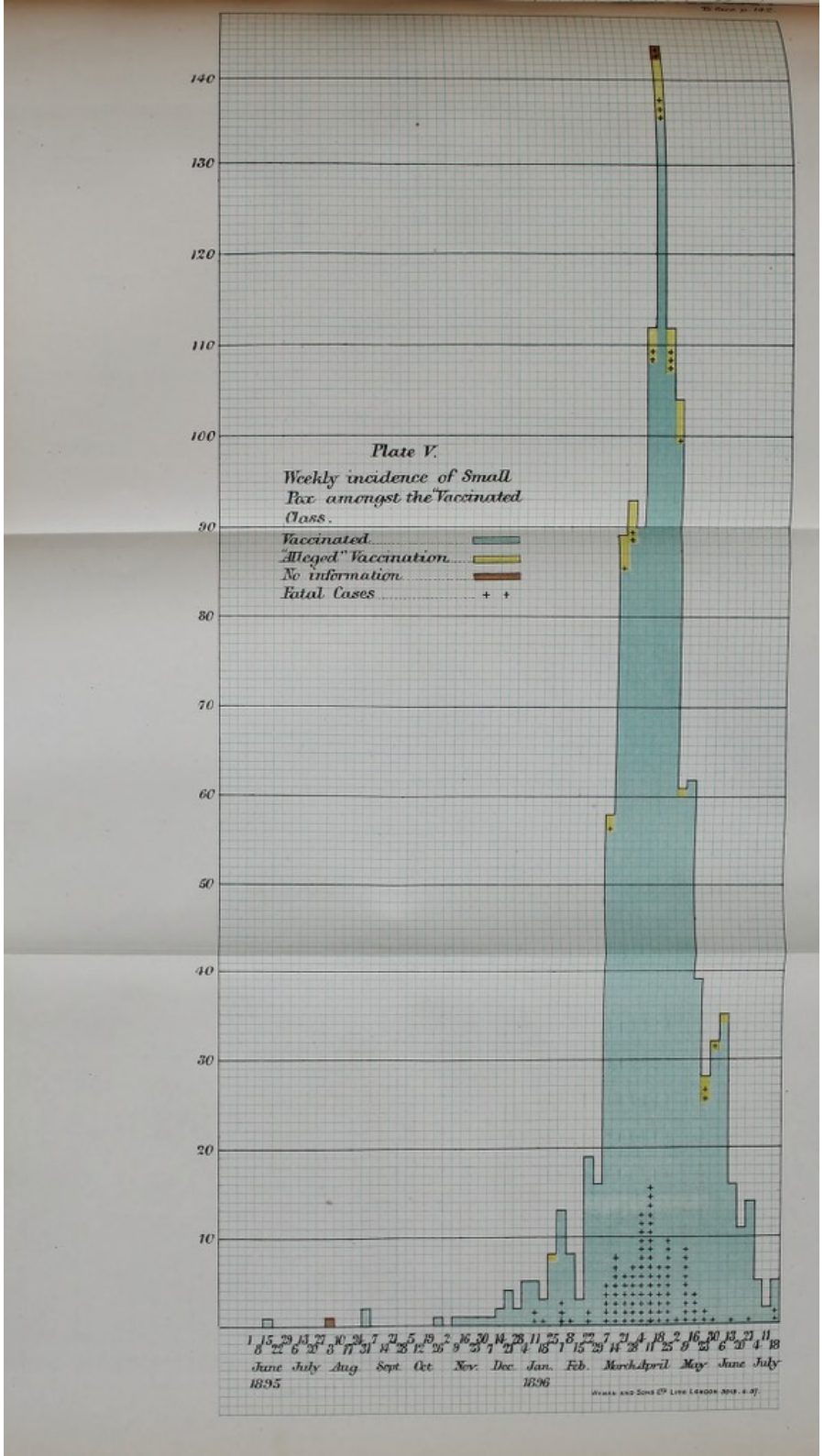
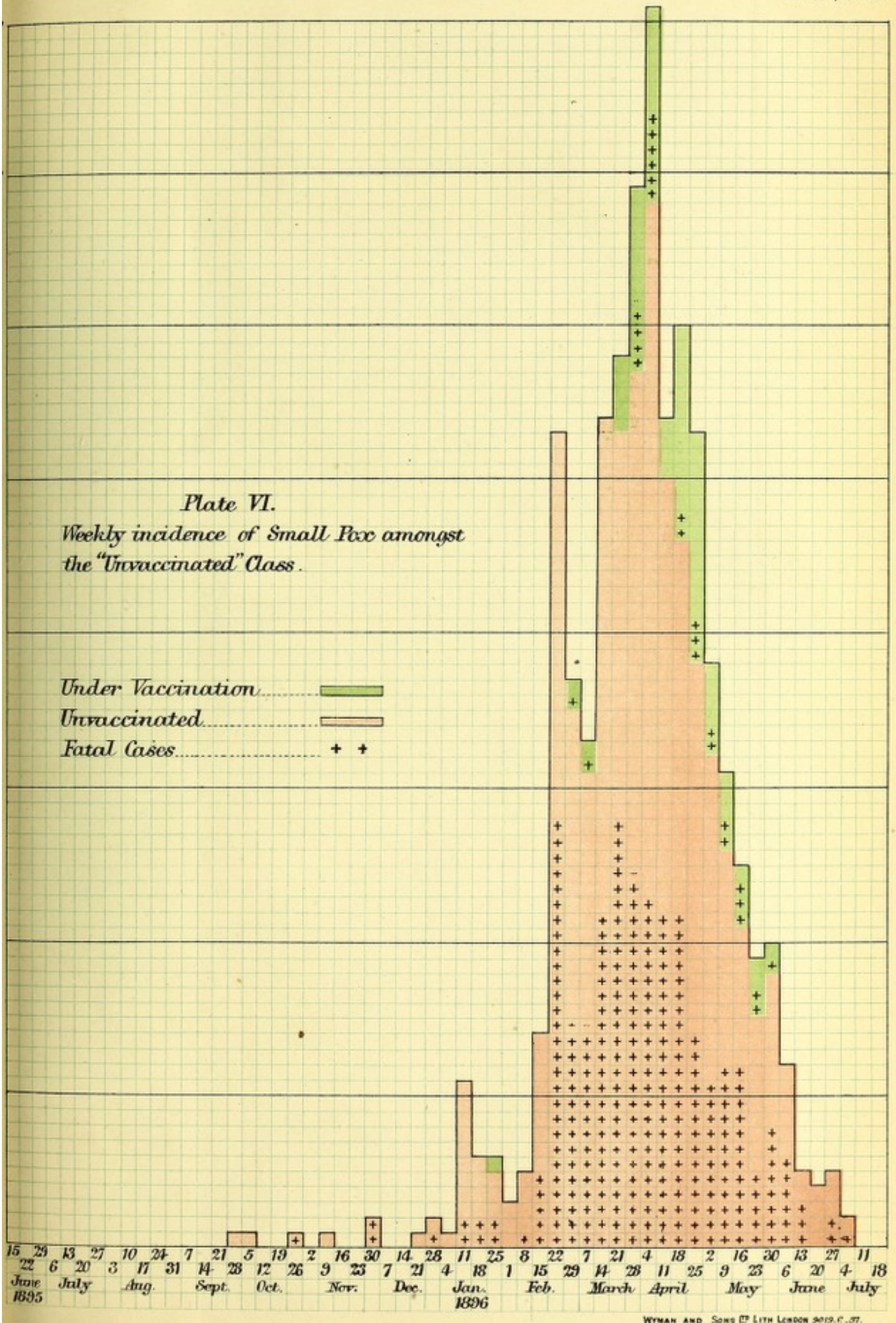
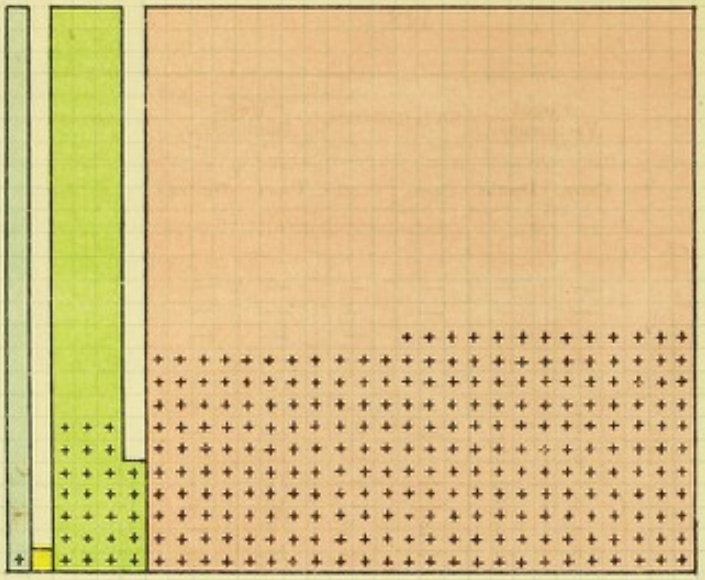


Plate V.
Weekly incidence of Small Pox amongst the Vaccinated Class.
Vaccinated
"Alleged" Vaccination
No information
Fatal Cases
140
130
120
110
100
90
80
70
60
50
40
30
20
10
June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. March April May June July
1895
1896

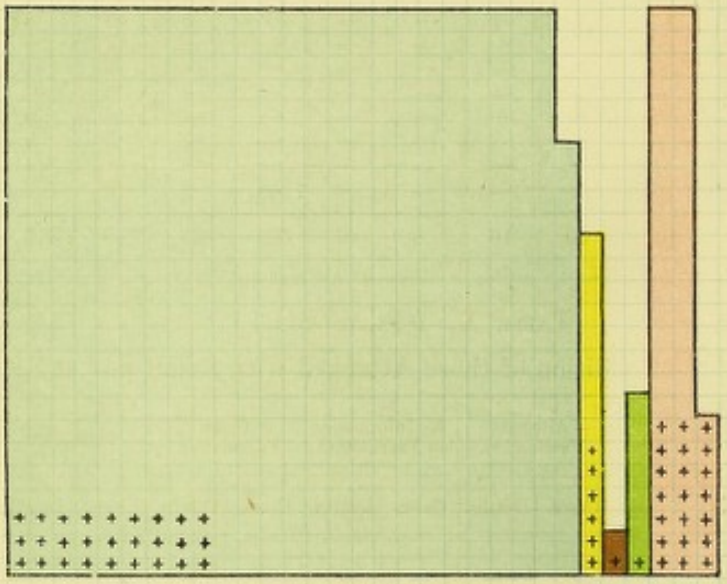


WYMAN AND SONS LTD LITH LONDON 9019.C.37.

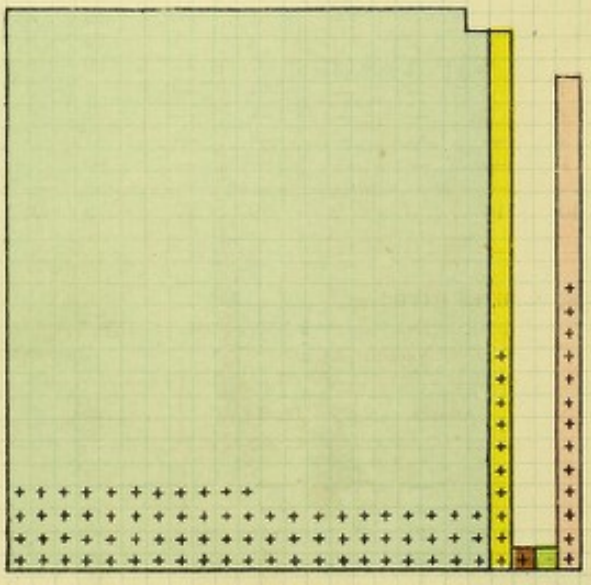
SMALL POX ATTACKS, AND DEATHS WITH REGARD TO AGE AND VACCINATION.



UNDER 10 YEARS.



10 TO 30 YEARS.



30 YEARS & OVER.

Vaccinated.
Alleged Vaccination.
No information.

Under Vaccination.
Unvaccinated.
Fatal Cases.

To face p. 143.

Wyman & Sons, Cr. Lith. 9019. 3. 87.

Date.	Vaccinated.		Alleged Vaccination.		No Information.		"Under" Vaccination.		Unvaccinated.		Total Cases.	Total Deaths.
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.		
Week ending—												
February 1	13	3	—	—	—	—	—	—	3	—	16	3
„ 8	8	1	—	—	—	—	—	—	5	1	12	2
„ 15	3	—	—	—	—	—	—	—	14	5	17	5
„ 22	19	2	—	—	—	—	—	—	53	28	72	30
„ 29	16	—	—	—	—	—	2	1	35	14	53	15
March 7	56	5	2	1	—	—	2	1	31	14	91	21
„ 14	85	8	4	1	—	—	—	—	54	22	143	31
„ 21	88	6	5	2	—	—	5	—	53	28	151	36
„ 28	90	7	—	—	—	—	12	4	57	24	159	35
April 4	108	13	4	2	—	—	13	6	68	23	193	44
„ 11	135	16	8	3	2	2	4	—	50	22	199	43
„ 18	107	7	5	3	—	—	14	2	46	22	172	34
„ 25	99	10	5	1	—	—	15	3	38	14	157	28
May 2	60	1	1	—	—	—	6	2	32	11	99	14
„ 9	62	9	—	—	—	—	5	2	26	12	93	23
„ 16	39	4	—	—	—	—	4	3	21	12	64	19
„ 23	25	2	3	2	—	—	4	2	15	5	47	11
„ 30	31	1	1	1	—	—	2	1	18	8	52	11
June 6	34	—	1	—	—	—	—	—	12	6	47	6
" 13	16	1	—	—	—	—	—	—	5	3	21	4
„ 20	11	—	—	—	—	—	—	—	4	—	15	—
„ 27	14	1	—	—	—	—	—	—	5	2	19	3
July 4	5	—	—	—	—	—	—	—	2	1	7	1
„ 11	2	—	—	—	—	—	—	—	—	—	2	—
„ 18	5	2	—	—	—	—	—	—	—	—	5	2
	1,168	102	40	16	3	2	89	27	679	287	1,979	434

Table X. (Plate VII.)

Vaccination.—Condition of those Attacked with Small-pox at Ages.

Age.	Vaccinated.		Alleged Vaccination.		No Information on Vaccination.		"Under" Vaccination.		Unvaccinated.		Total Cases.	Total Deaths.
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.		
1 month and under	—	—	—	—	—	—	—	—	22	21	22	21
1 month to 1 year	—	—	—	—	—	—	10	3	53	37	63	40
1 to 5 years	1	1	—	—	—	—	41	19	229	94	271	114
5 to 10 „	24	—	1	—	—	—	29	4	296	101	350	105
10 to 15 „	116	1	1	—	—	—	4	—	30	9	151	10
15 to 20 „	144	3	2	1	—	—	1	—	13	5	160	9
20 to 30 „	359	23	12	5	2	1	3	1	14	7	390	37
30 to 40 „	272	29	13	6	1	1	1	—	12	8	299	44
40 to 50 „	142	21	4	1	—	—	—	—	7	3	153	25
50 to 60 „	63	12	4	3	—	—	—	—	2	1	69	16
60 to 70 „	34	8	2	—	—	—	—	—	1	1	37	9
70 and over	13	4	1	—	—	—	—	—	—	—	14	4
	1,168	102	40	16	3	2	89	27	679	287	1,979	434

Collated in age periods, these figures give:—

Age.	Vaccinated Class.		Unvaccinated Class.	
	Attacks.	Deaths.	Attacks.	Deaths.
1 month and under	—	—	22	21
1 month to 1 year	—	—	63	40
1 to 10 years	26	1	595	218
10 to 30 „	636	34	65	22
30 and over	549	85	23	13
	1,211	120	768	4

so that the case mortality in each class at each age period was :—

Age.	Vaccinated Class.	Unvaccinated Class.
1 month and under - -	—	95·4 per cent.
1 month to 1 year - - -	—	63·5 „
1 to 10 years - - -	3·8 per cent.	36·6 „
10 to 30 „ - - -	5·3 „	33·8 „
30 and over - - - -	15·4 „	56·5 „

There were no vaccinated infants under one year of age attacked with small-pox, and 25 children below the age of 10 years.* The youngest of these was a female child, (No. 1,695), four years old, who was attacked with small-pox on May 7th, she having been vaccinated on April 15th. The case therefore approximates closely to those in the group "under vaccination," but assuming that in her case the incubation period was of the usual extent, it has not been included in that category. The vaccination was performed in three places, three weeks before the attack of small-pox commenced, and when I saw the child a few days later there were three inflamed vaccinal sites covered by dark scabs. The eruption was then profuse, but was more marked on the arms than on the face. Although severe in type, I did not then anticipate that the case would end fatally. Death took place on the 10th day of illness. It is noteworthy, that when this child was vaccinated her mother was severely ill, and a younger child was attacked 10 days after the death of its sister. Another case of a young vaccinated subject being attacked severely with small-pox is that of W. H., seven years of age (No. 1,144). He was one of a family of seven, all of the five children being attacked. Two of these children (Nos. 1,287 and 1,288) were unvaccinated, aged five and three years respectively, they both died, the youngest having a malignant attack. A boy of 12 (No. 757), the first to be attacked, and a girl of nine years (No. 1,143), had quite mild attacks. They, like W. H., were vaccinated. He had four large foveate cicatrices. His attack was a confluent one and left his face much pitted. The third example of confluent small-pox in a vaccinated child under 10 years is the case of W. W., a boy of eight years of age (No. 1,607), who had two faintly marked cicatrices of his infantile vaccination. He was one of a family of nine, all vaccinated; five of them being attacked with small-pox, this boy being the last. His attack was a confluent one, as also was those of his brothers (Nos. 412 and 1,127), but a sister aged 11 had a mild attack.†

In severe cases the vaccination marks are often obscured by the eruption, and hence many vaccinated persons are to be found in the next group, that of "alleged" vaccination. It is right to add that, except in the case of young subjects under 20, and of all those seen in hospital, there was no systematic verification of the statement made by the patient or his (or her) attendants. It is possible that had this been done, the "alleged" group might have been considerably larger.

There are 1,168 cases included in the "vaccinated" list, of which 102 were fatal, a mortality of 8·7 per cent. If to these be added 40 "alleged" cases (16 deaths), and three of whom no information at all upon vaccination was obtainable, there would be in all 1,211 cases with 120 deaths, a mortality of nearly 10 per cent.

Other analyses as to age and type of attack may be made from the three tables appended.

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*. Also one, No. 1,527, "alleged" to have been vaccinated, coherent attack.

† Reference to the Table of Cases will afford particulars of the other cases under 10 years of age. One was coherent (No. 1,117), four discrete cases, namely, (Nos. 821, 1,185, 1,584, 1,896), and 17 mild in type (Nos. 307, 501, 513, 578, 603, 776, 862, 867, 928, 1,008, 1,053, 1,143, 1,347, 1,721, 1,725, 1,765, 1,958.)

The Vaccinated Class.

A.—*Vaccinated.*

Table XI. (Plate VIII.)

Age and Type of Attack.

Age.	Malignant.		Confluent.		Coherent.		Discrete.		Mild.		Total Cases.	Total Deaths.
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.		
1 to 5 years -	—	—	1	1	—	—	—	—	—	—	1	1
5 to 10 „ -	—	—	2	—	1	—	4	—	17	—	24	—
10 to 15 „ -	—	—	11	1	3	—	31	—	71	—	116	1
15 to 20 „ -	3	3	16	—	7	—	49	—	69	—	144	3
20 to 30 „ -	7	7	67	16	38	—	110	—	137	—	359	23
30 to 40 „ -	6	6	69	23	36	—	69	—	92	—	272	29
40 to 50 „ -	11	11	28	9	16	—	41	1	46	—	142	21
50 to 60 „ -	1	1	16	10	9	1	21	—	16	—	63	12
60 to 70 „ -	1	1	8	7	3	—	8	—	14	—	34	8
70 and over -	—	—	5	3	—	—	3	1	5	—	13	4
	29	29	223	70	113	1	336	2	467	—	1,168	102

So that *at all ages* amongst those known to have been vaccinated in infancy there were of—

Malignant attacks	-	2·4 per cent.
Confluent „	-	19·1 „
Coherent „	-	9·6 „
Discrete „	-	28·7 „
Mild attacks	-	40·0 „

Whilst at periods *under* 10 *years of age* there were 17 *mild* attacks out of a total of 25, or 68 per cent.; 5 coherent and discrete attacks, or 20 per cent., and 3 confluent, or 12 per cent.

Re-vaccination.—The proportion of individuals attacked with small-pox who were said to have been re-vaccinated was considerable.

It will be seen from the annexed list which has been extracted from the general table of cases that 190 fall into this category.

Of these, however, there is positive evidence that the re-vaccination was unsuccessful in 62 instances; and this number probably falls short of the real number of failures, as in the cases of those who had been re-vaccinated some years previously, or had died, only oral evidence was obtained.

Assuming that all these were to be regarded as re-vaccinated subjects, the number 128, may be grouped in three categories:—

1.—Re-vaccination, in previous years.
2.— „ 3 months to 14 days from attack of small-pox.
3.— „ within 14 days of attack.

To the *first* category belong 37 persons, viz., 15 to 20, 1; 20 to 30, 7; 30 to 40, 14; 40 to 50, 10; 50 to 60, 2; 60 to 70, 2; 70 and over, 1.

Of these 2 died, the types of attack being confluent 7, coherent 4, discrete 5, mild 21.

To the *second* category belong 8 persons, viz., 10 to 15, 2; 20 to 30 years, 6. There were no deaths, the attacks being discrete, 3; mild, 5 (including one case of inoculated small-pox).

To the *third* category there belong 83 persons, viz., 5 to 10, 1; 10 to 15, 17; 15 to 20, 12; 20 to 30, 18; 30 to 40, 15; 40 to 50, 11; 50 to 60, 5; 60 to 70, 3; 70 and over, 1.

There were 4 deaths, and the types were confluent, 9; coherent, 7; discrete, 29; mild, 38.

Table XII.

List of Persons Attacked with Small-Pox who had been Re-Vaccinated.

—	No. in Register.	Name.	Sex.	Age.	Type of Attack.	Result.	Vaccination Scars.	Re-vaccination.		Remarks.
								Prior to Attack.	Result.	
1	82	M. S.	F.	19	Mild	R.	4 plain	2 years ago	—	
2	84	A. P.	F.	12	Mild	R.	4 „	3 days	Nil.	
3	86	S. M.	F.	49	Malignant	D.	3 „	20 years ago	Nil.	
4	92	M.A.McC.	F.	25	Discrete	R.	3 faint	In youth	—	
5	140	M. P.	F.	40	Coherent	R.	—	"Once"	—	
6	223	G. M.	M.	28	Mild	R.	2 faint	14 days and 8 days	Nil.	
7	246	E. B.	F.	56	Mild	R.	3 plain	42 years	—	
8	281	H. K.	F.	39	Confluent	R.	No marks	10 days	Nil.	
9	298	F. M.	F.	34	Confluent	R.	—	2 days	—	
10	299	— H.	F.	43	Mild	R.	—	20 years	—	
11	313	C. P.	M.	30	Mild	R.	—	Twice; last time 7 years.	—	
12	326	H. M.	M.	14	Mild	R.	—	Recent	1	
13	345	S. N. I.	M.	40	Confluent	D.	—	At 20 to 30 twice; first successful.	—	In prison service.
14	348	G. B.	M.	46	Discrete	R.	6 marks	20 years	—	
15	379	J. T.	M.	38	Discrete	R.	—	Since onset	Nil.	Small-pox 23 years ago.
16	381	E. F.	F.	41	Confluent	R.	—	26 years	Nil.	
17	385	M. M.	F.	35	Mild	R.	5 faint	20 years	—	
18	418	A. L.	F.	67	Confluent	R.	—	10 years	—	
19	432	A. B.	M.	36	Mild	R.	4 faint	23 years	—	
20	454	E. G.	F.	34	Mild	R.	—	18 years	—	
21	472	F. C.	M.	23	Discrete	R.	—	5 days	—	
22	473	L. C.	F.	14	Discrete	R.	4 plain	5 days	Nil.	
23	483	M. P.	F.	40	Mild	R.	—	12 years	—	
24	531	H. A. P.	M.	30	Discrete	R.	—	During illness	Nil.	
25	535	G. H. T.	M.	24	Mild	R.	—	Same day	Nil.	
26	560	E. T.	F.	32	Discrete	R.	—	11 years	—	
27	579	A. M.	M.	11	Mild	R.	—	Recent	—	1 insertion.
28	582	M. S.	F.	27	Confluent	R.	5 (1 faint)	14 years	—	
29	585	G. S.	M.	12	Mild	R.	—	Recent	—	
30	609	T. M.	M.	14	Discrete	R.	—	Same day	—	
31	626	J. M.	M.	38	Confluent	R.	—	7 years	Nil.	
32	629	W. G.	M.	66	Mild	R.	—	2 years	Nil.	
33	632	W. M.	M.	12	Mild	R.	—	Same day	—	
34	649	F. P.	M.	36	Mild	R.	—	Twice	Nil.	
35	650	M. A. P.	F.	35	Mild	R.	—	1 day	—	
36	667	E. W.	F.	31	Discrete	R.	—	4 days	2	
37	677	R. H.	F.	11	Discrete	R.	—	6 days	—	
38	688	A. C.	M.	45	Discrete	R.	—	20 years	—	
39	705	A. W.	F.	29	Discrete	R.	—	2 days	—	
40	730	A. B.	M.	12	Discrete	R.	4 faint	3 days	1	
41	754	C. L.	F.	23	Confluent	R.	—	Date ?	—	
42	762	A. C.	F.	28	Mild	R.	—	3 days	—	
43	763	E. T.	M.	22	Mild	R.	—	"Twice"	—	
44	764	E. C.	F.	43	Discrete	R.	—	6 days	—	
45	765	E. B.	F.	24	Coherent	R.	—	7 years	—	
46	768	E. C.	F.	34	Confluent	D.	—	13 days	—	
47	807	M. M.	F.	24	Mild	R.	—	4 days	—	
48	810	A. M.	F.	22	Mild	R.	—	6 days	—	
49	813	L. J.	F.	24	Discrete	R.	—	"Day of rash"	Nil.	
50	822	F. B.	M.	11	Mild	R.	4 scars	Same day	—	
51	830	A. E. P.	F.	13	Mild	R.	4 „	3 days	—	
52	867	L. W.	F.	9	Mild	R.	2 faint	5 days	—	
53	887	J. O.	M.	14	Mild	R.	—	12 days ?	—	
54	911	E. A.	F.	38	Discrete	R.	—	1 day	—	
55	936	J. H. F.	M.	56	Discrete	R.	—	About 2 days	—	
56	939	K. C.	F.	35	Mild	R.	—	20 years	—	
57	962	L. L.	F.	15	Mild	R.	3 plain	2 days	4	
58	964	W. W.	M.	42	Discrete	R.	—	9 days	—	
59	965	F. W.	M.	10	Discrete	R.	—	10 days	—	
60	974	J. L.	M.	28	Mild	R.	—	Day after	Nil.	
61	977	J. F.	M.	34	Coherent	R.	—	20 years	Nil.	
62	1,004	L. M.	F.	26	Coherent	R.	—	10 days ?	—	
63	1,034	J. S.	M.	49	Mild	R.	—	3 months	Nil.	
64	1,041	W. W.	M.	35	Confluent	D.	2 plain	7 years	—	Re-vaccinated in army.
65	1,048	L. P.	F.	39	Confluent	D.	—	10 days ?	—	
66	1,064	H. S.	M.	44	Coherent	R.	—	3 days	—	
67	1,065	S. H.	F.	52	Confluent	R.	—	6 days	3	
68	1,075	A. M.	M.	37	Discrete	R.	—	13 years	—	
69	1,077	J. H.	M.	36	Mild	R.	—	16 days after onset	2	
70	1,078	M. E.	F.	13	Mild	R.	—	Recent	Nil.	
71	1,083	H. D.	M.	18	Discrete	R.	4 plain	6 days	2	
72	1,086	A. S.	F.	19	Mild	R.	—	1 day	Nil.	
73	1,090	A. B.	M.	13	Mild	R.	—	Same day	1	
74	1,095	E. M. L.	F.	15	Mild	R.	—	10 days ?	—	
75	1,100	W. H.	M.	14	Discrete	R.	—	13 days	—	
76	1,109	A. P.	M.	28	Mild	R.	8 scars	18 years	—	

—	No. in Register.	Name.	Sex.	Age.	Type of Attack.	Result.	Vaccination Scars.	Re-vaccination.		Remarks.
								Prior to Attack.	Result.	
77	1,112	E. T.	F.	32	Coherent	R.	—	18 years	—	
78	1,134	L. P.	M.	39	Mild	R.	—	8 years	—	
79	1,141	M. W.	F.	66	Mild	R.	—	33 years	—	
80	1,163	W. S.	M.	28	Confluent	D.	—	7 days	Nil.	
81	1,165	A. H.	M.	31	Mild	R.	—	6 days	—	
82	1,166	— B.	F.	72	Mild	R.	—	6 days	—	
83	1,205	E. D.	F.	39	Confluent	D.	—	Same day	—	
84	1,218	D. M.	M.	44	Confluent	R.	—	30 years	—	
85	1,227	E. M.	F.	12	Mild	R.	—	Recent	Nil.	
86	1,236	F. B.	F.	36	Mild	R.	—	20 years	—	
87	1,241	E. C.	F.	16	Confluent	R.	—	7 days	1	
88	1,243	J. C. E.	M.	43	Mild	R.	—	20 years	—	
89	1,266	— P.	F.	73	Mild	R.	—	"Often"	—	
90	1,273	E. S.	F.	56	Discrete	R.	—	7 days?	—	
91	1,275	W. F.	M.	40	Confluent	D.	—	2 days	—	
92	1,299	L. E. S.	M.	15	Coherent	R.	4 small	4 days	1	
93	1,301	C. D.	F.	15	Mild	R.	—	11 days	3	
94	1,305	M. M.	F.	60	Mild	R.	—	20 years and 7 days	4	
95	1,307	F. E. S.	F.	22	Mild	R.	—	Day after	—	
96	1,310	P. H. P.	M.	32	Mild	R.	—	12 days	—	
97	1,313	W. G.	M.	17	Discrete	R.	—	3 days	1	
98	1,315	J. A.	M.	40	Mild	R.	—	2 or 3 times	Nil.	
99	1,320	G. P.	F.	28	Mild	R.	—	5 and 7 weeks	Nil.	
100	1,321	J. C.	M.	26	Coherent	R.	—	Day of rash	Nil.	
101	1,351	T. A. S.	M.	14	Mild	R.	4 foveate	8 days	2	Previous attempt, nil.
102	1,353	P. J.	M.	28	Mild	R.	—	7 days	—	
103	1,364	M. L.	F.	30	Confluent	R.	—	1 day	1	
104	1,369	E. P.	M.	18	Mild	R.	—	Recent	Nil.	
105	1,371	F. P.	M.	30	Mild	R.	—	5 days	—	
106	1,376	E. S.	F.	30	Mild	R.	—	3 days	Nil.	
107	1,379	J. C.	M.	14	Mild	R.	—	5 days	—	
108	1,380	A. G.	M.	29	Mild	R.	—	1 month	Nil.	
109	1,396	W. S.	M.	33	Mild	R.	1 faint	8 days	4	
110	1,415	E. W.	M.	19	Discrete	R.	—	5 days	—	
111	1,419	A. A.	F.	14	Mild	R.	—	4 days	—	
112	1,422	E. B.	F.	40	Discrete	R.	—	Same day	1	
113	1,424	A. O.	F.	42	Mild	R.	3 faint	22 years	2	
114	1,425	W. O.	M.	22	Mild	R.	—	8 days	4	
115	1,430	J. D.	M.	24	Mild	R.	—	Same day	—	
116	1,436	H. K.	M.	16	Discrete	R.	3 faint	1 day	—	
117	1,441	E. D.	F.	61	Mild	R.	—	52 years and 5 days	—	
118	1,443	J. C.	M.	25	Mild	R.	—	4 months	Nil.	
119	1,448	J. L.	M.	11	Mild	R.	—	20 days	—	
120	1,449	R. F.	M.	40	Discrete	R.	2 plain	7 days	Nil.	
121	1,450	M. G.	F.	28	Discrete	R.	6 scars	6 days	—	
122	1,456	A. S.	F.	18	Mild	R.	—	6 weeks	Nil.	
123	1,459	G. L.	M.	31	Mild	R.	2 small	2½ months	Nil.	
124	1,460	T. P.	M.	33	Discrete	R.	—	1 day	1	
125	1,461	W. L.	M.	20	Mild	R.	—	2 days after	—	
126	1,487	H. H.	M.	25	Discrete	R.	—	19 days	1	
127	1,495	J. B.	M.	21	Confluent	R.	—	5 days	1	
128	1,499	E. P.	F.	42	Mild	R.	—	6 days	—	
129	1,502	D. T.	M.	44	Discrete	R.	—	10 days	1	
130	1,526	L. L.	F.	16	Discrete	R.	4 scars	3 days	1	
131	1,539	A. M.	M.	20	Discrete	R.	4 good	6 days	3	
132	1,540	T. T.	M.	32	Confluent	R.	—	8 days	Nil.	
133	1,550	W. P.	M.	24	Discrete	R.	3 scars	4 days	3	
134	1,554	J. G.	M.	17	Mild	R.	4 scars	7 years and day of rash.	—	
135	1,563	A. Y.	F.	21	Mild	R.	4 foveate	11 years	Nil.	
136	1,572	E. R.	F.	31	Confluent	R.	—	3 days	Nil.	
137	1,576	E. F.	M.	22	Mild	R.	—	3 weeks	—	
138	1,578	P. V.	M.	55	Coherent	R.	—	4 days	4	
139	1,588	E. R.	M.	43	Coherent	R.	—	15 days	Nil.	
140	1,594	E. B.	M.	38	Coherent	R.	—	6 days	Nil.	
141	1,595	S. H.	F.	23	Mild	R.	—	6 days	Nil.	
142	1,596	J. W.	M.	23	Discrete	R.	—	7 days	1	
143	1,599	W. G.	M.	15	Discrete	R.	—	9 and 1 day	Nil.	
144	1,603	A. V.	F.	15	Mild	R.	—	3 days	1	
145	1,609	W. M.	M.	52	Mild	R.	—	3 days	3	
146	1,616	J. G. W.	M.	21	Discrete	R.	3 foveate	Twice	Nil.	
147	1,620	G. E.	M.	25	Confluent	R.	—	4 days	Nil.	
148	1,624	A. F.	F.	39	Confluent	R.	—	3 weeks	Nil.	
149	1,627	S. P.	F.	40	Coherent	R.	3 plain	3 weeks	Nil.	
150	1,628	S. R.	F.	52	Mild	R.	—	47 years	—	
151	1,643	C. W. T.	M.	15	Mild	R.	2 scars	4 weeks	Nil.	
152	1,649	M. A. J.	F.	45	Coherent	R.	—	8 days	Nil.	Small-pox in infancy.
153	1,650	M. D.	F.	48	Discrete	R.	3 faint	4 days	1	
154	1,651	N. E.	F.	11	Mild	R.	4 smooth	9 days	2	
155	1,652	J. T.	M.	49	Discrete	R.	—	8 days	1	
156	1,655	G. McK.	M.	39	Coherent	R.	—	6 days	—	
157	1,669	L. P.	F.	22	Discrete	R.	—	4 days	3	
158	1,675	J. B.	M.	60	Discrete	R.	2 faint	10 days	3	Small-pox at 13.
159	1,676	E. A. B.	F.	30	Coherent	R.	—	1 day	2	
160	1,678	E. J.	F.	48	Mild	R.	—	18 and 9 years	—	
161	1,713	A. H.	M.	40	Confluent	D.	3 faint	24 years	Nil.	
162	1,715	S. T.	M.	13	Mild	R.	—	Twice recently	Nil.	
163	1,716	W. M.	M.	38	Coherent	R.	—	5 days	Nil.	

—	No. in Register.	Name.	Sex.	Age.	Type of Attack.	Result.	Vaccination Scars.	Re-vaccination.		Remarks.
								Prior to Attack.	Result.	
164	1,731	C. C.	M.	21	Mild	R.	4 plain	2 months	Nil.	
165	1,733	D. J. W.	M.	27	Discrete	R.	6 scars	5 weeks	Nil.	
166	1,738	J. B.	M.	27	Coherent	R.	—	2 days	—	
167	1,760	J. A.	M.	46	Mild	R.	—	7 days	2	
168	1,769	A. P.	M.	44	Mild	R.	6 scars	20 years	—	
169	1,770	A. H.	M.	16	Mild	R.	—	1 and 2 months	Nil.	
170	1,772	J. B.	M.	29	Discrete	R.	1 foveate	9 weeks	3	Result very imperfect (*see* list of cases).
171	1,785	E. Y.	F.	24	Mild	R.	—	5 weeks	1	
172	1,791	C. H.	M.	16	Discrete	R.	—	5 weeks	Nil.	
173	1,792	G. H.	M.	26	Mild	R.	—	6 weeks	Nil.	
174	1,806	L. C.	F.	22	Mild	R.	—	6 weeks	2	Inoculated small pox.
175	1,809	R. B.	M.	23	Discrete	R.	—	6 weeks twice	Nil.	
176	1,824	C. H.	M.	14	Discrete	R.	2 fair	2 months	Nil.	
177	1,827	W. S.	M.	25	Mild	R.	2 faint	8 days	Nil.	
178	1,830	E. N.	F.	22	Mild	R.	—	3 weeks	Nil.	
179	1,841	E. G.	F.	27	Coherent	R.	—	13 years	—	
180	1,842	E. A. L.	F.	33	Discrete	R.	—	4 years	Nil.	
181	1,863	W. D.	M.	23	Discrete	R.	4 foveate	4 months	Nil.	
182	1,873	B. B.	F.	21	Discrete	R.	—	2 months	—	
183	1,876	A. T.	F.	39	Mild	R.	—	2 months	Nil.	
184	1,892	T. P.	M.	38	Confluent	R.	—	14 years	1	
185	1,927	M. D.	F.	19	Discrete	R.	3 foveate	6 weeks	Nil.	
186	1,929	A. M. S.	F.	31	Mild	R.	—	20 years	—	
187	1,941	M. A. F.	F.	60	Mild	R.	3 foveate	20 years	Nil.	
188	1,963	H. M.	M.	14	Mild	R.	4 „	3 months	1	
189	1,964	A. W.	M.	45	Mild	R.	4 „	2 months	Nil.	
190	1,965	A. T.	F.	42	Mild	R.	3 „	20 years	Nil.	

B.—*Alleged Vaccination.*

Table XIII. (Plate VIII.)

Age.	Malignant.		Confluent.		Coherent.		Discrete.		Mild.		Total Cases.	Total Deaths.
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.		
5 to 10 years	—	—	—	—	1	—	—	—	—	—	1	—
10 to 15 „	—	—	1	—	—	—	—	—	—	—	1	—
15 to 20 „	1	1	1	—	—	—	—	—	—	—	2	1
20 to 30 „	2	2	7	3	1	—	1	—	1	—	12	5
30 to 40 „	3	3	7	3	1	—	2	—	—	—	13	6
40 to 50 „	—	—	3	1	—	—	1	—	—	—	4	1
50 to 60 „	1	1	2	2	—	—	1	—	—	—	4	3
60 to 70 „	—	—	—	—	—	—	—	—	2	—	2	—
70 and over	—	—	—	—	1	—	—	—	—	—	1	—
	7	7	21	9	4	—	5	—	3	—	40	16

The proportionate severity of attacks in this group at all ages was :—

Of malignant attacks	17·5 per cent.
Of confluent „	52·5 „
Of coherent „	10.0 „
Of discrete „	12·5 „
Of mild attacks	7·5 „

There was only one under the age of 10 years; this was a coherent attack.

N.B. — Except in malignant and confluent cases, the total absence of any vaccination scars was certain.

C.—*No information as to Vaccination.*

In three cases I have no particulars as to the vaccination condition of the individuals attacked, viz., Nos. 2, 1,154, and 1,074. They all fall between the ages of 20 and 30, two being fatal cases, one of malignant, the other of confluent type.

The Unvaccinated Class.

For purposes of statistical comparison it has seemed right to include within the "Unvaccinated Class" those who were "undergoing vaccination" when attacked by the disease. A list of the cases is appended, and as their general mortality is somewhat lower than that of those who had never undergone vaccination (even recently) it would appear as if some influence on the disease must have been exerted by the vaccination in a certain proportion of the cases.

A.—*Under Vaccination.*

Table XIV. (Plate VIII.)

Age.	Malignant.		Confluent.		Coherent.		Discrete.		Mild.		Total Cases.	Total Deaths.
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.		
1 month to 1 year	—	—	3	3	1	—	2	—	4	—	10	3
1 to 5 years -	1	1	26	18	3	—	7	—	4	—	41	19
5 to 10 „ -	1	1	8	3	12	—	5	—	3	—	29	4
10 to 15 „ -	—	—	1	—	1	—	—	—	2	—	4	—
15 to 20 „ -	—	—	—	—	—	—	1	—	—	—	1	—
20 to 30 „ -	—	—	3	1	—	—	—	—	—	—	3	1
30 to 40 „ -	—	—	1	—	—	—	—	—	—	—	1	—
	2	2	42	25	17	—	15	—	13	—	89	27

Eighty-nine of those attacked with small-pox had been vaccinated within a fortnight of their falling ill, in 20 cases the vaccination being performed either at or shortly after the actual onset of the disease. The majority (70 out of 89) were children below the age of 10. There were 27 deaths, a mortality of 30·3 per cent.

In addition to these there were others who were submitted to primary vaccination during the incubation period but in whom the vaccination did not take. They are included in the "unvaccinated" series, with which for general statistical comparison the above 89 cases may also be comprised.

Table XV.

Small-Pox Attacks whilst undergoing Primary Vaccination.

—	Reference in Register	Name.	Age.	Small-Pox. Onset.	Small-Pox. Rash.	Date of Vaccination.	Number of Insertions.	Day before Attack on which Vaccinated.	Type of Attack.	Result.	Remarks.
1	70	W. T. -	5	January 22	January 24	7 days	4 vesicles	5th	Mild - -	R.	
2	201	E. C. -	4	February 22	February 24	February 19	—	3rd	Confluent -	D.	
3	217	E. K. T. -	3	„ 24	„ 29	„ 19	—	5th	Discrete -	R.	Rash abortive.
4	262	A. H. -	10	„ 28	March 1	„ 20	—	—	Mild - -	R.	Concurrent.
5	263	E. H. -	4	„ 28	„ 1	„ 20	—	—	Confluent -	D.	Do.
6	321	A. S. -	3	—	—	April 6	—	—	Confluent -	R.	
7	508	W. H. A. -	7	March 14	March 17	March 14	—	—	Coherent -	R.	Concurrent
8	553	W. R. -	8	„ 13	„ 15	„ 12	—	1st	Confluent -	R.	
9	589	C. D. -	10	„ 18	„ 20	„ 9	—	9th	Coherent -	R.	
10	606	M. B. -	4	„ 20	„ 22	„ 22	—	—	Confluent -	D.	Concurrent.
11	624	A. M. -	5	„ 23	„ 24	„ 19	—	3rd	Coherent -	R.	
12	635	A. M. -	2	„ 21	„ 23	„ 19	—	2nd	Mild - -	R.	
13	636	F. M. -	3	„ 19	„ 21	„ 19	—	—	Mild - -	R.	Concurrent.
14	665	R. M. -	4	„ 24	„ 26	„ 19	—	5th	Confluent -	D.	
15	673	E. C. -	2	„ 21	„ 23	„ 19	—	2nd	Confluent -	R.	
16	695	V. M. -	½	„ 26	„ 26	„ 7	—	19th	Mild - -	R.	A doubtful case.
17	698	M. W. -	5	„ 29	April 1	„ 22	4 vesicles	7th	Discrete -	R.	

—	Reference in Register	Name.	Age.	Small-Pox. Onset.	Small-Pox. Rash.	Date of Vaccination.	Number of Insertions.	Day before Attack on which Vaccinated.	Type of Attack.	Result.	Remarks.
18	753	M. G.	2	March 24	March 27	March 16	4 vesicles	8th	Discrete	R.	
19	774	L. M.	5	„ 26	„ 28	„ 21	—	5th	Confluent	D.	
20	793	E. E.	2	„ 25	„ 27	„ 18	1 vesicle	7th	Coherent	R.	
21	815	C. C.	3	„ 28	„ 30	„ 28	—	—	Confluent	D.	Concurrent.
22	823	B. B.	3	„ 27	„ 30	„ 27	—	—	Confluent	D.	Do.
23	827	R. K.	8	?	?	„ 1	—	?	Coherent	R.	
24	829	E. P.	5/12	„ 29	„ 30	„ 24	—	5th	Confluent	D.	
25	837	B. C.	4	„ 28	„ 30	„ 28	—	—	Confluent	D.	Concurrent.
26	851	V. G.	3	April 28	April 30	April 22	2 vesicles	6th	Coherent	R.	Many small pustules.
27	860	J. H.	4	March 28	March 30	March 20	—	8th	Confluent	D.	
28	864	F. W.	7	„ 24	„ 26	„ 16	—	8th	Mild	R.	
29	868	H. H.	2	„ 24	„ 26	„ 25	—	—	Confluent	D.	Concurrent.
30	872	F. K.	5	„ 25	„ 27	„ 25	—	—	Discrete	R.	Do.
31	884	E. C.	5	„ 29	April 2	„ 28	—	1st	Confluent	R.	
32	916	E. P.	4	„ 29	„ 2	„ 31	—	—	Coherent	R.	Concurrent.
33	952	A. C.	2	April 2	„ 4	„ 26	—	7th	Discrete	R.	
34	963	M. W.	6	„ 4	„ 5	„ 25	—	10th	Coherent	R.	
35	1,000	G. H.	7	March 30	„ 1	April 1	—	—	Confluent	D.	Concurrent.
36	1,009	B. C.	4	April 2	„ 4	March 26	—	7th	Discrete	R.	
37	1,010	E. C.	5	„ 5	„ 7	„ 18	—	8th	Mild	R.	
38	1,089	P. K.	1/12	March 31	„ 2	„ 25	—	6th	Discrete	R.	
39	1,159	S. B.	4	?	?	"A few days"	2 vesicles	?	Confluent	R.	Rapid subsidence of rash.
40	1,173	C. G.	9	April 11	April 13	March 29	—	13th	Coherent	R.	
41	1,176	L. L.	1	„ 12	„ 14	April 12	—	—	Confluent	R.	Concurrent.
42	1,183	J. J.	20	„ 9	„ 11	„ 8	—	1st	Confluent	R.	
43	1,191	H. H.	5	„ 10	„ 12	„ 9	—	1st	Confluent	R.	
44	1,195	C. P.	4	„ 13	„ 14	„ 3	—	10th	Mild	R.	
45	1,196	L. B.	2	March 19	March 21	March 16	—	3rd	Mild	R.	
46	1,254	J. R.	26	April 13	April 15	April 14	—	—	Confluent	D.	Concurrent.
47	1,290	E. L.	10	„ 12	„ 14	„ 12	—	—	Confluent	R.	Do.
48	1,314	V. S.	6	„ 11	„ 13	„ 11	—	—	Coherent	R.	Do.
49	1,324	A. J.	3	„ 15	„ 17	„ 11	—	4th	Discrete	R.	Rash abortive.
50	1,325	A. D.	3	„ 12	„ 14	„ 12	—	—	Discrete	R.	Concurrent.
51	1,359	L. P.	6 wks.	„ 13	„ 15	„ 6	—	7th	Mild	R.	
52	1,337	W. S.	1	„ 16	„ 18	„ 23	—	7th	Confluent	D.	
53	1,338	A. W.	20	„ 16	„ 19	„ 11	4 vesicles	5th	Confluent	R.	
54	1,367	E. P.	5/12	„ 17	„ 19	„ 10	—	7th	Mild	R.	
55	1,375	H. J.	2	„ 16	„ 18	„ 9	—	7th	Confluent	R.	
56	1,386	G. C.	9	„ 20	„ 22	„ 16	4 vesicles	3rd	Coherent	R.	
57	1,399	C. W.	7	„ 16	„ 18	"10 days"	3 vesicles	8th	Confluent	R.	
58	1,414	A. C.	9	„ 19	„ 21	April 16	—	3rd	Discrete	R.	
59	1,423	D. R.	17	„ 21	„ 23	„ 21	3 vesicles	—	Discrete	R.	Concurrent.
60	1,426	T. G.	33	„ 19	„ 21	„ 15	4 vesicles	4th	Confluent	R.	
61	1,431	M. L.	6	„ 20	„ 22	„ 20	—	—	Discrete	R.	Concurrent.
62	1,446	E. R.	3/12	„ 19	„ 21	„ 13	3 vesicles	6th	Mild	R.	Sparse pustules.
63	1,451	A. J. H.	10 wks.	„ 19	„ 21	„ 10	—	9th	Discrete	R.	Rash abortive.
64	1,465	W. R.	1	„ 24	„ 26	„ 16	2 vesicles	10th	Confluent	D.	
65	1,479	F. J.	4	„ 23	„ 25	Within 7 days	—	?	Confluent	D.	
66	1,484	T. E. R.	4	„ 22	„ 23	April 17	2 vesicles	5th	Confluent	D.	
67	1,494	E. M. C.	8	„ 26	„ 25	„ 18	2 vesicles	5th	Coherent	R.	
68	1,501	G. R.	7	„ 22	„ 24	„ 13	3 vesicles	9th	Coherent	R.	
69	1,521	G. W.	7	„ 25	„ 28	„ 22	3 vesicles	3rd	Malignant	D.	
70	1,536	G. C.	10	„ 21	„ 24	„ 13	3 vesicles	8th	Mild	R.	
71	1,585	C. H.	3	„ 27	„ 30	„ 24	—	3rd	Confluent	R.	
72	1,586	J. M.	3	„ 28	„ 30	„ 27	3 vesicles	1st	Confluent	D.	
73	1,587	H. P.	2	„ 28	„ 30	„ 22	—	6th	Confluent	R.	
74	1,611	E. G.	5	„ 28	„ 30	„ 24	3 vesicles	4th	Discrete	R.	
75	1,656	E. P.	1/2	May 4	May 6	May 4	4 vesicles	—	Coherent	R.	Concurrent.

—	Reference in Register	Name.	Age.	Small-Pox. Onset.	Small-Pox. Rash.	Date of Vaccination.	Number of Insertions.	Day before Attack on which Vaccinated.	Type of Attack.	Result.	Remarks.
76	1,656	E. L. J.	4	May 6	May 7	April 24	—	14th	Malignant	D.	
77	1,663	J. P.	3	„ 4	„ 7	May 4	4 vesicles	—	Confluent	R.	Concurrent.
78	1,698	J. M.	9	„ 5	„ 7	April 30	2 vesicles	5th	Coherent	R.	
79	1,688	A. S.	1	„ 5	„ 9	May 4	—	1st	Confluent	D.	
80	1,702	M. E.	8	„ 9	„ 11	„ 6	2 vesicles	3rd	Coherent	R.	
81	1,719	H. H.	5	„ 10	„ 12	„ 7	—	3rd	Confluent	D.	
82	1,722	A. C. W.	5/12	„ 9	„ 11	„ 7	—	2nd	Confluent	D.	
83	1,739	E. W.	5/12	„ 12	„ 15	„ 7	3 vesicles	5th	Confluent	D.	
84	1,743	S. C.	2	„ 15	„ 17	„ 14	—	1st	Confluent	D.	
85	1,789	E. M.	2	—	„ 17	„ 9	3 vesicles	7th	Discrete	R.	
86	1,794	M. W.	4	May 18	„ 20	„ 18	4 vesicles	—	Confluent	D.	Concurrent.
87	1,795	H. W.	6	„ 18	„ 20	„ 18	3 vesicles	—	Confluent	R.	Do.
88	1,831	D. C.	4	„ 24	„ 26	„ 19	3 vesicles	5th	Confluent	D.	
89	1,832	E. C.	6	„ 24	„ 26	„ 19	3 vesicles	5th	Coherent	R.	

In a few instances the sparseness of the eruption, and its character, especially the tendency to minute, multiform papules and pustules, suggested that the vaccination had exerted a distinctly modifying influence upon the disease. In general, however, it is not possible to assert that such a result had occurred. An analysis of the foregoing table shows that of the 23 "concurrent" cases (vaccinated, that is, on the day of attack or even on one or two days after illness began) there were 9 deaths, or

—	Days before Onset of Small-Pox. ?	19.	14.	13.	10.	9.	8.	7.	6.	5.	4.	3.	2.	1.	Day of Attack.	Days after Onset. 1.	2.
Cases	4	1	1	1	3	3	6	9	4	12	3	9	3	7	16	5	2
Deaths	1	—	1	—	1	—	1	1	—	6	—	3	1	3	4	4	1
Malignant	—	—	1	—	—	—	—	—	—	—	—	1	—	—	—	—	—
Confluent	3	—	—	—	1	—	2	1	1	7	1	3	2	7	8	4	1
Coherent	1	—	—	1	1	2	—	1	1	3	—	3	—	—	3	—	1
Discrete	—	—	—	—	—	1	1	5	1	1	2	1	—	—	4	—	—
Mild	—	1	—	—	1	—	3	2	1	1	—	1	1	—	1	1	—

39·1 per cent.; whilst of those vaccinated 14 days or fewer before the attack, and one (doubtful) case vaccinated 19 days before, there were 18 deaths out of 66 attacks, or 27·2 per cent. Nor does a scrutiny of the type of attack lead to a much different conclusion. The proportion of severe cases was slightly higher among the "concurrent" than the remainder, there being of confluent cases in the former series 56·5 per cent., as against 45·5 per cent. (confluent and malignant) in the latter. It will be seen, however, that there are certainly more discrete and mild cases amongst those vaccinated in the earlier than in those vaccinated in the later days.

The proportionate severity of attacks at all ages, and independently of the period of vaccination, were in this group :—

Of malignant cases	2·2 per cent.
„ confluent „	47·2 „
„ coherent „	19·1 „
„ discrete „	16·8 „
„ mild „	14·5 „

the majority being under the age of 10 years.

B.—*Unvaccinated.*

TABLE XVI. (PLATE VIII.)

Age.	Malignant.		Confluent.		Coherent.		Discrete.		Mild.		Indeterminate.		Total	Total
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
1 month and under -	5	5	14	13	—	—	—	—	—	—	3	3	22	21
1 month to 1 year -	4	4	38	32	3	1	6	—	2	—	—	—	53	37
1 to 5 years -	5	5	165	89	31	—	19	—	9	—	—	—	229	94
5 to 10 „ - -	12	12	219	89	29	—	27	—	9	—	—	—	296	101
10 to 15 „ -	2	2	24	7	1	—	2	—	1	—	—	—	30	9
15 to 20 „ - -	—	—	9	5	2	—	1	—	1	—	—	—	13	5
20 to 30 „ -	3	3	9	4	1	—	1	—	—	—	—	—	14	7
30 to 40 „ - -	3	3	6	5	2	—	1	—	—	—	—	—	12	8
40 to 50 „ -	—	—	5	3	1	—	1	—	—	—	—	—	7	3
50 to 60 „ - -	—	—	1	1	—	—	1	—	—	—	—	—	2	1
60 to 70 „ -	—	—	1	1	—	—	—	—	—	—	—	—	1	1
70 and over - -	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	34	34	491	249	70	1	59	—	22	—	3	3	679	287

The number of the unvaccinated was 679. [If to these be added those who were "under" vaccination when infected there would be 768 of those attacked with small-pox, or about two-fifths of the whole number who had not been vaccinated previously.] Of the 679 attacked, there were 287 who died, a mortality of 42·2 per cent. [with the larger series of 768 there were 314 deaths, or 40·8 per cent.] The proportion of these "unvaccinated deaths" to the total number (434) would be as 7 to 5, whereas, as above stated, the proportion of *attacks* was as 2 to 5. The comparison would be more just if those under one year of age were excluded, which would give the following figures:—

Aged one year and upwards:—

Attacks.—"unvaccinated" series - - - -	683.
„ "vaccinated" series - - -	1,211.
Deaths.—"unvaccinated" series - - - -	253.
„ "vaccinated" series - - -	120.

or, in round numbers, the attacks amongst the unvaccinated would be to the total as 3 to 8, whilst the deaths would be as 5 to 8.

The great majority of the unvaccinated were children:—

Aged 1 month and under - - -	22	cases,	21 deaths.
„ 1 month to one year - -	53	„	37 „
„ 1 to 10 years - - - -	525	„	195 „
„ 10 to 30 years - - -	57	„	21 „
„ 30 years and over - - -	22	„	20 „

The proportionate severity of attacks, at all ages, was:—

Of malignant attacks - - -	5· per cent.
„ confluent „ - - - -	72·3 „
„ coherent „ - - - -	10·3 „
„ discrete „ - - - -	8·7 „
„ mild „ - - - -	3·2 „
„ indeterminate „ - - - -	0·4 „

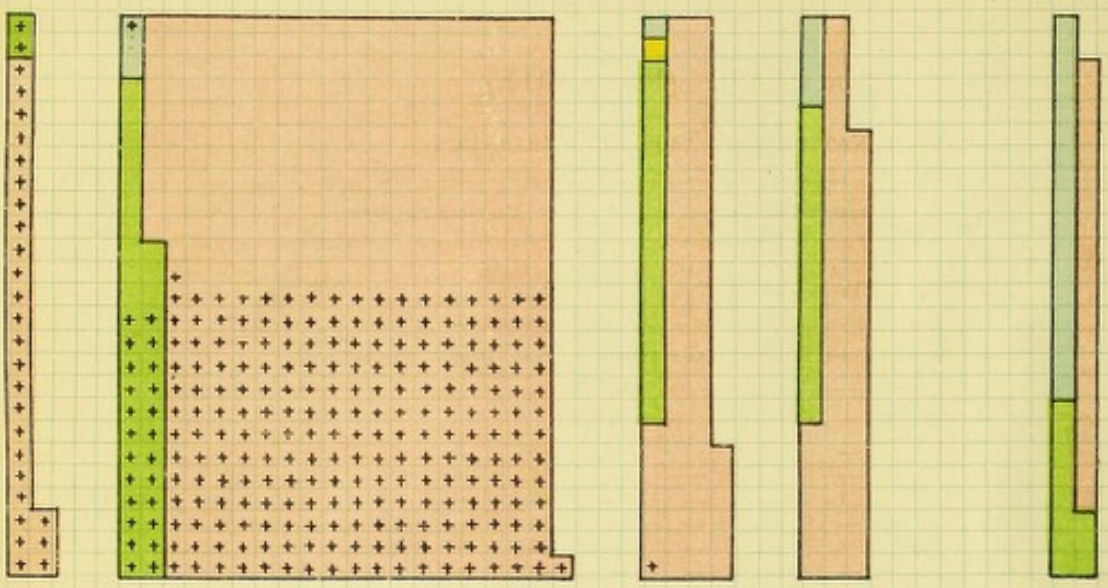
And of the 600 attacks in subjects under 10 years of age, there were:—

Of maligant type - - - - -	4·3 per cent.
„ confluent „ - - - -	72·6 „
„ coherent „ - - - -	10·5 „
„ discrete „ - - - -	8·6 „
„ mild „ - - - -	3·3 „
„ indeterminate type - - -	0·5 „

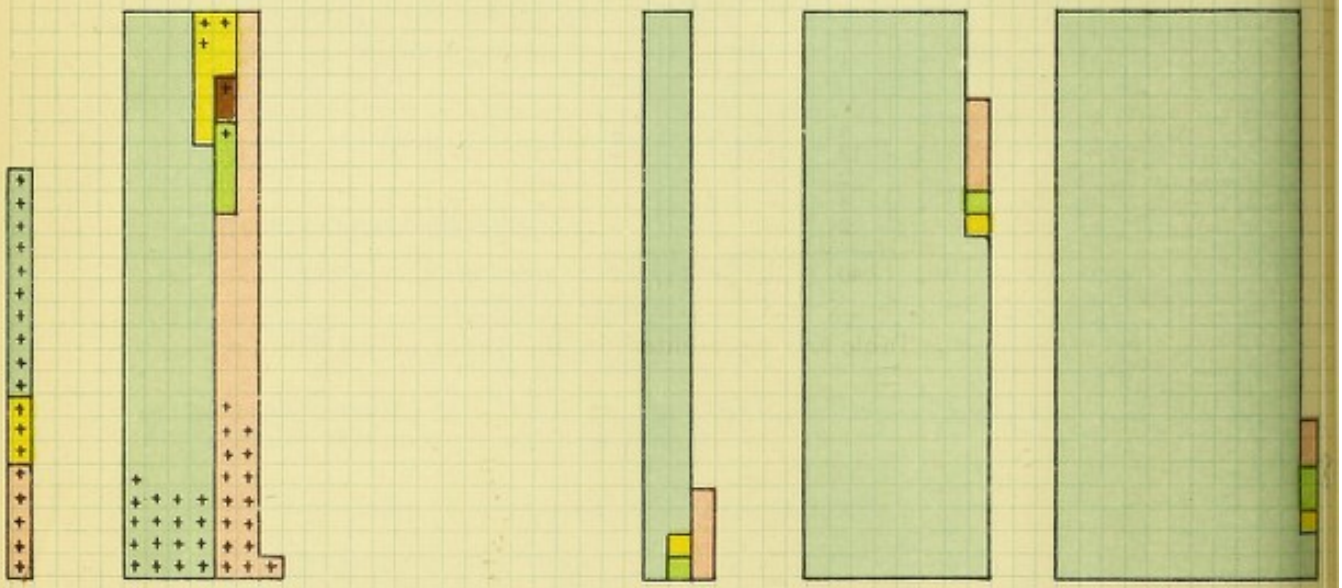
proportions which are closely parallel to those obtaining in the whole series.

TYPES OF SMALL POX ATTACKS, AND FATALITY WITH REGARD TO AGE & VACCINATION.

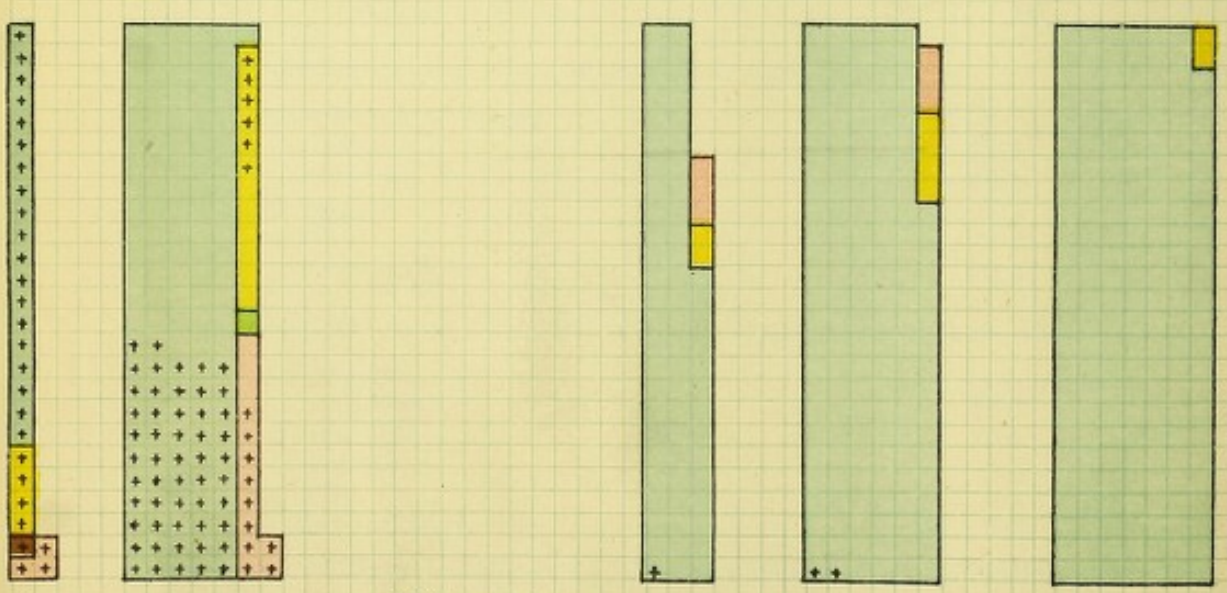
MALIGNANT. CONFLUENT. COHERENT DISCRETE. MILD.



UNDER 10 YEARS.



10 TO 30 YEARS.



30 YEARS & OVER.

Vaccinated.
Alleged Vaccination.
No information.

Under Vaccination.
Unvaccinated.
Fatal Cases.

To face page 153.

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Table XVII. (Plate VIII.)

Vaccination and Type of Small-Pox.

—	Vaccinated Series.						Un-vaccinated Series.				Total	
	Vaccinated.		Alleged Vaccination.		Doubtful Vaccination.		Under Vaccination.		Unvaccinated.		Cases.	Deaths.
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.		
Under 10 years :—												
Malignant -	—	—	—	—	—	—	2	2	26	26	28	28
Confluent - -	3	1	—	—	—	—	37	24	436	223	476	248
Coherent -	1	—	1	—	—	—	16	—	63	1	81	1
Discrete - -	4	—	—	—	—	—	14	—	52	—	70	—
Mild - -	17	—	—	—	—	—	11	—	20	—	48	—
Indeterminate -	—	—	—	—	—	—	—	—	3	3	3	3
10 to 30 years :—												
Malignant -	10	10	3	3	—	—	—	—	5	5	18	18
Confluent - -	94	17	9	3	2	1	4	1	42	16	151	38
Coherent - -	48	—	1	—	—	—	1	—	4	—	54	—
Discrete - -	190	—	1	—	—	—	1	—	4	—	196	—
Mild - -	277	—	1	—	—	—	2	—	2	—	282	—
30 years and over :—												
Malignant -	19	19	4	4	1	1	—	—	3	3	27	27
Confluent - -	126	52	12	6	—	—	1	—	13	10	152	68
Coherent - -	64	1	2	—	—	—	—	—	3	—	69	1
Discrete - -	142	2	4	—	—	—	—	—	3	—	149	2
Mild - -	173	—	2	—	—	—	—	—	—	—	175	—
	1,168	102	40	16	3	2	89	27	679	287	1,979	434

The facts given in this Table are represented in the series of diagrams appended (Plate VIII.).

PART IV.

§ 15. Statistical Analysis of Small-Pox Incidence in 899 households.
Numbers exposed to Infection; of those who were attacked and of those who died.
Size of Households.—Proportionate attack-rates and case-mortality.
Age and Small-Pox Incidence.—Attack-rates.
Vaccination and Small-Pox Incidence.
Attack rates in the "Vaccinated Class" and the "Unvaccinated Class" respectively. ["The "unvaccinated" include those "under vaccination."]
List of Invaded Households, with numbers of inmates, and reference to those attacked, arranged according to their vaccination condition.
Analysis of Attack-rates and Mortality in the Vaccinated and Unvaccinated Series, in relation to (*a.*) Size of Households; (*b.*) Age.
Previous Small-pox.—Numbers of those stated to have had previous attack of small-pox; and the attack-rates after the deduction of these.
§ 16. Hospital Isolation and Vaccination.

§ 15. Statistical Analysis of Small-Pox Incidence in 899 Households.

Information was obtained concerning the ages and vaccination condition of the members of 899 households. The total number of individuals in this community was 4,861, of whom 1,717 were attacked with small-pox, a rate of 35·3 per cent.

Of these 1,717 cases, 370 died, or 21·5 per cent. Thus of all exposed to infection, 7·6 per cent. died from the disease which they contracted.

Size of Households.—The number of members of each household, and the cases of small-pox arising in each are thus distributed :—

	No. of Houses.	No. of Inmates.		Died.
		Exposed.	Attacked.	
Houses with one inmate	2	2	2	—
„ two „	75	150	95	11
„ three „	133	399	178	24
„ four „	142	568	207	37
„ five „	156	780	274	58
„ six „	118	708	221	52
„ seven „	105	735	249	65
„ eight „	73	584	191	49
„ nine „	49	441	134	30
„ ten „	25	250	85	17
„ eleven „	11	121	29	8
„ twelve „	7	84	44	15
„ thirteen „	3	39	8	4
	899	4,861	1,717	370

It will be seen that the incidence of the disease was for the most part inversely to the numbers exposed to infection in each house, but that the mortality was more variable, being highest in the larger households :—

	Attack Rates.	Case Mortality.
	Per Cent.	Per Cent.
In houses with one inmate	100·	—
„ „ two „	63·3	11·5
„ „ three „	44·6	13·4
„ „ four „	36·4	17·8
„ „ five „	35·1	21·1
„ „ six „	31·2	23·5
„ „ seven „	33·8	26·1
„ „ eight „	32·7	25·6
„ „ nine „	30·3	22·3
„ „ ten „	34·	20·
„ „ eleven „	23·9	27·5
„ „ twelve „	52·3	34·1
„ „ thirteen „	20·5	50·

Age and Small-Pox Incidence.

The greater liability to the infection of small-pox amongst children as compared with adults is evidenced from the fact that the incidence on those under 10 years of age (1,603 exposed; 617 attacked) was 38·4 per cent.; and on those above 10 years of age (3,258 exposed; 1,076 attacked) 33 per cent. The divergence is greatest at the two extremes, thus:—

Age.	Exposed.	Attacked.	Rates.
			Per Cent.
1 month and under - -	23	20	87·
1 month to 1 year - -	144	60	41·6
1 to 10 years - -	1,436	561	39·
10 to 30 „ - -	1,751	594	33·9
30 years and over - -	1,507	482	31·9

Vaccination and Small-Pox Incidence.

It remains to determine what influence vaccination apparently had in affording protection from an attack of small-pox.

This question may be approached from many sides, and it of course involves the consideration of the effect of re-vaccination, which was carried on to so large an extent during the progress of the epidemic. Unfortunately the data at my disposal do not afford me sure ground for correct inference on this latter head; for although note was made of every person reported to have been re-vaccinated, there is seldom any qualifying statement as to the success or failure of the vaccination. As we have already seen, a large number of the "re-vaccinated" * who contracted small-pox were individuals in whom the result of this re-vaccination was negative; it left no trace, or such imperfect indication as could not be taken for evidence of a successful vaccination. It would manifestly lead to very wrong conclusions if every individual who did *not* take small-pox, and who was said to have been re-vaccinated, were assumed to have been "successfully" re-vaccinated. I have therefore decided not to deal with this side of the matter at all, but to confine myself to the data obtained as to those who were known to have been vaccinated in infancy, including in the "vaccinated class" those who were alleged to have been vaccinated, but who showed no evidence, and those of whom only doubtful information on the point was afforded.

Again, there is a considerable number (of children chiefly) who were vaccinated either just before small-pox appeared in their families, or on its appearance. These, strictly speaking, form a class apart. They comprise the category of those "under vaccination" when attacked, of whom a list has been given above.

Yet for statistical purposes, in respect to the incidence of the disease amongst members of this class, they will be included with those who remained "unvaccinated" throughout, although I shall also give the statistics of them apart from the truly "unvaccinated."

We have, then, of those exposed to infection in households invaded by small-pox—

Of the "vaccinated class" - - - - - 3,386
„ "unvaccinated class" - - - - 1,475

There were attacked with small-pox—

Of the "vaccinated class" - - 1,028 or 30·3 per cent.
„ "unvaccinated class" - - 689 „ 46·6 „

The "unvaccinated class" includes—

(*a.*) 822 who remained unvaccinated, of whom 604 were attacked.

(*b.*) 653 who were recently vaccinated, of whom 85 were attacked.

So that if this circumstance of recent vaccination be taken into account, the attack rate of the *unvaccinated* would be 73·4 per cent., and of those recently *under vaccination*, 13·0 per cent. This marked divergence can hardly be explained upon any other ground than the new factor, that of recent vaccination, introduced into those of the latter series, as in all other respects, viz., exposure to infection, age, and social status, they were precisely similar to those of the strictly unvaccinated.

* That is of those who were stated to have been re-vaccinated at any time of their lives up to within 14 days of contracting small-pox. (*See* p. 146.)

The following is a list of the invaded households, arranged in the order of their size, the vaccination condition of all the inmates, and then that of those who were attacked with small-pox, these latter being indicated by the numbers in the Case List (*supra*) :—

N.B.—The figures in the "attacked" column refer to the Table of Cases (*supra*). The fatal cases are indicated by thick type. An asterisk (*) denotes a previous attack of small-pox.

House.	All Inmates.			Attacked with Small-Pox.			
	Vaccinated.	Vaccinated at and after Invasion.	Unvaccinated.	Vaccinated.	Alleged Vaccination.	Under Vaccination.	Unvaccinated.
			Houses with One Inmate. (2).				
831	1	—	—	1,450	—	—	—
844	1	—	—	1,474	—	—	—
			Houses with Two Inmates. (75).				
13	2	—	—	16	—	—	—
44	2	—	—	73	—	—	—
124	2	—	—	**172**	—	—	—
193	2	—	—	287	—	—	—
262	2	—	—	392	—	—	—
264	2	—	—	394	—	—	—
267	2	—	—	**397**	—	—	—
292	2	—	—	442	—	—	—
302	2	—	—	460	—	—	—
306	2	—	—	—	**468**	—	—
315	2	—	—	483	—	—	—
339	2	—	—	521	—	—	—
343	2	—	—	531	—	—	—
365	2	—	—	573	—	—	—
377	2	—	—	597	—	—	—
378	2	—	—	—	598	—	—
398	2	—	—	645	—	—	—
399	2	—	—	**646**	—	—	—
414	2	—	—	696	—	—	—
430	2	—	—	748	—	—	—
438	2	—	—	766	—	—	—
442	2	—	—	772	—	—	—
529	2	—	—	942	—	—	—
546	2	—	—	977	—	—	—
594	2	—	—	1,049	—	—	—
596	2	—	—	**1,052**	—	—	—
642	1	—	1	—	—	—	1,135
676	2	—	—	1,186	—	—	—
677	1	—	1	—	—	—	1,187
693	2	—	—	1,211	—	—	—
698	2	—	—	1,217	—	—	—
724	2	—	—	1,264	—	—	—
736	2	—	—	1,281	—	—	—
766	1	—	1	**1,340**	—	—	—
777	2	—	—	1,353	—	—	—
793	2	—	—	1,381	—	—	—
810	2	—	—	1,407	—	—	—
878	2	—	—	1,554	—	—	—
885	2	—	—	1,567	—	—	—
893	2	—	—	1,575	—	—	—
899	2	—	—	1,594	—	—	—
902	2	—	—	1,596	—	—	—
923	2	—	—	1,630	—	—	—
928	2	—	—	1,640	—	—	—
948	2	—	—	1,669	—	—	—
986	2	—	—	**1,757**	—	—	—
1,006	2	—	—	1,809	—	—	—
1,011	2	—	—	1,815	—	—	—
1,018	2	—	—	1,828	—	—	—
1,020	2	—	—	1,830	—	—	—
1,029	2	—	—	1,842	—	—	—
1,050	2	—	—	1,872	—	—	—
1,056	2	—	—	1,886	—	—	—
1,082	2	—	—	1,933	—	—	—
1,090	2	—	—	1,949	—	—	—
60	2	—	—	93, 177	—	—	—

House.	All Inmates.			Attacked with Small-Pox.			
	Vaccinated.	Vaccinated at and after Invasion.	Unvaccinated.	Vaccinated.	Alleged Vaccination.	Under Vaccination.	Unvaccinated.
				Houses with Two Inmates. (75)—continued.			
187	2	—	—	277, 634	—	—	—
317	2	—	—	485, 375	—	—	—
349	2	—	—	545, 903	—	—	—
386	2	—	—	612, 613	—	—	—
482	2	—	—	858, 859	—	—	—
489	2	—	—	872, 1405	—	—	—
573	2	—	—	1,026, 1,463	—	—	—
614	2	—	—	1,077, 1,377	—	—	—
626	2	—	—	1,093, 1,488	—	—	—
640	2	—	—	1,131, 1,132	—	—	—
665	2	—	—	1,167, 1,618	—	—	—
666	2	—	—	1,168, 1,543	—	—	—
686	2	—	—	1,203, 1,590	—	—	—
702	2	—	—	1,221, 1,531	—	—	—
884	2	—	—	1,565, 1,726	—	—	—
933	2	—	—	1,645, 1,697	—	—	—
1,026	2	—	—	1,838, 1,920	—	—	—
1,091	2	—	—	1,950, 1,972	—	—	—
1,099	2	—	—	1,964, 1,979	—	—	—
				Houses with Three Inmates. (133).			
9	3	—	—	11	—	—	—
48	2	—	1	—	—	—	80
128	2	1	—	179	—	—	—
222	2	—	1	—	—	—	334
226	2	—	1	—	—	—	342
233	3	—	—	350	—	—	—
245	2	—	1	370	—	—	—
270	3	—	—	406	—	—	—
309	3	—	—	—	471	—	—
327	2	—	1	—	—	—	502
333	1	1	1*	—	—	508	—
348	3	—	—	546	—	—	—
383	2	1	—	—	—	606	—
390	3	—	—	617	—	—	—
408	2	—	1	—	—	—	681
459	3	—	—	807	—	—	—
469	2	1	—	825	—	—	—
470	3	—	—	834	—	—	—
487	3	—	—	869	—	—	—
491	3	—	—	876	—	—	—
493	2	—	1	—	—	—	879
497	3*	—	—	888	—	—	—
500	3	—	—	904	—	—	—
514	3	—	—	926	—	—	—
523	3	—	—	936	—	—	—
541	3	—	—	970	—	—	—
543	3	—	—	974	—	—	—
549	3	—	—	980	—	—	—
575	1	1	1	—	—	—	1,028
576	3	—	—	1,029	—	—	—
578	3	—	—	1,031	—	—	—
589	3	—	—	1,044	—	—	—
597	3	—	—	1,054	—	—	—
604	2	1	—	1,061	—	—	—
617	2	1	—	1,082	—	—	—
622	3	—	—	1,088	—	—	—
639	2	—	1	—	1,129	—	—
647	3	—	—	1,141	—	—	—
657	3	—	—	1,157	—	—	—
660	2	—	1	—	—	—	1,162
662	2	1	—	1,164	—	—	—
663	3	—	—	1,165	—	—	—
664	3	—	—	1,166	—	—	—
694	2	1	—	1,212	—	—	—
696	3	—	—	1,215	—	—	—
701	3	—	—	1,220	—	—	—
703	2	—	1	1,225	—	—	—
713	3	—	—	1,242	—	—	—

House.	All Inmates.			Attacked with Small-Pox.			
	Vaccinated.	Vaccinated at and after Invasion.	Unvaccinated.	Vaccinated.	Alleged Vaccination.	Under Vaccination.	Unvaccinated.
			Houses with Three Inmates. (133)—continued.				
714	3	—	—	1,243	—	—	—
716	2	—	1	1,245	—	—	—
726	3	—	—	1,267	—	—	—
749	3	—	—	1,308	—	—	—
759	2	1	—	—	—	1,324	—
773	3	—	—	1,349	—	—	—
775	3	—	—	1,351	—	—	—
787	2	1	—	1,370	—	—	—
792	2	1	—	1,380	—	—	—
799	3	—	—	1,389	—	—	—
809	2	—	1	1,406	—	—	—
816	2	—	1	1,417	—	—	—
818	3	—	—	1,419	—	—	—
820	3	—	—	1,424	—	—	—
822	3	—	—	1,429	—	—	—
826	3	—	—	1,441	—	—	—
827	3	—	—	1,443	—	—	—
830	3	—	—	1,449	—	—	—
832	2	1	—	—	—	1,451	—
837	2	1	—	1,460	—	—	—
851	3	—	—	1,486	—	—	—
861	2	—	1	1,505	—	—	—
867	2	1	—	1,529	—	—	—
873	3	—	—	1,545	—	—	—
876	3	—	—	1,549	—	—	—
896	3	—	—	1,591	—	—	—
897	2	—	1*	1,592	—	—	—
909	2	1	—	1,604	—	—	—
919	3	—	—	1,623	—	—	—
974	2	—	1	1,728	—	—	—
978	3	—	—	1,744	—	—	—
981	2	—	1	—	—	—	1,749
982	3	—	—	1,750	—	—	—
984	3	—	—	1,755	—	—	—
994	3	—	—	1,772	—	—	—
1,002	3	—	—	1,792	—	—	—
1,004	2	1	—	—	1,800	—	—
1,007	3	—	—	1,813	—	—	—
1,012	3	—	—	1,816	—	—	—
1,024	3	—	—	1,836	—	—	—
1,032	3	—	—	1,847	—	—	—
1,033	2	—	1	1,848	—	—	—
1,039	3	—	—	1,854	—	—	—
1,051	2	—	1	—	—	—	1,874
1,058	2	—	1*	1,888	—	—	—
1,084	3	—	—	1,936	—	—	—
1,088	3	—	—	1,943	—	—	—
102	1	—	2*	1,214	—	—	148
177	2	—	1	252, 547	—	—	—
223	3	—	—	336, 992	—	—	—
243	2	1	—	367, 690	—	—	—
286	2	—	1	434, 857	—	—	—
288	2*	—	1	436	—	—	1,050
291	3	—	—	443, 765	—	—	—
325	3	—	—	496, 497	—	—	—
344	3	—	—	532, 987	—	—	—
360	3	—	—	565, 797	—	—	—
361	3	—	—	566, 1,065	—	—	—
394	3	—	—	627, 973	—	—	—
436	3	—	—	762, 763	—	—	—
437	3	—	—	764, 1,148	—	—	—
439	2	—	1	767	—	—	1,408
480	2	—	1	1,312	—	—	854
496	2	—	1	887	—	—	1,322
555	2	—	1	988, 1,442	—	—	—
591	2	—	1	1,056	—	—	1,198
605	2	—	1	1,064	—	—	1,062
645	3*	—	—	1,139, 1,577*	—	—	—
654	2	—	1	1,154†	—	—	1,412
734	3	—	—	1,279, 1,616	—	—	—

† No information.

House.	All Inmates.			Attacked with Small-Pox.			
	Vaccinated.	Vaccinated at and after Invasion.	Unvaccinated.	Vaccinated.	Alleged Vaccination.	Under Vaccination.	Unvaccinated.
				Houses with Three Inmates. (133)—continued.			
776	3	—	—	1,352, 1,578	—	—	—
801	2	1	—	1,392	—	1,722	—
804	1	—	2	—	—	—	1,397, 1,635
855	3	—	—	1,495, 1,818	—	—	—
886	3	—	—	1,568, 1,797	—	—	—
985	2	—	1	1,870	—	—	1,756
998	1	1	1	1,878	—	—	1,976
1,009	2	—	1	1,905	—	—	1,802
237	2	—	1	729, 786	—	—	359
250	2	—	1	374, 803	—	—	1,130
320	2	—	1	488, 997	—	—	996
494	2	1	—	885, 1,753	—	1,484	—
536	3	—	—	956, 1,007, 1,305	—	—	—
554	2	—	1	986, 1,534	—	—	1,433
772	2	—	1	1,626, 1,686	—	—	1,348
				Houses with Four Inmates (142).			
18	3	—	1	22	—	—	—
37	2	2	—	54	—	—	—
49	4	—	—	81	—	—	—
52	3*	—	1*	85	—	—	—
57	3	1	—	90	—	—	—
73	4	—	—	111	—	—	—
115	3	—	1	—	—	—	162
154	4	—	—	209	—	—	—
158	3	1	—	214	—	—	—
164	2	—	2	223	—	—	—
166	3	1	—	227	—	—	—
167	3	1	—	228	—	—	—
196	4	—	—	290	—	—	—
201	4	—	—	296	—	—	—
228	2	—	2	344	—	—	—
279	4	—	—	418	—	—	—
287	2	—	2	—	—	—	435
290	4	—	—	441	—	—	—
305	3	—	1	—	—	—	467
312	4	—	—	475	—	—	—
328	2	2	—	503	—	—	—
375	4	—	—	594	—	—	505
330	3	—	1	—	—	—	—
372	3	1	—	—	—	—	—
336	4	—	—	517	—	589	—
381	4	—	—	602	—	—	—
406	4	—	—	675	—	—	—
384	3	1	—	608	—	—	—
419	2	2	—	711	—	—	—
421	4	—	—	713	—	—	—
445	3*	—	1	775	—	—	—
446	1	1	2*	—	—	—	778
448	4	—	—	781	—	—	—
453	2	—	2	788	—	—	—
455	2	2	—	—	800	—	—
457	3	—	1	—	—	—	805
474	3	1	—	844	—	—	—
475	3	1	—	845	—	—	—
477	3	1	—	847	—	—	—
478	4	—	—	849	—	—	—
486	2	2	—	866	—	—	—
507	2	1	1	—	—	—	918
508	3	1	—	—	919	—	—
520	4	—	—	933	—	—	—
528	3	1	—	941	—	—	—
539	4	—	—	962	—	—	—
542	4	—	—	972	—	—	—
563	4	—	—	1,005	—	—	—
564	4	—	—	1,006	—	—	—
568	3	—	1	—	—	—	1,020
571	4	—	—	1,024	—	—	—
579	4	—	—	1,033	—	—	—

House.	All Inmates.			Attacked with Small-Pox.			
	Vaccinated.	Vaccinated at and after Invasion.	Unvaccinated.	Vaccinated.	Alleged Vaccination.	Under Vaccination.	Unvaccinated.
			Houses with Four Inmates. (142)—continued.				
581	4	—	—	1,035	—	—	—
600	3	—	1	1,057	—	—	—
601	4	—	—	—	1,058	—	—
607	3	—	1	1,066	—	—	—
621	3	1	—	—	1,087	—	—
643	2	2	—	1,136	—	—	—
644	4	—	—	1,137	—	—	—
648	4	—	—	1,147	—	—	—
655	2	2	—	1,155	—	—	—
679	2	2	—	—	—	1,191	—
681	3	1	—	1,197	—	—	—
683	2	2	—	1,200	—	—	—
695	4	—	—	1,213	—	—	—
697	2*	2	—	1,216*	—	—	—
707	2	2	—	1,234	—	—	—
711	2	2	—	1,239	—	—	—
729	3	—	1	1,274	—	—	—
780	2	—	2	—	—	—	1,356
782	3	1	—	1,390	—	—	—
783	4	—	—	1,361	—	—	—
815	4	—	—	1,415	—	—	—
819	4	—	—	1,422	—	—	—
821	2	—	2	—	1,427	—	—
824	4	—	—	1,438	—	—	—
825	2	2	—	1,440	—	—	—
848	3	—	1	1,482	—	—	—
874	4	—	—	1,546	—	—	—
881	2	1	1	—	—	—	1,562
907	4	—	—	1,602	—	—	—
911	4	—	—	1,609	—	—	—
918	4	—	—	1,622	—	—	—
949	4	—	—	1,672	—	—	—
972	2	—	2	1,724	—	—	—
979	3	—	1	—	—	—	1,746
1,000	4	—	—	1,790	—	—	—
1,013	3	1	—	1,823	—	—	—
1 017	4	—	—	1,827	—	—	—
1,028	4	—	—	1,841	—	—	—
1,035	2	1	1	1,850	—	—	—
1,044	4	—	—	1,862	—	—	—
1,053	4	—	—	1,881	—	—	—
1,055	4	—	—	1,885	—	—	—
1,059	4	—	—	1,890	—	—	—
1,070	4	—	—	1,914	—	—	—
1,083	4	—	—	1,934	—	—	—
15	1	1	2	—	—	—	19, 53
61	3	—	1	97	—	—	104
66	2	2	—	99, 170	—	—	—
82	2	—	2	—	—	—	121, 232
104	4	—	—	150, 317	—	—	—
215	3	—	1	315, 619	—	—	—
257	2	2	—	385, 1,455	—	—	—
260	4	—	—	768	389	—	—
296	4	—	—	449, 804	—	—	—
370	2	1	1	581	—	—	914
426	3	—	1	742	—	—	1,240
433	4	—	—	756, 961	—	—	—
441	2	2	—	770, 1,376	—	—	—
526	4*	—	—	939, 944	—	—	—
533	4	—	—	947, 1,471	—	—	—
552	2	—	2	—	—	—	984, 1,476
415	3	1	—	1,008, 1,364	—	—	—
646	4	—	—	1,140, 1,192	—	—	—
674	2	—	2	—	—	—	1,182, 1,560
684	4	—	—	1,201, 1,478	—	—	—
715	2	—	2	1,277, 1,878	—	—	1,244, 1,250
732	4	—	—	—	—	—	—
760	2	—	2	—	—	—	1,337, 1,365
812	3	—	1	1,411	—	—	1,561
875	3	—	1	1,708	—	—	1,547

House.	All Inmates.			Attacked with Small-Pox.			
	Vaccinated.	Vaccinated at and after Invasion.	Unvaccinated.	Vaccinated.	Alleged Vaccination.	Under Vaccination.	Unvaccinated.
			Houses with Four Inmates. (142)—continued.				
927	3	1	—	1,638, 1,798	—	—	—
973	2	2	—	1,727, 1,902	—	—	—
977	2	1	1	1,738	—	—	1,817
83	2	1	1	216	—	217	122
112	2	1	1	160, 210	—	—	196
225	2	1	1	338, 707	—	—	706
235	3	—	1	637, 638	—	—	357
362	3	—	1	964, 1,342	—	—	568
412	4	—	—	682, 688, 1,069	—	—	—
443	2	—	2	773	—	—	1,260, 1,261
451	2	1	1	1,098	—	1,825	785
548	2	—	2	1,428	—	—	1,292, 1,468
612	2	—	2	1,073	—	—	1,522, 1,523
721	3	—	1	1,258, 1,430	—	—	1,489
752	3	1	—	1,551, 1,650	—	1,314	—
857	3	—	1	1,559, 1,717	—	—	1,496
944	3	—	1	1,360, 1,662	—	—	1,768
47	2	—	2	78, 127	—	—	102, 108
192	3	—	1	285, 1,126, 1,539	—	—	1,525
299	1	—	3	451	—	—	455, 456, 457
			Houses with Five Inmates. (156.)				
3	5	—	—	3	—	—	—
92	5	—	—	136	—	—	—
95	2	—	3	—	—	—	138
100	3	—	2	—	—	—	146
114	2	2	1	—	—	—	161
134	3*	1	1*	187	—	—	—
139	2	2	1	—	—	—	192
141	2	—	3	—	—	—	197
169	3	1	1	—	—	—	233
190	5	—	—	281	—	—	—
212	5	—	—	311	—	—	—
224	5	—	—	337	—	—	—
230	4	—	1*	347	—	—	—
234	5	—	—	356	—	—	—
238	3	2	—	360	—	—	—
247	5	—	—	371	—	—	—
255	4	1	—	381	—	—	—
277	2	3	—	416	—	—	—
311	4	1	—	474	—	—	—
331	2	2	—	—	—	—	506
335	4	—	1	—	—	—	516
347	4	1	—	—	544	—	—
374	1	3	1	—	—	—	592
380	4	—	1	—	—	—	601
382	4	—	1	—	—	—	604
387	5	—	—	614	—	—	—
424	5	—	—	739	—	—	—
440	4	—	1*	769	—	—	—
449	2	2	1	—	—	—	783
461	3	2	—	809	—	—	—
509	4	1	—	921	—	—	—
512	5	—	—	924	—	—	—
515	5	—	—	927	—	—	—
521	5	—	—	934	—	—	—
556	2*	3	—	989	—	—	—
562	5*	—	—	—	1,001*	—	—
615	5	—	—	1,081	—	—	—
619	5	—	—	—	1,084	—	—
624	4	1	—	1,091	—	—	—
629	5	—	—	1,100	—	—	—
638	5	—	—	—	1,125	—	—
650	1	3	1	—	—	—	1,149
656	3	1	1	—	—	—	1,156
668	5	—	—	1,172	—	—	—
670	4	1	—	1,177	—	—	—
700	4	—	1	—	—	—	1,219
705	3*	2	—	1,230	—	—	—

House.	All Inmates.			Attacked with Small-Pox.			
	Vaccinated.	Vaccinated at and after Invasion.	Unvaccinated.	Vaccinated.	Alleged Vaccination.	Under Vaccination.	Unvaccinated.
			Houses with Five Inmates. (156)—continued.				
710	5	—	—	1,238	—	—	—
717	5	—	—	1,248	—	—	—
731	2	2	1	—	—	—	1,276
737	2	3	—	1,282	—	—	—
742	3	2	—	1,296	—	—	—
747	3	1	1	—	—	—	1,304
748	5	—	—	1,307	—	—	—
750	4	—	1	1,311	—	—	—
756	5	—	—	1,319	—	—	—
704	5	—	—	1,320	—	—	—
757	2	3	—	1,321	—	—	—
764	3	2	—	—	—	1,338	—
765	4	1	—	1,339	—	—	—
774	4	—	1	—	—	—	1,350
797	5	—	—	1,387	—	—	—
798	4	1	—	1,388	—	—	—
800	5	—	—	1,391	—	—	—
806	3	2	—	—	1,402	—	—
836	5	—	—	1,459	—	—	—
839	3	2	—	1,462	—	—	—
846	4*	1	—	1,480	—	—	—
853	2	3	—	1,490	—	—	—
869	2	3	—	—	—	1,536	—
880	2	1	2	—	—	—	1,558
920	2	3	—	1,625	—	—	—
930	5	—	—	1,642	—	—	—
943	4	—	1	—	—	—	1,659
946	2	3	—	1,664	—	—	—
953	3	2	—	1,679	—	—	—
954	4	—	1	1,680	—	—	—
959	5	—	—	1,691	—	—	—
961	5	—	—	1,696	—	—	—
976	1	3	1	—	—	—	1,734
988	3	2	—	1,759	—	—	—
989	4	—	1	—	—	—	1,761
1,003	5	—	—	1,799	—	—	—
1,041	4	1	—	1,856	—	—	—
1,048	2	2	1	1,866	—	—	—
1,063	5	—	—	1,894	—	—	—
1,076	2*	—	3	—	—	—	1,926
1,097	5	—	—	1,960	—	—	—
16	2	—	3	20	—	—	44
40	4	1	—	59, 77	—	—	—
77	2	2	1	238	—	—	116
147	3	—	2	—	—	—	202, 430
186	1	—	4	633	—	—	276
209	4	—	1	307	—	—	306
213	2	2	1	312	—	—	428
216	3	—	2	—	—	—	316, 648
229	5	—	—	345, 699	—	—	—
232	3	—	2	349	—	—	607
241	3	2	—	363	—	1,656	—
242	2	2	1	662	—	—	366
248	2	2	1	372	—	—	780
249	3	2	—	373, 1,929	—	—	—
268	5	—	—	399, 402	—	—	—
274	5	—	—	410, 754	—	—	—
285	5	—	—	433, 915	—	—	—
393	5	—	—	626, 1,958	—	—	—
462	5*	—	—	810, 1,004	—	—	—
472	2	—	3	—	—	—	838, 839
547	4	1	—	978, 1,310	—	—	—
574	5	—	—	1,027, 1,541	—	—	—
587	2	2	1	1,733	—	—	1,042
599	4	—	1	1,957	—	—	1,056
611	5	—	—	1,071, 1,072	—	—	—
630	1	—	4	1,112	—	—	1,530
641	5	—	—	1,133, 1,134	—	—	—
671	4	—	1	1,533	—	—	1,179
744	4	—	1	1,601	—	—	1,300

House.	All Inmates.			Attacked with Small-Pox.			
	Vaccinated.	Vaccinated at and after Invasion.	Unvaccinated.	Vaccinated.	Alleged Vaccination.	Under Vaccination.	Unvaccinated.
			Houses with Five Inmates. (156)—continued.				
790	2	3	—	1,621	—	1,375	—
828	5	—	—	1,444, 1,709	—	—	—
868	3	—	2	—	—	—	1,535, 1,740
877	5	—	—	1,550, 1,748	—	—	—
916	3	—	2	1,783	—	—	1,619
955	5	—	—	1,687, 1,810	—	—	—
1,042	5	—	—	1,859, 1,925	—	—	—
54	4	—	1	140, 141	—	—	87
65	4	—	1	175, 386	—	—	98
89	3	—	2	247	—	—	131, 133
108	2	2	1	283, 1,956	—	—	155
148	4	—	1	203, 481	—	—	971
149	3	1	1	422, 423	—	—	204
218	5	—	—	326, 579, 580	—	—	—
293	4	—	1	444, 728	—	—	731
342	4	—	1	842, 1,369	—	—	529
357	3*	1	1	560, 1,540	—	—	883
371	4	1	—	677, 733, 1,249	—	—	—
410	4	—	1	1,145, 1,266	—	—	684
527	2	2	1	940	—	1,587	1,223
537	2	—	2	956	—	—	957, 1,323
608	3	1	1	1,067	—	1,254	1,097
690	3	—	1	1,207, 1,695	—	—	1,821
767	2	—	3	1,341	1,661	—	1,735
842	4	—	1	1,470, 1,725, 1,741	—	—	—
937	3	—	2	1,652	—	—	1,871, 1,938
69	2	—	3	143	—	—	105, 106, 115
117	3	—	2	582	243	—	164, 583
239	4*	—	1	361, 725, 727	—	—	802
252	3	—	2	605, 708	—	—	376, 697
266	2*	—	3	716	—	—	396, 718, 719
281	3	—	2	420, 674	—	—	734, 799
337	1	3	1	—	—	868, 871, 1,089	518
862	2	2	1	1,508, 1,712	—	1,586	1,730
189	2	—	3	513	512	—	280, 511, 515
307	3	—	2	469, 852, 913	—	—	751, 1,002
395	1	—	4	660	—	—	630, 655, 657, 659
401	3	—	2	653, 678, 723	—	—	722, 724
502	1	—	4	1,109	—	—	909, 982, 1,108 1,401
			Houses with Six Inmates. (118.)				
25	4	2	—	33	—	—	—
33	5	—	1*	—	—	—	49*
45	5	1	—	74	—	—	—
50	5*	—	1*	82	—	—	—
68	3	3	—	103	—	—	—
70	2	3	1	—	—	—	107
84	2	—	4	—	—	—	123
85	4	1	1	—	—	—	124
86	4	—	2	—	—	—	125
91	2	3	1	—	—	—	134
103	3	—	3	149	—	—	—
137	3	2	1	—	—	—	190
173	3	2	1	—	—	—	248
175	2	3	1	—	—	—	250
179	4	2	—	254	—	—	—
191	4	2	—	282	—	—	—
231	6	—	—	348	—	—	—
278	4	1	1	—	—	—	417
314	2	3	1	—	—	—	482
350	5	—	1	548	—	—	—
363	6	—	—	569	—	—	—
416	3	2	1	—	—	—	702
422	5	1	—	730	—	—	—
490	4	1	1	—	—	—	875
492	5	—	1	—	—	—	878
495	5	—	1	—	—	—	886

House.	All Inmates.			Attacked with Small-Pox.			
	Vaccinated.	Vaccinated at and after Invasion.	Unvaccinated.	Vaccinated.	Alleged Vaccination.	Under Vaccination.	Unvaccinated.
			Houses with Six Inmates. (118)—continued.				
501	3	2	1	—	—	—	890
517	2	—	4	929	—	—	—
525	3*	2	1	—	—	—	938
545	6	—	—	976	—	—	—
550	6	—	—	981	—	—	—
551	3	2	1	—	—	—	983
559	6	—	—	995	—	—	—
588	5	—	1	1,043	—	—	—
595	2	2	2	—	—	—	1,051
618	3	2	1	1,083	—	—	—
625	3*	—	3*	1,092	—	—	—
631	5	1	—	1,113	—	—	—
651	5	1	—	1,150	—	—	—
658	6	—	—	—	1,158	—	—
661	5	1	—	1,163	—	—	—
680	2	3	1	—	—	1,196	—
691	2	3	1	1,208	—	—	—
733	2	4	—	1,278	—	—	—
738	6	—	—	1,284	—	—	—
754	6	—	—	1,317	—	—	—
758	6	—	—	1,323	—	—	—
769	6	—	—	1,345	—	—	—
771	5	1	—	1,347	—	—	—
781	3	2	1	—	—	—	1,359
803	6	—	—	1,396	—	—	—
847	5	1	—	1,481	—	—	—
864	4	—	2	1,526	—	—	—
883	2	4	—	1,564	—	—	—
890	4	2	—	1,572	—	—	—
931	5	—	1	1,643	—	—	—
941	3	2	1	—	—	—	1,657
966	6	—	—	1,715	—	—	—
990	3*	2	1	—	—	—	1,763
1,061	6	—	—	1,892	—	—	—
1,066	5*	—	1	—	—	—	1,900
1,078	6	—	—	1,962	—	—	—
1,093	6	—	—	1,952	—	—	—
17	5*	—	1	21, 28	—	—	—
81	1	—	5*	—	—	—	120, 1,845
132	2	—	4	—	—	—	185, 318
163	2	2	2	—	—	—	221, 222
172	6	—	—	244, 472	—	—	—
203	2	4	—	298	—	695	—
253	2	3	1	377	—	—	670
271	3	2	1	686	—	—	407
364	6	—	—	572, 1,765	—	—	—
428	6	—	—	745, 1,472	—	—	—
450	4	2	—	784, 1,358	—	—	—
455	4	—	2	—	—	—	795, 798
476	4	1	1	1,032	—	—	846
513	4	1	1	—	—	1,386	925
561	2	3	1	—	—	1,000	999
586	4	1	1	1,041	—	1,399	—
673	5	—	1	1,499	—	—	1,181
704	3	2	1	1,288, 1,812	—	—	—
720	5	1	—	1,357, 1,425	—	—	—
745	3	2	1	1,302	—	—	1,579
768	6	—	—	1,343, 1,344	—	—	—
786	3	—	3	—	—	—	1,366, 1,632
795	3	2	1	1,383	—	—	1,384
808	2	3	1	1,655	—	—	1,404
887	5	1	—	1,569, 1,628	—	—	—
934	3	2	1	1,785	—	—	1,646
971	3	—	3	—	—	—	1,723, 1,840
987	4	—	2	—	—	—	1,758, 1,867
999	5	—	1	1,876	—	—	1,789
29	4	1	1	41, 61	—	—	42
31	2	—	4	—	—	—	46, 47, 51
106	4	—	2	274	—	—	153, 284
119	2	2	2	286, 584	—	—	166

House.	All Inmates.			Attacked with Small Pox.			
	Vaccinated.	Vaccinated at and after Invasion.	Unvaccinated.	Vaccinated.	Alleged Vaccination.	Under Vaccination.	Unvaccinated.
				Houses with Six Inmates. (118)—continued.			
275	3	1	2	—	—	793	411, 543
304	4	—	2	465, 710	—	—	654
429	4*	—	2	1,146	—	—	746, 1,282
510	4	1	1	922	—	1,780	1,566
538	4	2	—	967, 968, 1,301	—	—	—
557	2	3	1	1,371	—	1,330	990
570	6*	—	—	1,022, 1,447, 1,448	—	—	—
672	1	3*	2	1,580	—	—	1,180, 1,654
719	4	1	1	1,256	1,227	—	1,298
963	5	—	1	1,703, 1,873	—	—	1,812
405	4	1	1	1,110, 1,117, 1,326	—	—	668
466	4	—	2	1,271, 1,581	—	—	814. 1,582
499	2	—	4	1,023	—	—	899, 959, 960
584	6	—	—	1,038, 1,039, 1,469, 1,710	—	—	—
904	2	—	4	—	—	—	1,598, 1,782, 1,857, 1,858
21	2	—	4	39	—	—	25, 34, 35, 36
265	3	1	2	720, 822	—	823	395, 717
301	4	—	2	738, 776, 796	—	—	459, 777
338	4	1	1	520, 835, 1,368	—	1,367	1,498
170	1	—	5	464	—	—	237, 462, 463, 721, 758
316	3	1	2	649, 650, 830	—	829	484, 642
432	2	—	4	755, 1,101	—	—	1,102, 1,103, 1,104 1,105
				Houses with Seven Inmates. (105.)			
26	5	—	2	37	—	—	—
72	7	—	—	110	—	—	—
75	2	—	5	—	—	—	113
144	5	—	2	—	—	—	198
157	6	1	—	213	—	—	—
174	3	3	1	—	—	—	249
178	5	2	—	253	—	—	—
198	3	3	1	—	—	—	293
210	4*	2	1	—	—	—	308
273	3	4	—	409	—	—	—
319	6*	—	1	—	—	—	487
329	5	2	—	504	—	—	—
345	5	—	2	—	—	—	533
352	7	—	—	551	—	—	—
385	7	—	—	615	—	—	—
431	4	3	—	—	—	753	—
456	3	3	1	—	—	—	801
458	7	—	—	806	—	—	—
503	4	3	—	910	—	—	—
504	2	4	1	—	—	—	908
516	3	3	1	928	—	—	—
534	2	4	1*	948	—	—	—
540	5	—	2	—	969	—	—
912	5	2	—	771	—	—	—
582	7	—	—	1,036	—	—	—
590	7	—	—	1,045	—	—	—
620	7	—	—	1,085	—	—	—
623	6*	1	—	1,090	—	—	—
636	4	2	1	—	—	—	1,122
688	4*	3	—	1,205	—	—	—
709	6	—	1	—	—	—	1,237
763	2	5	—	—	—	1,337	—
796	5	2	—	1,385	—	—	—
802	4	3	—	1,395	—	—	—
840	6	1	—	—	—	1,465	—
841	4	3	—	1,467	—	—	—
888	3*	3	1	—	—	—	1,570
900	4	3	—	—	—	1,585	—
906	6	—	1	—	—	—	1,600
910	4	2	1	1,608	—	—	—
922	7*	—	—	1,629	—	—	—
967	4*	3	—	1,716	—	—	—

House.	All Inmates.			Attacked with Small-Pox.			
	Vaccinated.	Vaccinated at and after Invasion.	Unvaccinated.	Vaccinated.	Alleged Vaccination.	Under Vaccination.	Unvaccinated.
			Houses with Seven Inmates. (105)—continued.				
1,014	7	—	—	1,824	—	—	—
1,034	7	—	—	1,849	—	—	—
1,052	7	—	—	1,880	—	—	—
1,089	7	—	—	1,944	—	—	—
1,098	4	2	1	—	—	—	1,961
39	4**	1	2	—	—	—	58, 75
78	3	—	4	—	—	—	117, 224
120	4	—	3	278	—	—	167
295	7	—	—	447, 1,233	—	—	—
403	2	3	2	—	—	—	663, 664
468	7	—	—	821, 1,436	—	—	—
473	1	—	6	—	—	—	841, 905
506	3	—	4	1,439	907	—	—
518	4	—	3	—	—	—	930, 1,291
535	1	5	1	—	—	1,426	949
567	2	2	3	1,018	—	—	1,019
569	4	1	2	1,713	—	—	1,021
580	6	1	—	1,034, 1,086	—	—	—
616	7*	—	—	1,096, 1,649	—	—	—
667	7*	—	—	1,306	1,170	—	—
725	4*	3	—	1,265	—	1,611	—
794	4*	3	—	1,382	—	1,423	—
908	5	2	—	1,603, 1,721	—	—	—
938	2	3	2	—	—	—	1,653, 1,781
950	6	1	—	1,673, 1,801	—	—	—
118	4	—	3	—	414	—	165, 415
165	4	—	3	—	—	—	225, 226, 528
181	4	1	2	—	—	553	269, 1,169
322	5	1	1	490	—	321	744
376	4	2	1	595, 911	—	—	596
427	4	2	1	1,194, 1,294	—	—	743
566	4	—	3	1,491	—	—	1,016, 1,409
652	6	1	—	1,152, 1,263, 1,660	—	—	—
814	2	5	—	1,903	—	1,414, 1,743	—
817	2	4	1	1,520	—	1,521	1,418
1,049	7	—	—	1,869, 1,882, 1883	—	—	—
34	3	1	3	—	—	70	57, 68, 69
58	2	—	5	91, 322	—	—	180, 184
107	3	3	1	154, 1,584	—	1,739	1,555
116	5	—	2	576, 737	—	—	163, 575
161	3	1	3	—	—	698	219, 953, 954
220	4	2	1	332, 898	—	1,195	1,013
294	6	—	1	714, 759, 1,251	—	—	445
297	2	3	2	752	—	916	450, 955
417	4	—	3	1,138	—	—	704, 1,003, 1,372
425	5	1	1	1,178, 1,235, 1,332	—	—	740
519	3	—	4	—	—	—	931, 1,393, 1,394 1,432
850	5	1	1	1,953, 1,971, 1,978	—	—	1,485
865	5	—	2	1,714, 1,736	1,527	—	1,528
143	4	—	3	378, 1,121	—	—	195, 380, 382
280	7	—	—	419, 652, 661, 749, 750	—	—	—
324	3	—	4	893	—	—	495, 892, 894, 1,123
332	2	—	5	—	—	—	507, 760, 900, 901, 902
397	4	—	3	641, 832	—	—	640, 736, 833
420	4	2	1	1,053, 1,524	1,151	1,159	712
434	5	—	2	757, 1,143, 1,144	—	—	1,287, 1,288
632	2	2	3	—	—	1,446, 1,501	1,114, 1,222, 1,500
924	4	—	3	1,631, 1,634	—	—	1,786, 1,787, 1,788
246	7	—	—	369, 600, 628, 629, 631, 741	—	—	—
389	5	1	1	616, 867, 964, 965	—	963	618
391	3	3	1	622, 951	—	952, 1,009, 1,010	623
136	2	—	5	325, 400	—	—	189, 323, 324, 327, 401
244	2	—	5	530, 701	—	—	368, 524, 525, 526, 527

House.	All Inmates.			Attacked with Small-Pox.			
	Vaccinated.	Vaccinated at and after Invasion.	Unvaccinated.	Vaccinated.	Alleged Vaccination.	Under Vaccination.	Unvaccinated.
			Houses with Eight Inmates. (73.)				
12	8*	—	—	15	—	—	—
88	7	—	1	—	—	—	130
111	3	2	3	—	—	—	158
127	5	—	3	—	—	—	**178**
160	5	—	3	—	—	—	218
199	8	—	—	294	—	—	—
202	7	1	—	297	—	—	—
258	4*	4	—	387	—	—	—
353	8	—	—	552	—	—	—
373	8	—	—	593	—	—	—
392	6	1	1	—	—	—	625
435	7	1	—	761	—	—	—
484	6	1	1	—	—	—	865
511	6	—	2	—	—	—	923
592	4	4	—	1,047	—	—	—
593	8*	—	—	1,048	—	—	—
598	7	—	1	1,055	—	—	—
606	6	—	2	—	—	—	1,063
627	7*	1	—	1,095	—	—	—
635	4	—	4	1,120	—	—	—
675	4	3	1	—	—	1,183	—
708	5	3	—	1,236	—	—	—
829	4	2	2	—	—	—	1,445
852	8	—	—	1,487	—	—	—
942	8	—	—	1,658	—	—	—
956	7*	1	—	—	—	1,688	—
1,001	5	2	1	1,791	—	—	—
1,019	4	4	—	1,829	—	—	—
1,067	2	5	1	—	—	—	1,901
30	5	—	3	45	—	—	71
32	6	—	2	—	—	—	48, 50
90	6	—	2	267	—	—	132
97	6	—	2	—	—	—	142, 341
138	3	4	1	390	—	—	191
256	3	4	1	398	—	—	383
269	4	4	—	404, 667	—	—	—
366	4	3	1	958	—	—	574
723	5	—	3	—	—	—	1,262, 1,466
854	3	3	2	—	—	—	1,493, 1,509
947	5	2	1	1,793	—	—	1,666
952	8	—	—	1,677, 1,787	—	—	—
969	6	2	—	1,839	—	1,719	—
1,023	7	—	1	1,922	—	—	1,835
41	7	—	1	60, 84, 1,977	—	—	—
150	5	—	3	—	—	—	205, 478, 514
159	5	—	3	499	—	—	215, 498
221	2	6	—	333, 861	—	860	—
577	7	—	1	1,477, 1,651	—	—	1,030
585	7	1	—	1,040, 1,435	—	1,702	—
992	4	2	2	1,910	—	—	1,767, 1,868
996	7	—	1	1,776, 1,796	—	—	1,808
1,025	7	—	1*	1,837, 1,916, 1,963	—	—	—
99	6	—	2	246, 351	—	—	145, 245
101	3	3	2	—	—	262, 263	147, 261
318	2	3	3	848, 850	—	851	486
369	4	—	4	578, 882, 1,079	—	—	1,080
722	6	—	2	1,259, 1,552	—	—	1,553, 1,705
895	4	—	4	—	—	—	1,583, 1,613, 1,683, 1,742
964	4	1	3	1,877	—	—	1,706, 1,811, 1,812
67	4	—	4	100	—	—	352, 353, 405, 656
122	5	1	2	169, 556, 557	—	—	273, 555
146	5	1	2	319, 437	—	673	200, 355
358	3	4	1	906	—	815, 837, 884	562
407	5	—	3	679, 1,315	—	—	794, 826, 1,269
805	4	3	1	1,605, 1,769	—	1,636, 1,685	1,398
64	4	—	4	494, 501	—	—	96, 492, 493, 1,094
289	3	—	5	896	—	—	438, 891, 895, 897, 920
356	4	—	4	588, 621	—	—	559, 561, 563, 819

House.	All Inmates.			Attacked with Small-Pox.			
	Vaccinated.	Vaccinated at and after Invasion.	Unvaccinated.	Vaccinated.	Alleged Vaccination.	Under Vaccination.	Unvaccinated.
				Houses with Eight Inmates. (73)--continued.			
444	6	1	1	536, 840, 917, 1,226, 1,227	—	**774**	—
464	3	2	3	1,289	—	1,176, 1,290	812, **843**, 1,175
565	8	—	—	1,011, 1,012, 1,017, 1,106, 1,107, 1,762	—	—	—
1,046	3	—	5	—	1,864	—	1,899, 1,928, 1,935, 1,937, 1,940
498	4	—	4	388, 889, 1,421	—	—	1,518, **1,751**, **1,752**, **1,678**
				Houses with Nine Inmates. (49.)			
27	5*	—	4	—	—	—	38
71	7	—	2	—	—	—	**109**
162	3	4	2*	—	—	—	220
176	7	2	—	251	—	—	—
310	6	3	—	473	—	—	—
402	9*	—	—	658	—	—	—
483	7	2	—	—	—	864	—
553	6	2	1	—	—	—	985
603	5	—	4	1,060	—	—	—
610	4	5	—	1,070	—	—	—
637	6	3	—	1,124	—	—	—
682	9	—	—	1,199	—	—	—
743	6	3	—	1,299	—	—	—
755	8	1	—	1,318	—	—	—
791	7	2	—	1,378	—	—	—
811	9	—	—	—	1,410	—	—
879	4	5	—	—	1,557	—	—
882	9	—	—	1,563	—	—	—
993	9	—	—	1,771	—	—	—
35	8	—	1	52	—	—	79
105	5	2	2	—	—	—	**151**, 152
110	8	—	1	303	—	—	157
156	5	3	1	**403**	—	—	**212**
168	5	—	4	**446**	—	—	229
184	5	3	1	**272**	—	—	448
479	9	—	—	853, 1,273	—	—	—
687	7	2	—	**1,204**, 1,538	—	—	—
76	8	—	1	231, **239**	—	—	**114**
447	5	—	4	779, 1,846, 1,919	—	—	—
485	3*	—	6*	1,115	—	—	870, 1,116
572	6	2	1	1,025, 1,453	—	—	**1,454**
634	7*	—	2	1,119, 1,889	—	—	1,589
692	7	—	2	1,209, 1,420	—	—	1,210
728	7**	—	2**	1,272, 1,437, **1,681**	—	—	—
649	5*	4	—	1,400, 1,639, 1,775	—	—	—
1,005	6	—	3	—	—	—	817, 1,374, 1,606
142	6	—	3	340, 354, 791	—	—	**194**
313	4	2	3	1,519	—	—	**477**, **676**, 1,193
761	6	1	2	1,335	—	1,494	1,333, 1,334
96	5	—	4*	567, 991	—	—	**139**, 230, 993
123	5	—	4	873, 874	—	—	171, 440, 747
276	9	—	—	412, 671, 1,127, 1,253, 1,607	—	—	—
452	6	—	3	789, 831	—	—	787, 790, 792
739	6**	—	3	1,434, 1,506	—	—	979, **1,286**, 1,507
965	5	—	4	1,803	—	—	1,711, **1,804**, 1,805, 1,807
151	4	—	5	**310**, **339**	—	—	**206**, **335**, 424, **425**, **426**
409	5	—	4	692, 1,111, 1,185	—	—	683, 1,184, 1,270, **1,331**
251	6	—	3	375, 818, 824, 862, 1,246	—	—	1,189, 1,190, **1,329**
1,064	4	—	5	1,907, 1,908, 1,909	—	—	1,895, **1,897**, **1,898**, **1,906**, 1,912

House.	All Inmates.			Attacked with Small-Pox.			
	Vaccinated.	Vaccinated at and after Invasion.	Unvaccinated.	Vaccinated.	Alleged Vaccination.	Under Vaccination.	Unvaccinated.
				Houses with Ten Inmates. (25.)			
43	6	—	4	72	—	—	—
63	7	2	1	—	—	—	95
188	10	—	—	279	—	—	—
388	7	—	3	615	—	—	—
505	7	2	1	—	—	—	912
751	7	2	1	1,313	—	—	—
785	8	2	—	1,363	—	—	—
995	9	—	1	1,774	—	—	—
741	6	4	—	1,295, 1,588	—	—	—
753	8*	2	—	1,316	1,475	—	—
856	4	5	1	1,655	—	—	1,497
863	5	2	3	—	—	—	1,510, 1,548
970	9	—	1	1,720	—	—	**1,773**
109	7*	—	3	—	—	—	**156, 255, 256**
171	5	3	2	480	—	—	240, 856
341	9	—	1	523, 1,078	—	—	1,014
8	8	—	2	9, 12	—	—	**8**, 10
195	2	5	3	—	—	624, **665**	289, 534, 666
932	8	—	2	1,644, 1,779, 1,806	—	—	1,674, 1,745
113	6	—	4	**291**, 644	—	—	**159**, 466, 479, **643**
1,021	6	2	2	1,947, 1,948	—	**1,831**, 1,832	1,833, 1,946
400	7	1	2	651, 1,174, 1,285, 1,517	—	1,173	1,515, 1,516
56	3	—	7	330	—	—	**89, 173, 101**, 1,416 1,670, **1,671**, 1,704
140	4	—	6	365, 384	—	—	**193**, 364, 413, **693**, 694, 1,161
194	5	—	5	540, 541, 542, 585	—	—	**288, 537, 538, 539, 669**
				Houses with Eleven Inmates. (11.)			
204	10	1	—	299	—	—	—
321	6	3	2	—	—	—	489
413	8	3	—	691	—	—	—
602	7*	2	2	—	—	—	**1,059**
1,016	10	—	1	1,826	—	—	—
712	7	4	—	1,241, 1,379	—	—	—
823	6	5	—	1,692	—	1,431	—
1,038	11	—	—	1,853, 1,861	—	—	—
152	7	—	4	421, 439	—	—	**207**
633	7	2	2	1,118, 1,610	—	—	**509, 1,224**
94	7	—	4	235, 259, 260, 265, 236, 266, 268	—	—	**135, 234, 314, 429**
				Houses with Twelve Inmates. (7.)			
411	7	—	5	—	—	—	**685, 689**
87	7	—	5	1,128	—	—	128, 129, 647
303	8	—	4	—	—	—	461, **880, 881**, 932
182	8	—	4	270, 571	—	—	580, 700, **715, 828**
560	7	—	5	1,075	998	—	**1,015, 1,076**, 1,171, 1,513, **1,514**
678	5	1	6	1,512, 1,701, 1,913	—	—	**1,188, 1,492**, 1,511, 1,698, **1,699, 1,700**
272	8	2	2	**408**, 586, 609, 632, 687, 709, 726	587	635, 636	**590, 610**
				Houses with Thirteen Inmates. (3.)			
282	5	8	—	427	—	—	—
145	8	5	—	199	—	**201**	—
125	6	3	4	—	—	827	**174, 820**, 1,142, **1,247**

The analysis of this table shows the following to be the incidence and fatality of small-pox in households of various sizes :—

No. of Inmates.	"Vaccinated" Class.			Attack Rate.	Fatality.	"Unvaccinated" Class.			Attack Rate.	Fatality.
	Exposed.	Attacked.	Died.			Exposed.	Attacked.	Died.		
				Per Cent.	Per Cent.				Per Cent.	Per Cent.
One - -	2	2	—	100·0	—	—	—	—	—	—
Two - -	147	93	11	63·2	11·8	3	2	—	66·6	—
Three - -	334	144	10	43·1	6·9	65	34	14	52·3	41·1
Four - -	433	152	21	35·1	13·8	135	55	16	40·7	29·1
Five - -	548	170	13	31·0	7·6	232	104	45	44·8	43·2
Six - -	455	114	7	25·0	6·1	253	107	45	42·2	42·0
Seven - -	463	121	17	26·1	14·0	272	128	48	47·0	37·5
Eight - -	383	87	5	22·7	5·7	201	104	44	51·7	42·3
Nine - -	303	73	9	24·0	12·3	138	61	21	44·2	34·4
Ten - -	163	35	1	21·4	2·8	87	50	16	57·4	32·0
Eleven - -	86	19	—	22·0	—	35	10	8	28·5	80·0
Twelve - -	50	16	1	32·0	6·2	34	28	14	82·3	50.0
Thirteen -	19	2	—	10·5	—	20	6	4	30·0	66·6
	3,386	1,028	95	30·3	9·2	1,475	689	275	46·9	40·0

It may be of interest to give similar particulars of those members of the "unvaccinated class" who were vaccinated either just before or during the invasion of their homes by small-pox. As already stated, these number 653, of whom 85 were attacked by small-pox. They are thus distributed :—

No. of Inmates.	Exposed.	Attacked.	Died.	Attack Rate.	Fatality.
				Per Cent.	Per Cent.
Three - -	21	6	3	28.5	50·0
Four - -	63	5	—	8·0	—
Five - -	110	10	4	9·0	40·0
Six - - -	119	11	3	9·2	27·2
Seven - -	133	24	5	18·0	20·8
Eight - -	85	17	7	20·0	41·1
Nine - -	51	2	—	3·9	—
Ten - - -	32	5	2	15·6	40·0
Eleven - -	20	1	—	5·0	—
Twelve - -	3	2	—	66·6	—
Thirteen -	16	2	1	12·5	50·0
	653	85	25	13·0	29·4

It remains to determine the relative extent to which the incidence of small-pox on the "vaccinated" and "unvaccinated" respectively occurred at different age periods. It will be seen that both amongst the "exposed" and the "attacked," the unvaccinated group preponderates amongst the children, the vaccinated amongst adults.

"Vaccinated" Class.

Age.	Exposed.	Attacked.	Died.	Attack Rate.	Fatality.
				Per Cent.	Per Cent.
1 month and under - -	—	—	—	—	—
1 month to 1 year - -	14	—	—	—	—
1 to 10 years - - -	258	24	1	9·3	4·1
10 to 30 years - -	1,649	539	30	32·6	5·5
30 years and over - - -	1,465	465	64	31·7	13·7
	3,386	1,028	95	30·3	9·2

"Unvaccinated" Class.

Age.	Exposed.	Attacked.	Died.	Attack Rate.	Fatality.
				Per Cent.	Per Cent.
1 month and under	23	20	19	87·0	95·0
1 month to 1 year	130	60	37	46·1	61·6
1 to 10 years	1,178	537	192	45·5	35·7
10 to 30 years	102	55	18	53·9	32·7
30 years and over	42	17	9	40·5	53·0
	1,475	689	275	46·9	40·0

And again detaching those "under" vaccination:—

Age.	Exposed.	Attacked.	Died.	Attack Rate.	Fatality.
				Per Cent.	Per Cent.
1 month and under	1	—	—	—	—
1 month to 1 year	56	10	3	17·8	30·0
1 to 10 years	550	66	21	12·0	31·8
10 to 30 years	39	8	1	20·5	12·5
30 years and over	7	1	—	14·2	—
	653	85	25	13·0	29·4

These results may be further summarised as follows:—

Below the age of 10 *years* there were 1,603 persons in this community of 899 households; 272 of them were vaccinated, 1,331 unvaccinated, or, to every 100, there were 17 vaccinated, 83 unvaccinated. The small-pox attack rate on the whole number was 40 per cent. (641 attacked), and the fatality amongst these 38·8 per cent. Amongst the *vaccinated* members the small-pox attack rate was 8·8 per cent., and the fatality amongst these cases, 4·1 per cent.* Amongst the *unvaccinated* members, the small-pox attack rate was 46·3 per cent., *i.e.*, nearly one-half of those exposed, and their fatality 40·1 per cent.

[These figures are materially increased if those of the "unvaccinated" who were undergoing vaccination at the time of the small-pox invasion be deducted, for this would give unvaccinated:—exposed, 724; attacked, 541; died, 224; *i.e.*, an attack rate of 74·4 per cent. and a fatality of 41·4 per cent.]

Above the age of 10 *years* there were 3,258 persons in this community of 899 households; 3,114 of them had been vaccinated in infancy or childhood, 144 of them were unvaccinated, or to every 100 there were 96 vaccinated to 4 unvaccinated. The small-pox attack rate on the whole number was 33 per cent. (1,076 attacked), and the fatality amongst these 11·2 per cent. Amongst the *vaccinated* members the small-pox attack rate was 32·2 per cent., and the case fatality 9.3 per cent. Amongst the *unvaccinated* members the small-pox attack rate was 50 per cent., and the fatality 37·5 per cent. of those attacked.

[Deducting those "under vaccination" causes an increase in these unvaccinated rates, for it leaves only 98 exposed, 63 attacked, 26 died, or an attack rate of 64·2 per cent,, and fatality of 41·2 per cent.]

Previous Small-Pox.—A certain number of individuals stated that they had previously been attacked with small-pox, and it may be of interest to ascertain to what extent this circumstance affects these rates. This assertion was made in respect to 77 individuals, 4 of whom were attacked in this epidemic. The deduction of these would give—

4,861 — 77 = 4,784 exposed to infection,
1,717 — 4 = 1,713 attacked with small-pox,

which would yield an attack rate of 35·8 instead of 35·3.

* There was one fatal case, that of a child (No. 1,695) already referred to, who was vaccinated within a month of being attacked with small-pox.

These 77 persons were thus distributed as to age :—

1 to 10 years - - -	2
10 ,, 30 ,, - - -	9
30 and over - - -	66—4 attacked,

and deducting them from the numbers already given we have :—

Age.	Exposed.	Attacked.	Rate.
			Per Cent.
1 to 10 years - -	1,436 − 2 = 1,434	561	39·1
10 to 30 years -	1,751 − 9 = 1,742	594	34·1
30 and over - -	1,507 − 66 = 1,441	482 − 4 = 478	33·7

Again these 77 individuals comprise 56 who had been vaccinated in infancy, and 21 who had not been vaccinated. Three of the former and one of the latter were attacked. Their deduction would thus affect the rates previously given :—

Age.	Exposed.	Attacked.	Rate.
			Per Cent.
Vaccinated - -	3,386 − 56 = 3,330	1,028 − 3 = 1,025	30·8
Unvaccinated -	1,475 − 21 = 1,454	689 − 1 = 688	47·3

And at age periods :—

Age.	Exposed.	Attacked.	Rate.
Vaccinated :—			Per Cent.
10 to 30 years -	1,649 − 6 = 1,643	539	32·8
30 and over -	1,465 − 50 = 1,415	465 − 3 = 462	32·6
Unvaccinated :—			
1 to 10 years -	1,178 − 2 = 1,176	537	45·6
10 to 30 years -	102 − 3 = 99	55	55·5
30 and over -	42 − 16 = 26	17 − 1 = 16	61·5

It will be observed that the attack rate amongst those who were said to have had small-pox before was 5·2 per cent.

§16.—Hospital Isolation and Vaccination.

It is important, but difficult, to endeavour to determine to what extent hospital isolation limits the spread of an infectious disease. In the present outbreak opportunity has been afforded for contrasting the incidence of small-pox in families amongst those whose members were removed to hospital, and those where they remained in their homes. Four categories may be established, viz. :—

A.—Households from which every case of small-pox was *removed to hospital* when it occurred.

B.—Households in which every case of small-pox that occurred was *retained at home.*

C.—Households from which the *initial case was removed to hospital*, whilst of those arising later some were retained at home, some perhaps removed.

D.—Households in which the *initial case was retained at home,* those arising later being either removed or also remaining.

In series A. there were 361 households.

,,	B.	,,	,, 629	,,
,,	C.	,,	,, 64	,,
,,	D.	,,	,, 44	,,
			1,098	

Dealing thus with the whole number of houses invaded by small-pox, the first question that arises is whether the removal of cases to hospital in any way influenced the numbers attacked in families. From the subjoined table it will be seen that in every one of the 108 households falling into categories C. and D. there was more than a single case of small-pox, showing that there was no material difference in this respect whether the initial case was removed to hospital or retained at home. It is, however, otherwise where *all* the cases were removed, for in Series A. there were 261 houses yielding single cases, or 72·3 per cent. of all invaded; whereas where *all* cases remained in their homes, as in Series B., there were 405 houses yielding single cases, or 64·3 per cent.

—		Group A.	Group B.	Group C.	Group D.	Total.
Multiple Cases	12	—	1	—	—	1
	11	—	—	1	—	1
	10	—	—	—	—	—
	9	—	—	1	1	2
	8	1	1	1	1	4
	7	—	3	3	1	7
	6	1	7	5	3	16
	5	7	14	9	7	37
	4	8	20	9	7	44
	3	25	50	13	6	94
	2	58	128	22	18	226
Single Cases - -		261	405	—	—	666
		361	629	64	44	1,098

From which it appears that amongst the households yielding multiple cases the proportion of houses having more than three cases was in Series A. 17 per cent., B. 20 per cent., C. 54·7 per cent., D. 54·5 per cent., showing a slight advantage in the cases of those where all the attacked were removed to hospital.

It will be remembered that the proportions of the various classes of vaccinated and non-vaccinated amongst the whole number of attacked were as follows:—

"Vaccinated" class 1,211, or 61·2 per cent.; "unvaccinated" class 768, or 38·8 per cent., the latter being divisible into those "under" vaccination when attacked, 89, or 4·5 per cent., and those who remained unvaccinated throughout, 679, or 34·3 per cent. It is interesting to compare these general results with those obtaining in each of the four series of groups of invaded houses, whose inmates were attacked in the following proportions:—

—	Vaccinated Class.		"Under" Vaccination.		Unvaccinated.	
	Attacked.	Per Cent.	Attacked.	Per Cent.	Attacked.	Per Cent.
Series A. - - - -	304	57·0	21	4·0	208	39·0
„ B. - - -	708	67·8	46	4·4	290	27·7
„ C. - - -	125	51·4	9	3·7	109	44·8
„ D. - - -	74	46·5	13	8·1	72	45·3

From which it would appear, contrasting A. and B. only, that there was a larger proportion of unvaccinated attacks in those households where every case was removed than in those where every case remained at home.

Analysing now the 899 households of whose members particulars were obtained, there is information of 231 in Series A., 567 in Series B., 60 in Series C., and 41 in Series D. It may be convenient to take each of these separately, considering (1) the attack-rate and fatality; (2) the vaccination condition of those exposed to infection, and then contracting small-pox, in respect to the number of inmates in each house.

SERIES A.

No. of Inmates Per House.	No. of Houses.	Numbers attacked with Small-Pox.								Total.		
		1.	2.	3.	4.	5.	6.	7.	8.	Inmates.	Cases.	Deaths.
1	1	1	—	—	—	—	—	—	—	1	1	—
2	11	10	1	—	—	—	—	—	—	22	12	2
3	23	21	1	1	—	—	—	—	—	69	26	7
4	42	31	6	3	2	—	—	—	—	168	60	8
5	34	23	7	3	—	1	—	—	—	170	51	23
6	41	26	7	5	1	1	1	—	—	246	70	24
7	26	14	7	3	2	—	—	—	—	182	45	22
8	21	9	5	2	3	2	—	—	—	168	47	12
9	22	14	5	2	—	1	—	—	—	198	35	7
10	6	3	1	1	—	—	—	—	1	16	16	3
11	3	2	—	1	—	—	—	—	—	33	5	2
13	1	—	1	—	—	—	—	—	—	13	2	1
	231	154	41	21	8	5	1	—	1	1,330	370	111

The attack rate on the whole number of inhabitants of these 231 houses was therefore 27·8 per cent.; in houses having six inmates or less, 32·5 per cent. (exposed 676, attacked 220); in houses having more than six inmates 22·9 per cent. (exposed 654, attacked 150). The fatality on the whole number was 30 per cent., or 29·1 per cent. in the smaller and 31·3 per cent. in the larger households (which necessarily contain a larger proportion of children).

No. of Inmates Per House.	Exposed to Infection.				Attacked by Small-Pox.			
	"Vaccinated."	"Under" Vaccination.	Unvaccinated.	Total.	"Vaccinated."	"Under" Vaccination.	Unvaccinated.	Total.
1	1	—	—	1	1	—	—	1
2	20	—	2	22	11	—	1	12
3	57	7	5	69	22	1	3	26
4	122	23	23	168	43	2	15	60
5	106	28	36	170	24	2	25	51
6	144	44	58	246	29	1	40	70
7	104	31	47	182	15	4	26	45
8	109	28	31	168	20	6	21	47
9	143	32	25	198	20	—	15	35
10	15	9	16	60	5	—	11	16
11	20	5	8	33	2	—	3	5
13	8	5	—	13	1	1	—	2
	867	212	251	1,330	193	17	160	370

The *attack rate* amongst the inmates of these houses belonging to the "vaccinated" class was therefore 22·2 per cent.; amongst those who were "undergoing" vaccination 8 per cent.; amongst the unvaccinated 63·7 per cent.

The *proportion* of the vaccinated amongst all the inmates was 65·2 per cent.; of those undergoing vaccination 16 per cent.; of unvaccinated 18·9 per cent. The like proportions amongst the attacked were, vaccinated, 52·1 per cent.; "under" vaccination, 4·6 per cent.; unvaccinated, 43·2 per cent.

In houses of six inmates or less the attack rates were, vaccinated, 29 per cent.; undergoing vaccination, 5·8 per cent.; unvaccinated, 67·7 per cent.

In houses of more than six inmates the attack rates were, vaccinated, 15·1 per cent.; undergoing vaccination, 10 per cent.; unvaccinated, 60 per cent.

The proportions amongst the inmates of the smaller households were, vaccinated, 66·5 per cent.; under vaccination, 15·1 per cent.; unvaccinated, 18·3 per cent. Amongst those of the larger households there were, vaccinated, 65·2 per cent.; under vaccination, 16·8 per cent.; unvaccinated, 19·4 per cent.

On the other hand the proportions amongst the attacked were, in the smaller houseoulds, vaccinated, 59·1 per cent.; under vaccination, 2·7 per cent.; unvaccinated, 38·2 per cent.; and in the larger households, vaccinated, 42 per cent.; under vaccination, 7·3 per cent.; unvaccinated, 50·7 per cent.

SERIES B.

No. of Inmates Per House.	No. of Houses.	Numbers attacked by Small-Pox.									Total.		
		1.	2.	3.	4.	5.	6.	7.	8.	12.	Inmates.	Cases.	Deaths.
1	1	1	—	—	—	—	—	—	—	—	1	1	—
2	62	45	17	—	—	—	—	—	—	—	124	79	8
3	105	74	25	6	—	—	—	—	—	—	315	142	16
4	86	66	15	8	—	—	—	—	—	—	356	120	26
5	107	65	23	12	6	1	—	—	—	—	535	176	26
6	68	37	18	6	3	3	1	—	—	—	408	124	22
7	59	33	8	5	4	7	1	1	—	—	413	128	26
8	41	20	7	6	3	—	4	1	—	—	328	95	23
9	16	5	1	6	1	1	—	1	1	—	144	49	4
10	6	5	1	1	—	1	1	—	—	—	90	21	2
11	5	3	2	—	—	—	—	—	—	—	55	7	—
12	4	—	1	—	2	—	—	—	—	1	48	22	6
13	1	1	—	—	—	—	—	—	—	—	13	1	—
	567	355	118	50	19	13	7	3	1	1	2,830	965	159

The attack rate on the whole number of inhabitants of these 567 houses was therefore 34·1 per cent.; in houses having six inmates or less, 36·9 per cent. (exposed, 1,739; attacked, 642); in houses having more than six inmates, 29·6 per cent. (exposed, 1,091; attacked, 323). The fatality on the whole number of attacks was 16·4 per cent., or 15·2 per cent. in the smaller, and 18·8 in the larger households.

Number of Inmates per House.	Exposed to Infection.				Attacked by Small-Pox.			
	Vaccinated.	Under Vaccination.	Unvaccinated.	Total.	Vaccinated.	Under Vaccination.	Unvaccinated.	Total.
1	1	—	—	1	1	—	—	1
2	123	—	1	124	78	—	1	79
3	265	13	37	315	114	5	23	142
4	280	33	43	356	89	2	29	120
5	397	74	64	535	120	6	50	176
6	280	65	63	408	71	7	46	124
7	274	81	58	413	65	11	52	128
8	229	45	54	328	51	8	36	95
9	102	12	30	144	28	2	19	49
10	73	6	11	90	12	2	7	21
11	45	9	1	55	6	1	—	7
12	30	2	16	48	9	2	11	22
13	5	8	—	13	1	—	—	1
	2,104	348	378	2,830	645	46	274	965

The *proportion* of the vaccinated amongst all the inmates was 74·3 per cent; of those undergoing vaccination at the time of the invasion, 12·3 per cent.; of the unvaccinated, 13·3 per cent. The like proportions amongst those who were attacked were, vaccinated, 66·8 per cent.; under vaccination, 4·7 per cent.; unvaccinated 28·4 per cent.

In houses having six inmates or less the proportions amongst them were, vaccinated, 77·4 per cent.; under vaccination, 10·6 per cent.; unvaccinated, 11·9 per cent.; whilst amongst the attacked the proportions were, vaccinated, 73·6 per cent.; under vaccination, 3·1 per cent.; unvaccinated, 23·2 per cent.

In houses having more than six inmates the proportions amongst them were, vaccinated, 69·4 per cent.; under vaccination, 14·9 per cent.; unvaccinated, 15·6 per cent.; and amongst the attacked, vaccinated, 53·2 per cent.; under vaccination, 8 per cent.; unvaccinated, 38·7 per cent.

The *attack rate* amongst all those of the "vaccinated class" was 30·6 per cent.; of those under vaccination, 13·2 per cent.; of the unvaccinated, 72·4 per cent.

In the smaller households the attack rates were, for the vaccinated, 35·1 per cent.; for those under vaccination, 10·8 per cent.; for the unvaccinated, 71·6 per cent.

In the larger households the attack rates were, vaccinated, 22·6 per cent.; under vaccination, 16·0 per cent.; unvaccinated, 73·5 per cent.

SERIES C.

Number of Inmates per House.	No. of Houses.	Numbers attacked by Small-Pox.									Total		
		2.	3.	4.	5.	6.	7.	8.	9.	11.	Inmates.	Cases.	Deaths.
2	1	1	—	—	—	—	—	—	—	—	2	2	—
3	2	2	—	—	—	—	—	—	—	—	6	4	—
4	5	4	1	—	—	—	—	—	—	—	20	11	2
5	9	5	2	1	1	—	—	—	—	—	45	25	6
6	6	3	2	1	—	—	—	—	—	—	36	16	2
7	12	2	2	5	2	—	1	—	—	—	84	47	9
8	8	2	1	—	2	3	—	—	—	—	64	35	7
9	7	2	1	1	2	—	1	—	—	--	63	28	11
10	3	—	1	—	—	1	—	1	—	—	30	17	5
11	3	1	—	1	—	—	—	—	—	1	33	17	6
12	3	—	—	—	—	1	1	—	1	—	36	22	9
13	1	—	—	—	1	—	—	—	—	—	13	5	3
	60	22	10	9	8	5	3	1	1	1	432	229	60

The attack rate on the whole number of the habitants of those 60 houses was therefore 53 per cent.; in houses having six inmates or less, 53·2 per cent. (exposed, 109; attacked, 58); in houses having more than six inmates, 52·9 per cent. (exposed, 323; attacked, 171). The fatality on the whole number of attacks was 26·2 per cent., or 17·2 per cent. in the smaller and 29·2 in the larger households.

Number of Inmates per House.	Exposed to Infection.				Attacked by Small-pox.			
	Vaccinated.	Under Vaccination.	Unvaccinated.	Total.	Vaccinated.	Under Vaccination.	Unvaccinated.	Total.
2	2	—	—	2	2	—	—	2
3	5	1	—	6	4	—	—	4
4	15	4	1	20	10	—	1	11
5	26	7	12	45	15	1	9	25
6	21	9	6	36	11	2	3	16
7	50	7	27	84	24	4	19	47
8	32	9	23	64	12	1	22	35
9	41	5	17	63	18	—	10	28
10	14	3	13	30	4	—	13	17
11	21	6	6	33	11	—	6	17
12	20	1	15	36	7	—	15	22
13	6	3	4	13	—	1	4	5
	253	55	124	432	118	9	102	229

The *proportion* of the vaccinated amongst all the inmates was 58·5 per cent.; of those undergoing vaccination, 12·7 per cent.; of the unvaccinated, 28·7 per cent. Amongst those who were attacked the proportions were, vaccinated, 51·5 per cent.; under vaccination, 4 per cent.; unvaccinated, 44·5 per cent.

In houses having six inmates or less the proportions amongst them were, vaccinated, 63·3 per cent.; under vaccination, 19·2 per cent.; unvaccinated, 17·4 per cent.; whereas amongst the attacked the proportions were, vaccinated, 72·4 per cent.; under vaccination, 5·1 per cent.; unvaccinated, 22·4 per cent.

In houses having more than six inmates the proportions amongst them were, vaccinated, 57 per cent.; under vaccination, 10·5 per cent.; unvaccinated, 32·5 per cent.; whilst amongst those who were attacked the proportions were, vaccinated, 44·4 per cent.; under vaccination, 3·5 per cent.; unvaccinated, 52 per cent.

The *attack rate* amongst all of the "vaccinated" class was 46·6 per cent.; of those under vaccination, 16·3 per cent.; unvaccinated, 82·2 per cent.

In the smaller households the attack rates were, for the vaccinated, 60·8 per cent.; under vaccination, 14·3 per cent.; unvaccinated, 68·4 per cent.

In the larger households the attack rates were, vaccinated, 41·3 per cent.; under vaccination, 17·6 per cent.; unvaccinated, 84·7 per cent.

SERIES D.

Number of Inmates per House.	No. of Houses.	Numbers attacked by Small-pox.								Total		
		2.	3.	4.	5.	6.	7.	8.	9.	Inmates.	Cases.	Deaths.
2	1	1	—	—	—	—	—	—	—	2	2	1
3	3	3	—	—	—	—	—	—	—	9	6	1
4	6	3	2	1	—	—	—	—	—	24	16	1
5	6	1	2	1	2	—	—	—	—	30	22	3
6	3	1	1	—	—	1	—	—	—	18	11	4
7	8	3	1	2	—	2	—	—	—	56	29	8
8	3	—	—	1	2	—	—	—	—	24	14	7
9	4	—	—	1	2	—	—	1	—	36	22	8
10	7	3	—	1	1	—	1	—	1	70	31	7
	41	15	6	7	7	3	1	1	1	269	153	40

The attack rate on the whole number of the habitants of these 41 houses was therefore 56·8 per cent.; in houses having six inmates or less, 68·6 per cent. (exposed, 83; attacked 57); in houses having more than six inmates, 51·6 per cent. (exposed, 186; attacked, 96). The fatality on the whole number attacked was 26·1 per cent., or 17·5 per cent. in the smaller and 31·2 per cent. in the larger households.

Number of Inmates per House.	Exposed to Infection.				Attacked by Small-pox.			
	Vaccinated.	Under Vaccination.	Un-vaccinated.	—	Vaccinated.	Under Vaccination.	Un-vaccinated.	—
2	2	—	—	2	2	—	—	2
3	7	—	2	9	4	—	2	6
4	16	3	5	24	10	1	5	16
5	19	1	10	30	11	1	10	22
6	10	1	7	18	3	1	7	11
7	35	14	7	56	17	5	7	29
8	13	3	8	24	4	2	8	14
9	19	2	15	36	7	—	15	22
10	41	14	15	70	14	3	14	31
	162	38	69	269	72	13	68	153

The *proportion* of vaccinated amongst all the inmates was, 60·2 per cent.; of those undergoing vaccination, 14·1 per cent.; of the unvaccinated, 25·6 per cent. Amongst those who were attacked the proportions were, 47·0 per cent.; under vaccination, 8·5 per cent.; unvaccinated, 44·4 per cent.

In houses having six inmates or less the proportions were, vaccinated, 65 per cent.; under vaccination, 6 per cent.; unvaccinated, 29 per cent.; whereas amongst the attacked there were, vaccinated, 52·6 per cent.; under vaccination, 5·2 per cent.; unvaccinated, 42·1 per cent.

In houses having more than six inmates the proportions were, vaccinated, 58 per cent.; under vaccination, 17·7 per cent.; unvaccinated, 24·2 per cent.; whilst amongst the attacked there were, vaccinated, 43·7 per cent.; under vaccination, 10·4 per cent.; unvaccinated, 45·8 per cent.

The *attack rate* amongst all of the "vaccinated" was 44·4 per cent.; of those "under" vaccination, 34·2 per cent.; of the unvaccinated, 98·2 per cent.

In the smaller households the attack rates were, vaccinated, 55·5 per cent.; under vaccination, 60 per cent.; unvaccinated, 100 per cent.

In the larger households the attack rates were, vaccinated 38·8 per cent.; under vaccination, 32·3 per cent.; unvaccinated, 97·7 per cent.

The foregoing figures demonstrate that although the attack rate was higher in those households where every one attacked with small-pox was kept at home than in

those where they were all removed to hospital, yet that the proportion of the vaacinated inmates was nearly 10 per cent. higher in the former class (Series B). In the two other series where the initial case was removed (C) or retained (D) the attack rate was much higher, but so were the proportions of the unvaccinated inmates.

Indeed one of the most singular results of this analysis is to show that no matter what the conditions obtaining as regards isolation, the attack rates are inversely to the proportionate numbers exposed to infection, being as much lower amongst the vaccinated as they are higher amongst the unvaccinated. The mean proportion of the vaccinated members of the community was 64 per cent.; of the unvaccinated, 21 per cent.; but the mean attack rate was for the vaccinated 35 per cent., for the unvaccinated 79 per cent. For in round numbers the proportions of the *vaccinated* in each series were 65, 74, 58, 60, the attack rates amongst them being 22, 30, 46, 44, respectively. On the other hand the proportions of the *unvaccinated* members were 19, 13, 29, 25, their attack rates being 64, 72, 82, 98, respectively. A similar relationship exists whether smaller or larger households are dealt with, the main difference being the larger proportion of the unvaccinated in the larger households, owing to the preponderance of children in them. The somewhat mixed character of the class of those "under vaccination," most of whom perhaps are *quâ* modification to be grouped with the vaccinated, and many with the unvaccinated, may possibly account for a less constant variation; they form but a small proportion of those exposed, viz., from 4 to 8 per cent. in each series, whereas the attack rate amongst this class ranged from 8 to 34 per cent., the average being much below that of the vaccinated class.

GLOUCESTER.—LIST of HOUSES KNOWN to have been INVADED by SMALL-POX from June 1895 to July 18th 1896.

N.B.—Houses in which particulars as to the remaining Inmates were not obtained given in *italics*.

Address.	Details as to all Inmates.	*Details of Cases only.*
Adelaide Street, 36, 51, *56*, 60, 78. Buxton Villa	5	*1*
Albany Street, 4, 7, 8, 9, 30, 36. "*Laburnum*" *Inn*	6	*1*
Albert Street, *5*, 12, 15, 20	3	*1*
Albion Street, Rose Villa	1	—
Alexandra Road, "Ingledene"	1	—
Alfred Street, 2, 3, 4, 6, 8, 10, 16, 18, 22, 62, *76*, 82, 106, and 108. Grove Villa	14	*1*
Alma Place, 1, 3, 5, 6, 7, 9, 10, 11, 12, 16, 23, 24, 25, 28, 31, 32, 33, 34, 35, 37, 39, 40, 41, 43, 46, 47, 48, 49, 50, 51, 52, 55, 56, 58, 61, 62, *72*, 78, 82, 88, 90, 94, 98, 100, 102, 104, 106, 108, 112, 114.	49	*1*
Alma Terrace, 1, 2, 4, 5, 6, 7, 8	7	—
Alvin Street, 20, 23, *24*, 25, 74. "*King William*" *Inn*	4	*2*
Archibald Street, 7, 19, 20	3	—
Arthur Street, *23a*	—	*1*
Avenue Road, Avenue Villa	1	—
Baker Street, 3, 7, 9, 10	4	—
Barbican Road, *5*	—	*1*
Barton Street (and Lower Barton Street), 9, 26, 28, 30, 46, *54*, 61, *66*, 74, 94, *96*, 97, *98*, 105a, *110*, 115, 118, 126, *128*, 129, 132, 138, 143, 163, 165, 196, 226. *Ballington Passage.* Barton Lawn. *Gothic Cottages, 1, 5.* "Homelands." Rose Cottage. St. James's Crescent, 4. Stanley Cottages, 2. Twin Cottages, 3. *Victoria Cottages, 1, 3. Wildman's Passage*, 3. *Whitehouse Passage.*	27	*13*
Barton Terrace, 16, 18, 23, 27, 41, *48*, 55, 59, *63*, *103*	7	*3*
King's Barton Street, 1, *16*. Witticomb Terrace, 1	2	*1*
Bedford Street, 7	1	—
Birchmore Road, 3, 7, 18, *29*, 30, 34	5	*1*
Bishopstone Road, 3	1	—
Blackfriars, 6, 16	2	—
Blenheim Road, 7, 11, 20, *28*, 47, 55, 65	6	*1*
Bristol Road, *40*, 53, 61, *69*, 101. "*P.O.*" *Quedgley Villa. Berkeley Villa*	3	*5*

Address.	Details as to all Inmates.	*Details of Cases only.*
Brook Street, *14*, 20, 47, *57*, 59, 63, 65, 68	6	*2*
Bull Lane, 16	1	—
Cambridge Street, 18	1	—
Carmarthen Street, 1, 4, 8, 13, 16, 20, 21, 22, 24, 25, 26	11	—
Castle Street, 2, 3, 4, 5, 6, 10, 13, 16, 17, *20*, 25, 27, *30*, 33, *34*, 35, 45, 46, 51, 53, 58, 60, *74*.	19	*4*
Cecil Road, 1, *4*, 8, 11, 12, 15, 20, 28, 31, 32	—	—
Cecil Road (Upper), —?, *2*. Mace's Buildings. *Hillview Terrace*, *4*	10	*4*
Church Street, *5*, 11	1	*1*
Chapel Street, St. Mary's Square, 6	1	—
Charles Street, *11*, 20	1	*1*
Clarence Street, 5	1	—
Clegram Road, 6, 26, 27, 28, 29, 31, *33*. Alexandra Villa, 3, 4. Cavendish House. Clare Terrace, 1, 2, 4, 5. Clegram Villas, 1, 2. Florence Villas, 1. Hope Villa. Roath Villas, 1.	18	*1*
Clement Street, 3, 9, 12, 13, 14, 15, 24, 27, 28, 34, 39, 42, 48, 56. Clement Cottages, *1*, 2, 3.	16	*1*
Clifton Road, *2*, 6, 11, 24, 26, 28, 34, *58*, 60	7	*2*
Clifton Terrace, 44, 46	2	—
Conduit Street, 3, 8, 13, 14, 16, 21, *36*, 68. Fowey Villas, *1*, 2. Prospect House	9	*2*
Counsel Street, *4*, 7, 9, *15*	1	*3*
Dainty Street, *3*, *6*, 9, 10, 11, 12	4	*2*
Daventry Terrace, 2, 4	2	—
Deacon Street. *Tory Cottage*, *5*	—	*1*
Derby Road, *5*, 7, 9, *34*, 37, 42, 44, 46, 48. Lyppiatt Villa	7	*3*
Dineley Street, *3*, 23	1	*1*
Ducie Street, 6, 8, *13*, 19, 23, 31, *33*, *35*, 41, 43, 55, 57. Ducie Cottage, *6*, 10	10	*4*
Dynevor Street, 3, 4, 6, 10, 12, 21, 27	7	—
"Docks." *Lighter*—"*George*"	—	*1*
Eastend Road, 20, 39, 41, 50, 62	5	—
Exhibition Street, 3, *4*, 10	2	*1*
Farnbrook Terrace, *3*	—	*1*
Falkner Street, 1, 9, 38, 75, 75a, 99, 100, 107. Elm Villa. *Rock Villa*	9	*1*
Forest Terrace, 2, 3, 4, 5, 9, 14	6	—
Gardiner's Row, 2	1	—
Goodyer Street, *5*	—	*1*
Grove Street, 11, 19	2	—
Guinea Street, 2, 16	2	—
Hanman's Road, 2, 14, 26, 30, 39, *40*, 45, 48	7	*1*
Hare Lane, *15*, 78	—	*2*
Henry Street, 2	1	—
Herbert Road, 2, *10*, 11, 14, 16, *19*	4	*2*
Hethersett Road, 16	1	—
High Street, 45, 51, 115, 117, *121*, *122*, 128, 149, 161, 191	8	*2*
Hopewell Street, 4, 10, 15, 18, 19, 20, 21, 32, 34, 38, 47, *49*, 56, 58. "Robin Hood" Inn.	14	*1*
Howard Street, 3, 29, 38, 57, *58*, 63, 65, 75, 101, 105	9	*1*
Hyde Lane, *21*	—	*1*
India Road, 2, 10, 21, 25, 28, 30, 50, 60, 66, *68*, 74	10	*1*
Jersey Road, 1, 8, 10, 13, 22, 24. Falcon Villa	7	—
Knowles Road —?, 5, 6, 11, 14, *22*, 24, 27. "Anniville." Windsor Terrace, 2	9	*1*
Ladybellgate Street, 2, 3, 6	3	—
Linden Road, 5, 10, 12, 23, 55, 56, 65, 81. *Board School*. Blomfield Terrace, 1. "Fernleigh." Linden Terrace, 1, 3, 4. "Lyndhurst." "Morningside," 3, 6. Sunningdale Terrace, *6*, 12. Woodbine Cottage.	18	2
Llandilo Street, 2, 8, *12*, *15*	2	*2*
Llanthony Cottages, 2, 3	2	—
Llanthony Road, 4, 22	2	—
London Road, 68	1	—
Longsmith Street, 29, 38. *Brown's Lodging House*. Pridey's Passage	3	*1*
Magdala Road, 7, 9, *15*, *19*, 27, 35	4	*2*
Magdala Terrace, 1, 2, 10, 23, 25	5	—
Matson Place, 9, 10, 21	3	—

Address.	Details as to all Inmates.	*Details of Cases only.*
Melbourn Street, 4, 9, 10, 16, 18, 21, 22, 25, 26, 27, 30, *32*, 33, *37*, 40, 42, 47, 52, 56, 70, 71, 76, 78, 108, 110, 112, 114, 118, 122, 124, 142, 164.	30	*2*
Midland Road, 38. Midland Railway Crossing Cottage	2	—
Milbrook Street, 8, 16, 17, 23, 29, 45, *49*, 60, 68, 76, 77, 78, *82*, 86, *116*, 126, 132. "Bee-hive" Inn. Old Row, 10. Vauxhall Terrace, 3, 4, 8. Windsor Place, 3, 7, 9.	21	*4*
Mill Street, 1, 6	2	—
Mitre Street, 12, *31*	1	*1*
Moor Street, *5*, *15*, *27*, 32, *33*, 38, 48, 54, *54a*, 64	5	*5*
Morpeth Street, *5*, 10, 16, 20, 24, *29*, 30, 31, 34. *Elmstone Villa*	7	*3*
Morton Street, 9, 10, 11, 13, 24, 26, 28, 30, 34, 38, 41, 44, 45, *45a*, 46. George's Row, 3, 4, *5*, 6, 7.	18	*2*
Napier Street, 4, 5, 6, 10, 12, 18, 26, *44*, 51, 61, 63	10	*1*
Nelson Street, 8, 9, 10, 11, 19, 23, 25, 27, 29, 33, *39*, 40, 42, 44, 48	14	*1*
New Street, 2, 5, 6, 7, 12, 14, 16, 21, 25, 26, 27, 28, *30*, *39*, 40, 41, 42, 43, 44, 47, 51, 55, 56, 57, 60, 61, 62, 63, 64, *65*, 70, 76, 80, 80 (*bis*), 81, *83*, 85, 86, 88, 91, *98*, 100, 106, 110, 111, 113, 120.	42	*5*
Norfolk Street. Goulder's Yard, 2	1	—
Northgate, 52. "Black Dog" Inn	2	—
High Orchard Street, —?, *1*, 4, 10	2	*2*
Oxford Terrace, 6	1	—
Painswick Crossing Cottage	1	—
Park Road, 28. Havelock Terrace, 8	2	—
Parkend Road, 13, *51*. *"Ellesmere" Hamman's Terrace, 3*	1	*3*
Parliament Street, 3. Brisbane Cottages	1	*1*
Paul Street, 1, 6, 8, 12, *16*, *18*	3	*3*
Pembroke Street, 9, 20	2	—
Percy Street, 15, *17*	1	*1*
Philip Street, 12, 13, 14, 19, 20, 30, 38, *42*, 51	8	*1*
Portland Street, 10	1	—
Prince's Street, 12, 15, *23*, *28*, 41	3	*2*
Priory Road, 102	1	—
Quay Street. *Norman's Row, 3*	—	*1*
Raglan Street, 3, 4, 6	3	—
Regent Street, 1, 19, 24, 42, 60, 62, 65, 67, 81, 82. *Belgrave Terrace, 3*	10	*1*
Robin Hood Street, 1, 6, 13, 14, 17, 20, 26, 28, 29, 32, 34, 37, 39, 43, 45, 46, 48, 49, 50, 54, 55, 60, 62, 68.	24	—
Russell Street, 18	1	—
Ryecroft Street, 10, 12, 15, 19, 33, 36, 39, 41, 45, 53, 57, 61, *74*, *113*, 121	13	*2*
St. Catherine Street, 56, 83	2	—
St. James's Street, 1, 2, 6, 7, 8, 9, 11, 12, 22, *24*, 26, 28, 30, 34, 52. Alma Place, 1, 3, 6	16	*2*
St. John's Lane, *23*	—	*1*
St. Luke Street, —?, 7	2	—
St. Mark Street, 23, 51	2	—
St. Mary's Square, *26*. Clare Street, 1	1	*1*
St. Nicholas Terrace, Quay, *4*	—	*1*
St. Paul's Road, 3, 12, 15, 24, 30, 31, 32, *34*, 50, 57. 5 Wyndale Terrace. "Northernhay."	11	*1*
Salisbury Road, 24, 26, 33, 37, 50, *62*, 64	6	*1*
Sebert Street, 14, 16, 56	3	—
Seymour Road, 3, *5*, 7, 36. Alma Road. Clarence Villa. Eunice Villa. Fernlea Villa, 5. *Grove Villa*, *1*, St. Anne's Terrace, 1. Thornmead Villa, 3.	8	*3*
Shakespeare Passage, —?	—	*1*
Sherborne Street, 2, 8, 13, *20*, 22, 40, 42, 43, 44, 68, 70, *80*, *84*, 90. *Wells Cottage*, *3*, *4*.	10	*6*
Sidney Street, 19, 26, 27, 35	4	—
Sinope Street, 2, 12, 18, 21, 29, 32, 34, 40	8	—
Slaney Street, 2 Henry Place	1	—
Somerset Place, 4, 11	2	—
Southgate, 106. Raglan Terrace, 3. *Sudbrook House.* *"Wheatsheaf" Inn*	2	*2*
Spa Road, "Severndale"	1	—
Station Road, *"Bleak House"*	—	*1*
Stratton Road, 1a, 11, 13, *14*, 34, *46*, 58	5	*2*
Stroud Road, 4, 10, 11, 17, 21, 23, 27, 35, 37, 41, 43, 59. *Bath Buildings*, *4*, *9*. Cut Hill House. Elm Villa. *Laurel Villa*. *Lorne Villa*. Windsor Villa.	15	*4*
Suffolk Street, 46, *59*, 60, 70	3	*1*
Swan Lane, *17*. Turles Yard, 6	1	*1*
Sweetbriar Street, 4, *21*, 60	2	*1*
Sydenham Terrace, 7, 11, 13, 19	4	—

Address.	Details as to all Inmates.	*Details of Cases only.*
Theresa Street, 1, 7, 17, *23*, 24, 26, 31, *35*, *39*, 41, *43*, 49, *61*	7	*6*
Old Tram Road, *5*, 7	2	—
Tredworth Road, 2, 9, *15*, *18*, 19, *20*, 21, 24, 25, 34, 42, 44, 51, 59. "Round House"	12	*3*
Tweenbrook Villas	—	*1*
Twyver Street, 6, 7, 10, 16, 19, 23, 26, 37, 41	9	—
Union Street, 7, 11, 23, 27. *Railway Cottages*, *1*	3	*2*
Union Workhouse	—	*1*
Upton Street, *8*, *13*, 14, 17, 24, 35, *65*	4	*3*
Vauxhall Road, *1*, *5*, 9, 11, 21, 26, 27, 38, 54, 59, 68	10	*1*
Victoria Street, 8, 9, 10, 22, 25, *27*, *28*, 29, 30, 37, 39, 47, 55, 56, 60, 62, *68*, 75, 80, 96	17	*3*
Victory Road, 1, *4*, 9, 10, 14, 19, *22*, *24*, 25, 26, 30, 31, 32, 35, 37, 39. Massey Parade, 1, 2, *3*, *4*.	15	*5*
Wellesley Street, 1, 2, 11, 17, 24, 26, *27*, 28, 29, 34, 36, 46, 48	12	*1*
Wellington Street, 5, *11*, 15, 20, 26, 34, 42	6	*1*
Westend Parade, *4*	—	*1*
Westgate (Lower), *23*, *46*, 90, *114*. Forester's Court, 1. Levi's Court, 2, *9*. Quay Court, 3. *Smith's Lodging House*. Stephens Court, 1, 2, *3*, *4*, *5*, *6*.	6	*9*
Weston Road, 17, 28, 30. Lorraine Villa. Tyndale Manse	5	—
Widden Street, 10, 25, 29, 30, 32, 43, 48, 60. Sydney Villa	9	—
Windmill Parade, 8, *28*	1	*1*
Worcester Parade, *13*, 21	1	*1*
Worcester Street, 26, 57, 63	3	—
Worrall Street, *18*, 20, 22, 24, 35. Worrall Court, 1, 2, 3	7	*1*
Total	899	199
	1,098	

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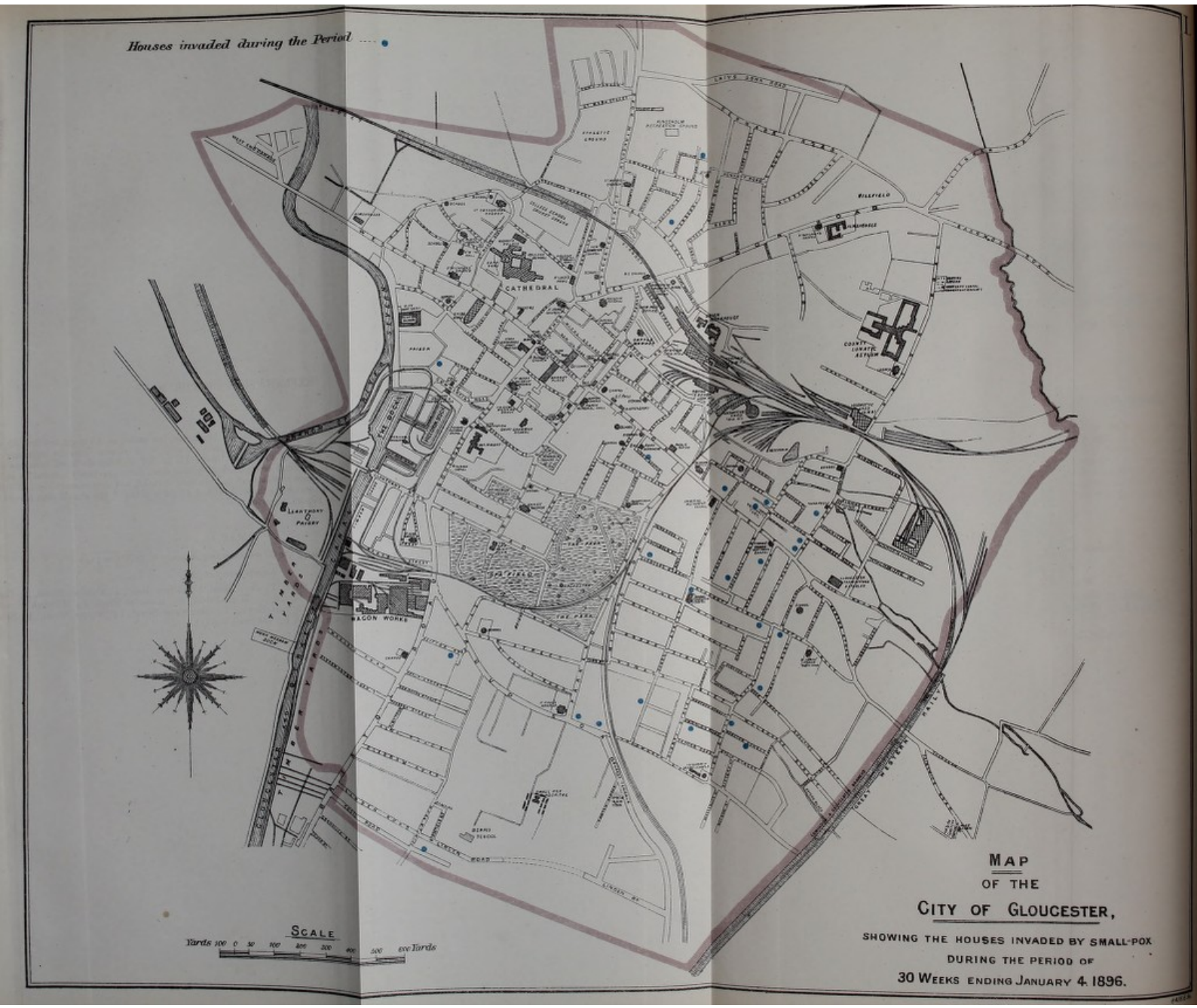
Map 16.—Spot-map indicating the situation of houses invaded by small-pox during the epidemic, as well as the population density of the four registration sub-districts of Kingsholm, St. Nicholas, South Hamlet, and St. John Baptist - - - - 182



MAP
OF THE
CITY OF GLOUCESTER,
SHOWING THE HOUSES INVADED BY SMALL-POX
DURING THE PERIOD OF
30 WEEKS ENDING JANUARY 4. 1896.

EXPLANATION OF THE MAPS.

The march of the epidemic may be followed in the accompanying series of 15 maps, the first of which indicates the situation of the houses known to have been invaded by small-pox from the beginning of the outbreak to January 4th, 1897, a period of 30 weeks. Maps II. to XV. indicate the house invasions during each subsequent fortnight, the new invasions being marked by blue dots, those previously invaded by red dots. During the whole epidemic 1,098 houses were known to have been invaded, and they occurred in 155 different streets. To facilitate the study of these maps there is affixed to each a list of the streets thus invaded, but fuller details will be found in the Report, pages 36 to 68.

MAP I.

Houses invaded during the 30 weeks ending January 4, 1896 (*see* page 36).

Streets invaded (20).

Barbican Road, 1; King's Barton Street, 1; Cecil Road, 1; Clifton Road, 1; Conduit Street, 2; Counsel Street, 1; Derby Road, 3; Goodyer Street, 1; High Street, 1; Knowles Road, 1; Milbrook Street, 2; Moor Street, 1; Morton Street, 1; Rycroft Street, 1; Sherborne Street, 1; Sinope Street, 1; Stratton Road, 1; Stroud Road, 2; Upton Street, 1; Vauxhall Road, 1.

Total houses invaded, 25.

MAP II.

Houses invaded during the Fortnight ending January 18, 1896 (*see* page 37).

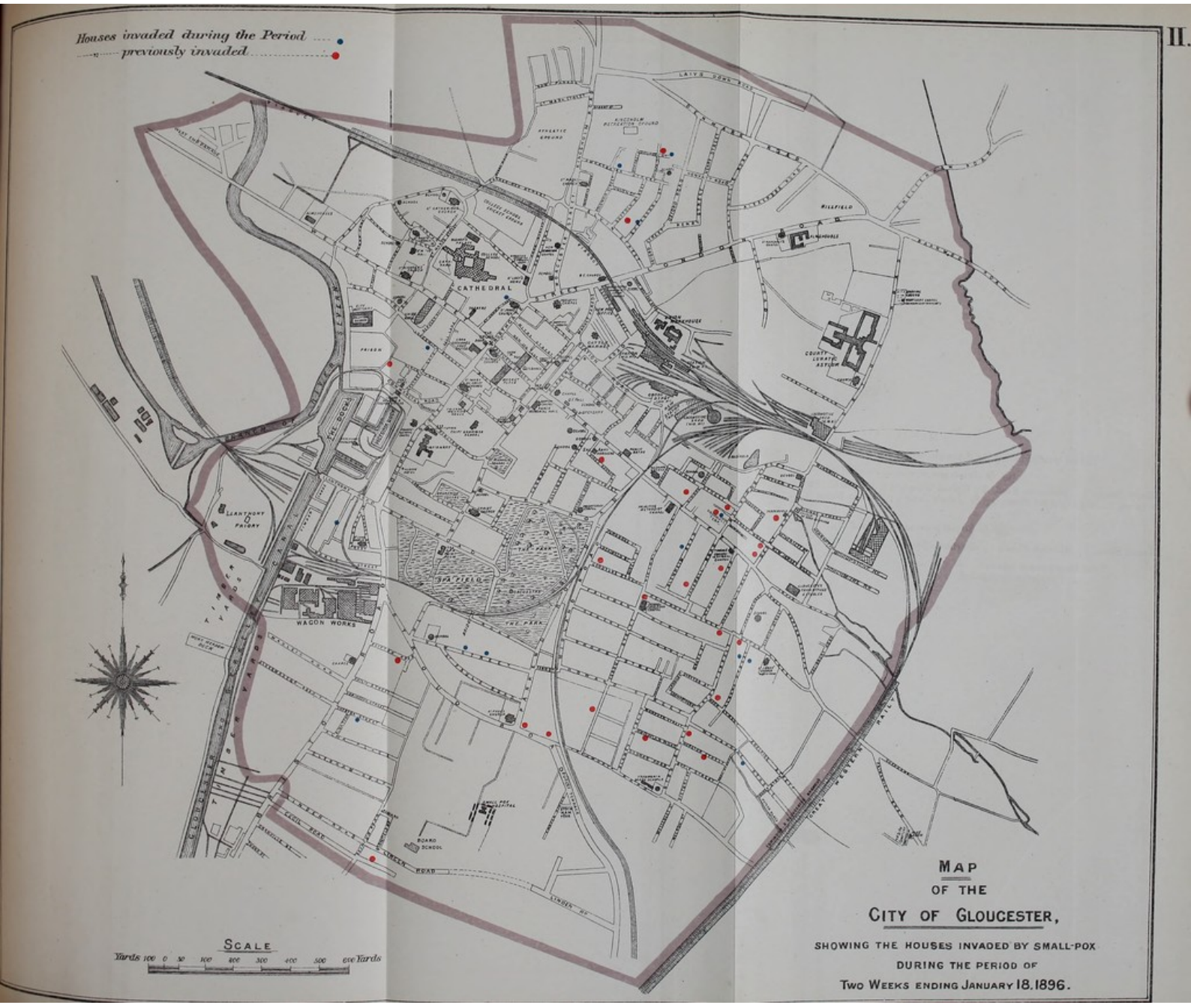
(a) *In Streets not previously invaded* (9).

Albany Street, 2; Blenheim Road, 1; Guinea Street, 1; Longsmith Street, 1; Melbourn Street, 1; New Street, 2; High Orchard Street, 1; St. John's Lane, 1; Theresa Street, 1.

(b) *In Streets previously invaded* (3).

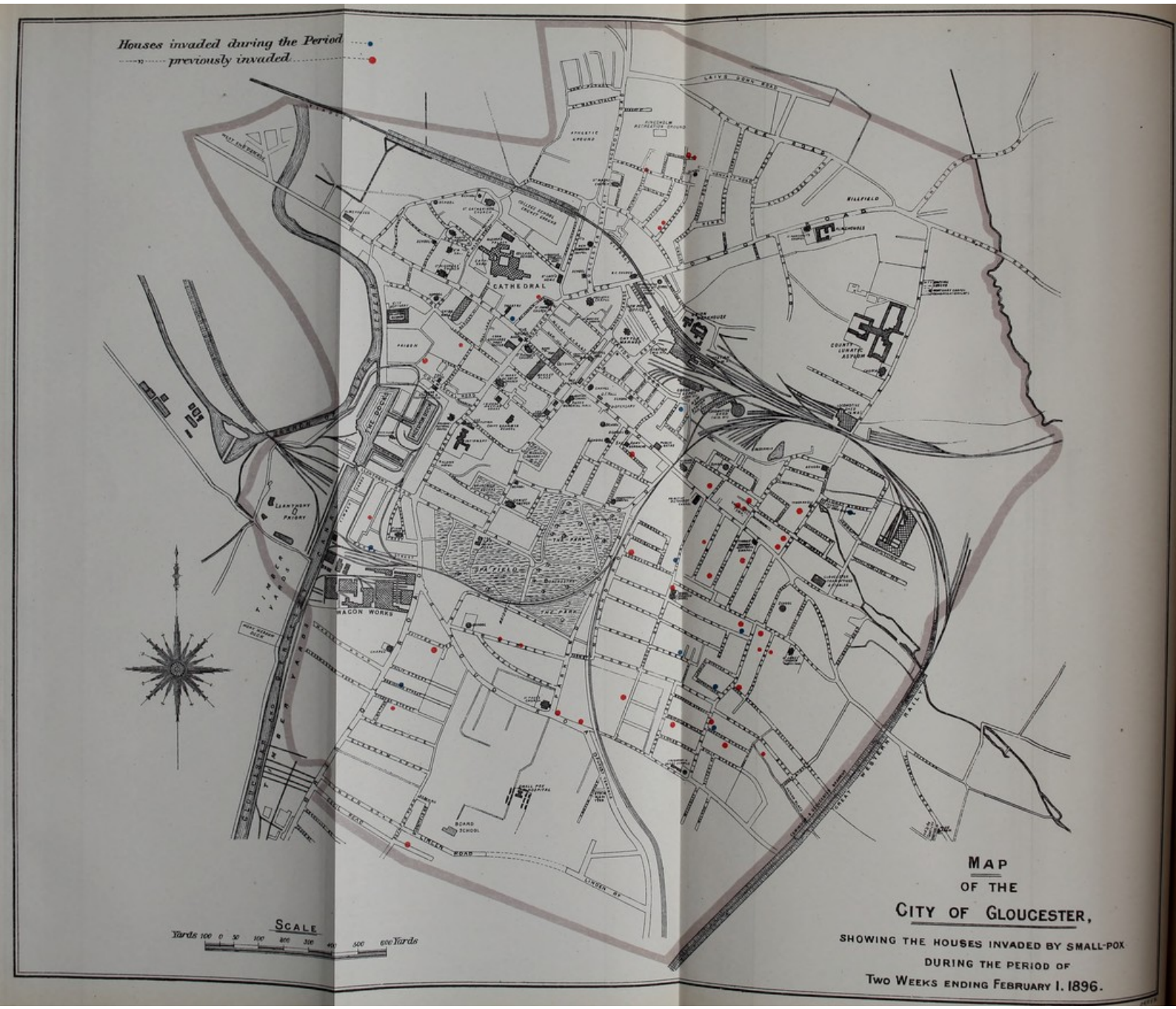
Counsel Street, 1; Milbrook Street, 1; Sherborne Street, 1.

Total houses newly invaded - - - - - -	14
„ previously invaded - - - - - -	25
	39



MAP
OF THE
CITY OF GLOUCESTER,

SHOWING THE HOUSES INVADED BY SMALL-POX
DURING THE PERIOD OF
TWO WEEKS ENDING JANUARY 18, 1896.



MAP
OF THE
CITY OF GLOUCESTER,

SHOWING THE HOUSES INVADED BY SMALL-POX
DURING THE PERIOD OF
TWO WEEKS ENDING FEBRUARY 1. 1896.

MAP III.

Houses invaded during the Fortnight ending February 1, 1896 (*see* page 38).

(a) *In Streets not previously invaded* (9).

Baker Street, 1; Brook Street, 1; Carmarthen Street, 1; Falkner Street, 1; Robin Hood Street, 1; Shakespeare Passage, 1; Sidney Street, 1; Station Road, 1; Victoria Street, 1.

(b) *In Streets previously invaded* (1).

High Street, 1.

Total houses newly invaded - - - - - -	10
,, previously invaded - - - - - -	39
	49

MAP IV.

Houses invaded during the Fortnight ending February 15, 1896 (*see* page 39).

(a) *In Streets not previously invaded* (15).

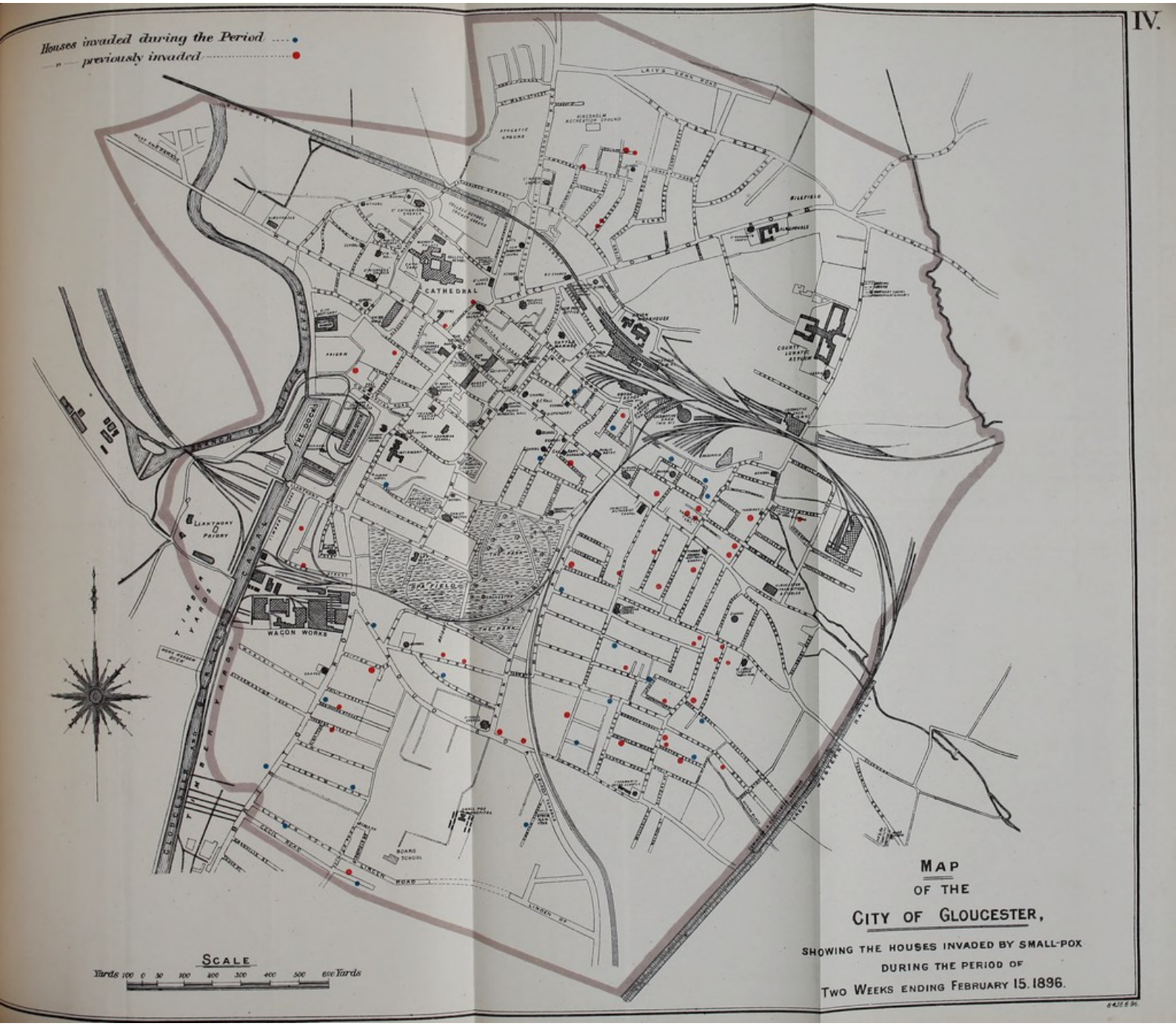
Albion Street, 1: Bedford Street, 1; Bristol Road 1; Castle Street, 1; Clegram Road, 1; Dynevor Street, 1; Hanman's Road, 1; Howard Street, 1; Linden Road, 1; Napier Street, 2; Princes Street, 1; Raglan Street, 1; Regent Street, 1; St. Paul's Road, 1; Wellington Street, 1.

(b) *In Streets previously invaded* (6).

Cecil Road, 1; Falkner Street, 1; Moor Street, 1: Morton Street, 1; Robin Hood Street, 1; Stroud Road, 1.

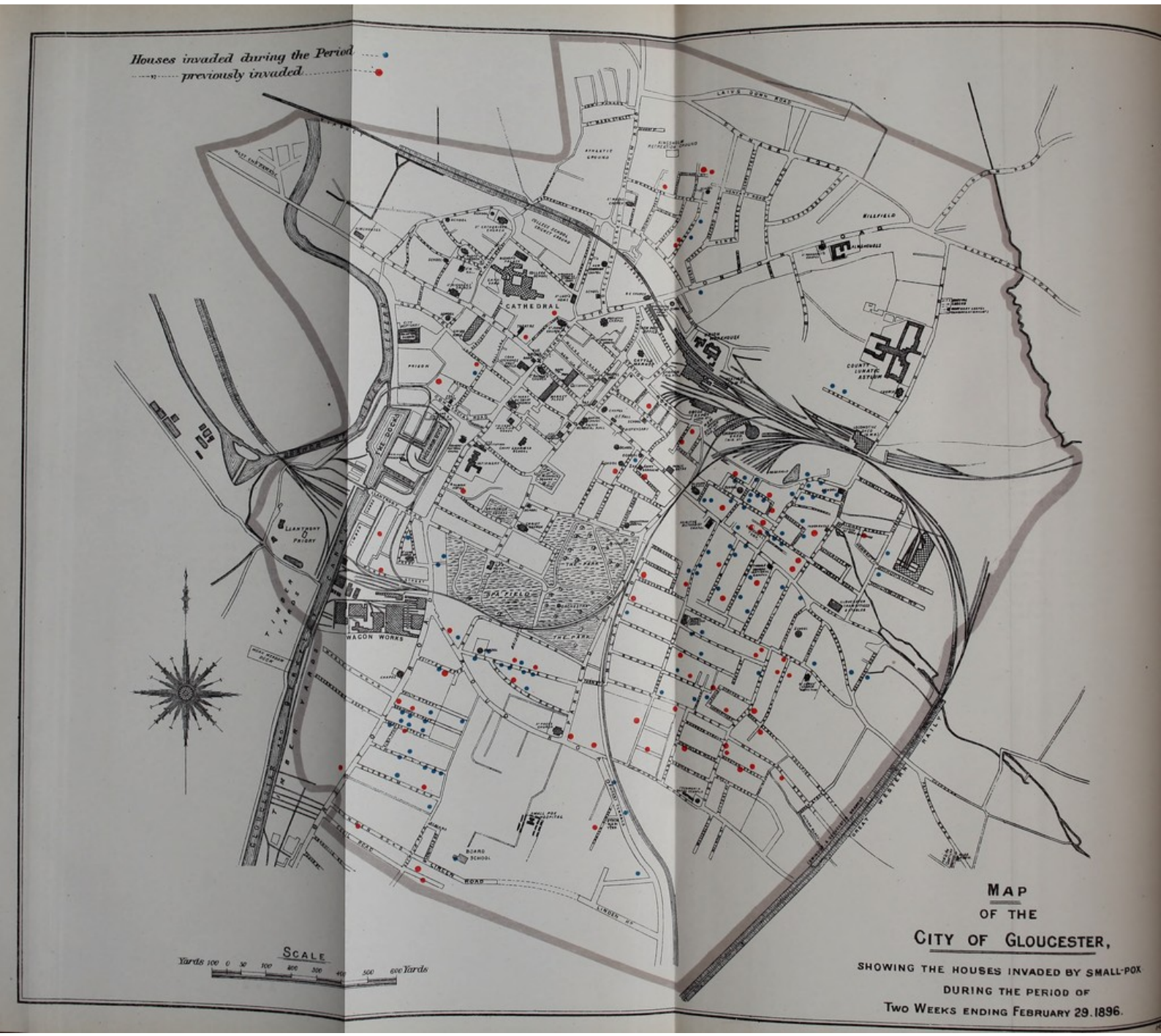
Total houses newly invaded - - - - - -	22
,, previously invaded - - - - -	49
	71

IV.



MAP
OF THE
CITY OF GLOUCESTER,

SHOWING THE HOUSES INVADED BY SMALL-POX
DURING THE PERIOD OF
TWO WEEKS ENDING FEBRUARY 15. 1896.



MAP
OF THE
CITY OF GLOUCESTER,

SHOWING THE HOUSES INVADED BY SMALL-POX
DURING THE PERIOD OF
TWO WEEKS ENDING FEBRUARY 29. 1896.

MAP V.

Houses invaded during the Fortnight ending February 29, 1896 (*see* page 40).

(a) *In Streets not previously invaded* (22).

Alfred Street, 2; Alma Place, 5; Barton Street, 6; Barton Terrace, 1; Dainty Street, 1; Eastend Road, 2; Forest Terrace, 2; Hopewell Street, 1; Jersey Road, 2; Ladybellgate, 1; Llandilo Street, 1; Magdala Road, 1; Magdala Terrace, 1; Midland Road, 1; Oxford Terrace, 1; St. Luke Street, 1; Salisbury Road, 1; Seymour Road, 2; Somerset Place, 2; Tweenbrook Villas, 1; Twyver Street, 3; Widden Street, 3.

(b) *In Streets previously invaded* (22).

Blenheim Road, 3; Brook Street, 1; Clegram Road, 1; Clifton Road, 1; Falkner Street, 2; Howard Street, 1; Linden Road, 1; Milbrook Street, 7; Napier Street, 4; New Street, 7; Regent Street, 1; Robin Hood Street, 4; St. Paul's Road, 1; Sherborne Street, 2; Sinope Street, 2; Stratton Road, 1; Stroud Road, 1; Theresa Street, 4; Upton Street, 1; Vauxhall Road, 2; Victoria Street, 4; Wellington Street, 1.

Total houses newly invaded - - - - - -	93
„ previously invaded - - - - -	71
	164

MAP VI.

Houses invaded during the Fortnight ending March 14, 1896 (*see* page 43).

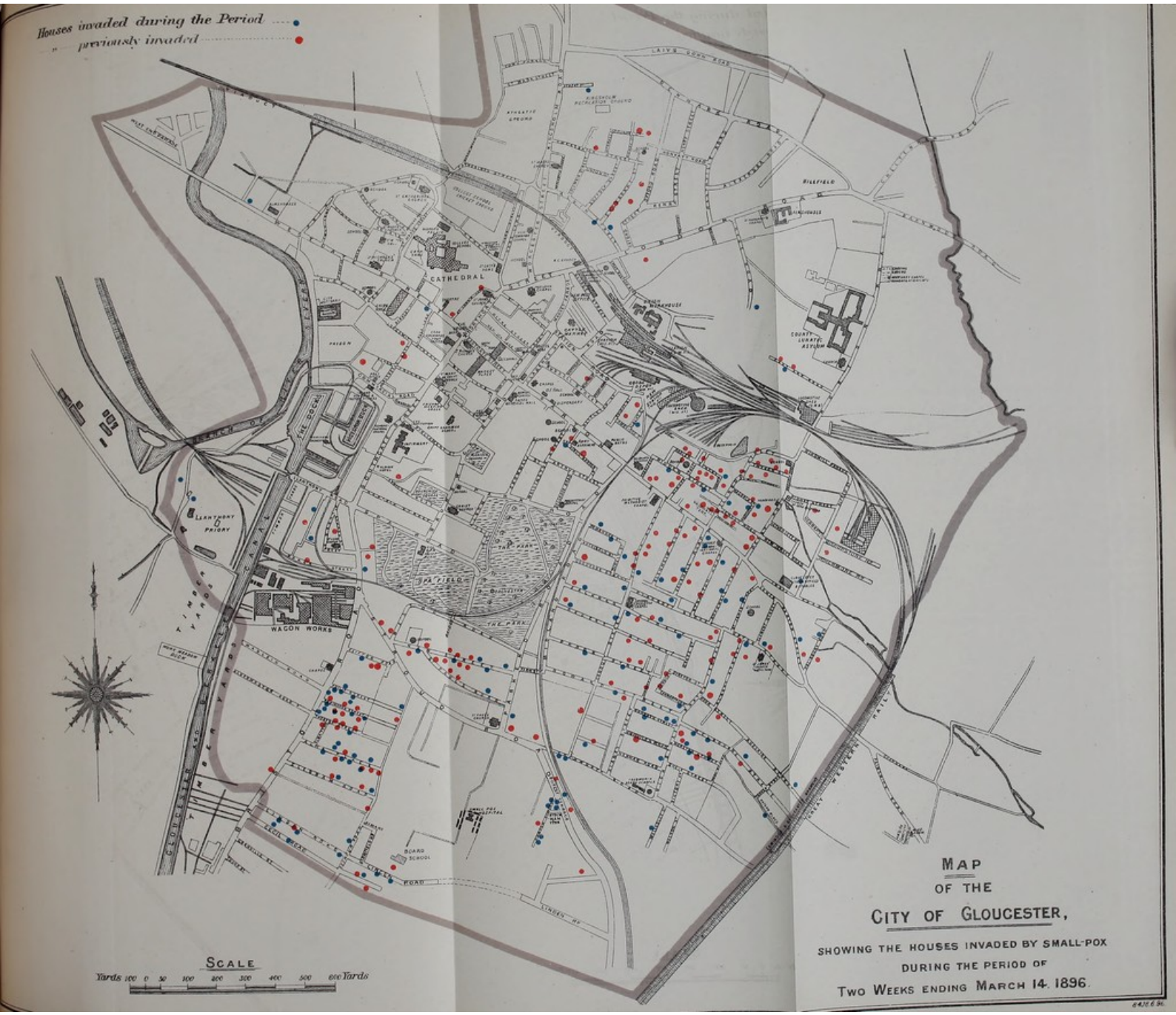
(a.) *In Streets not previously invaded* (20).

Adelaide Street, 1; Albert Street, 1; Alvin Street, 2; Dineley Street, 1; Ducie Street, 1; Exhibition Street, 1; Farnbrook Terrace, 1; Llanthony Cottages, 1; Llanthony Road, 1; Matson Place, 1; Morpeth Street, 4; Parkend Road, 1; Pembroke Street, 2; Philip Street, 5; St. James's Street, 1; Sebert Street, 1; Sydenham Terrace, 1; Tredworth Road, 2; Wellesley Street, 1; Westgate, 2.

(b.) *Streets previously invaded* (41).

Alfred Street, 1; Alma Place, 7; Barton Street, 1; Barton Terrace, 1; Blenheim Road, 1; Bristol Road, 2; Brook Street, 2; Carmarthen Street, 1; Castle Street, 5; Cecil Road, 3; Clegram Road, 2; Clifton Road, 1; Conduit Street, 3; Eastend Road, 1; Falkner Street, 3; Forest Terrace, 1; Hanman's Road, 1; High Street, 1; Hopewell Street, 2; Howard Street, 1; Linden Road, 6; Magdala Terrace, 2; Melbourn Street, 3; Milbrook Street, 1; Morton Street, 3; New Street, 5; High Orchard Street, 1; Raglan Street, 1; Regent Street, 2; Robin Hood Street, 6; Rycroft Street, 1; St. Paul's Road, 1; Salisbury Road, 1; Seymour Road, 2; Stratton Road, 1; Theresa Street, 2; Upton Street, 2; Vauxhall Road, 3; Victoria Street, 1; Wellington Street, 1; Widden Street, 2.

Total houses newly invaded - - - - - -	118
„ previously invaded - - - - -	164
	282



MAP
OF THE
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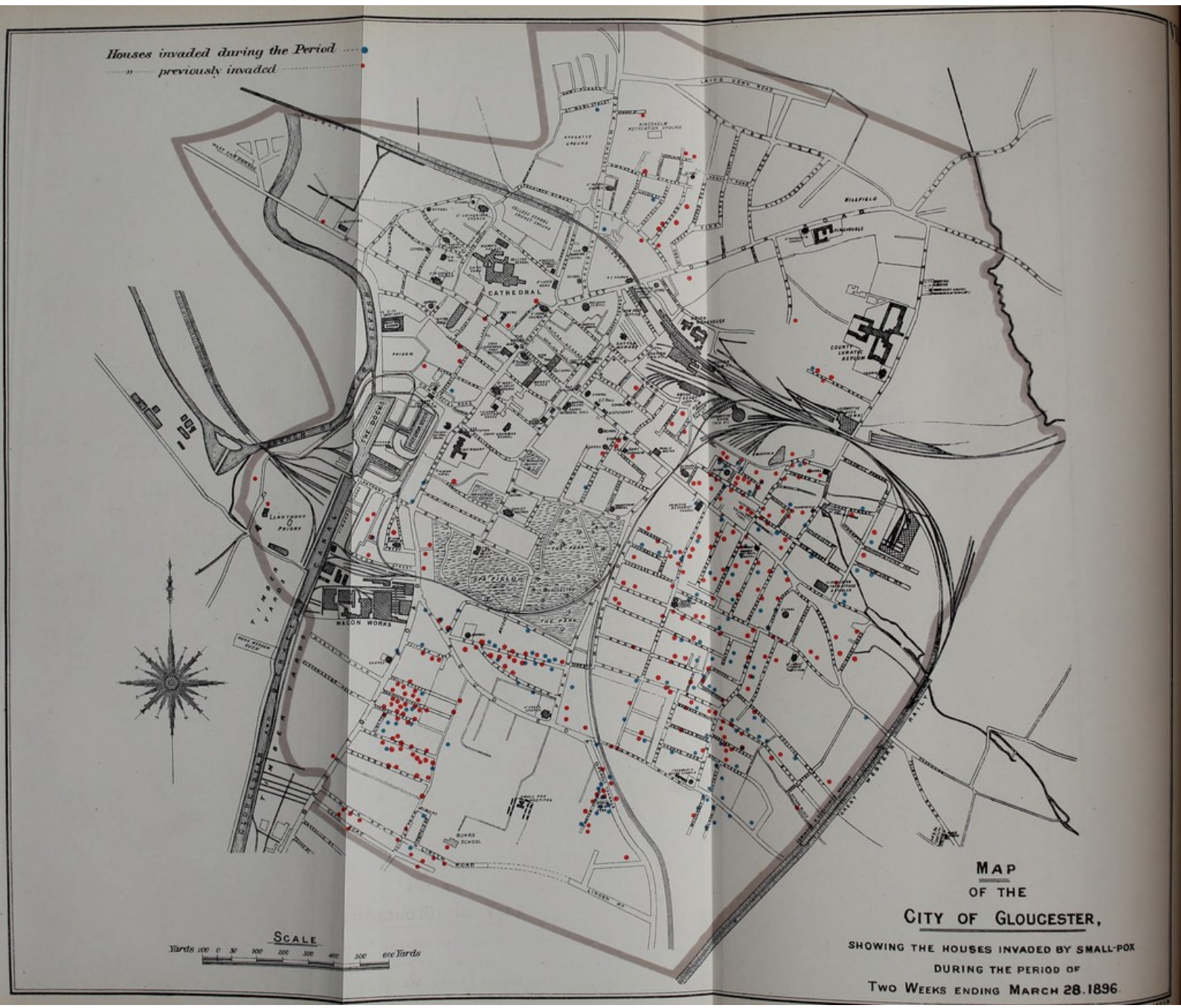
SHOWING THE HOUSES INVADED BY SMALL-POX
DURING THE PERIOD OF
TWO WEEKS ENDING MARCH 14. 1896.



MAP
OF THE
CITY OF GLOUCESTER,
SHOWING THE HOUSES INVADED BY SMALL-POX
DURING THE PERIOD OF
TWO WEEKS ENDING MARCH 28. 1896.

MAP VII.

Houses invaded during the Fortnight ending March 28, 1896 (*see* page 47).

(a.) *In Streets not previously invaded* (14).

Alma Terrace, 2; Archibald Street, 2; Birchmore Road, 1; Daventry Terrace, 1; Grove Street, 2; India Road, 2; Nelson Street, 3; Paul Street, 1; St. Mark Street, 1; Southgate, 1; Union Street, 1; Victory Road, 3; Weston Road, 2; Worcester Street, 1.

(b.) *In Streets previously invaded* (56)

Adelaide Street, 1; Alfred Street, 3; Alma Place, 1; Baker Street, 1; Barton Street, 4; Barton Terrace, 2; Blenheim Road, 1; Bristol Road, 1; Carmarthen Street, 2; Castle Street, 5; Cecil Road, 1; Clifton Road, 1; Conduit Street, 1; Dainty Street, 1; Derby Road, 1; Dineley Street, 1; Ducie Street, 1; Eastend Road, 1; Falkner Street, 1; Forest Terrace, 1; Hanman's Road, 3; Hopewell Street, 1; Howard Street, 2; Jersey Road, 2; Knowles Road, 1; Ladybellgate, 1; Llandilo Street, 1; Llanthony Road, 1; Magdala Road, 1; Melbourn Street, 3; Millbrook Street, 2; Moor Street, 2; Morpeth Street, 1; Morton Street, 2; Napier Street, 3; New Street, 9; Parkend Road, 1; Philip Street, 1; Regent Street, 2; Robin Hood Street, 2; Rycroft Street, 4; St. James's Street, 1; St. Paul's Road, 3; Seymour Road, 3; Sidney Street, 1; Sinope Street, 3; Stratton Road, 2; Stroud Road, 4; Sydenham Terrace, 3; Theresa Street, 2; Tredworth Road, 3; Vauxhall Road, 4; Victoria Street, 2; Wellesley Street, 3; Wellington Street, 1; Widden Street, 1.

Total houses newly invaded - - - - -	138
„ previously invaded - - - - -	282
	420

MAP VIII.

Houses invaded during the Fortnight ending April 11, 1896 (*see* page 51).

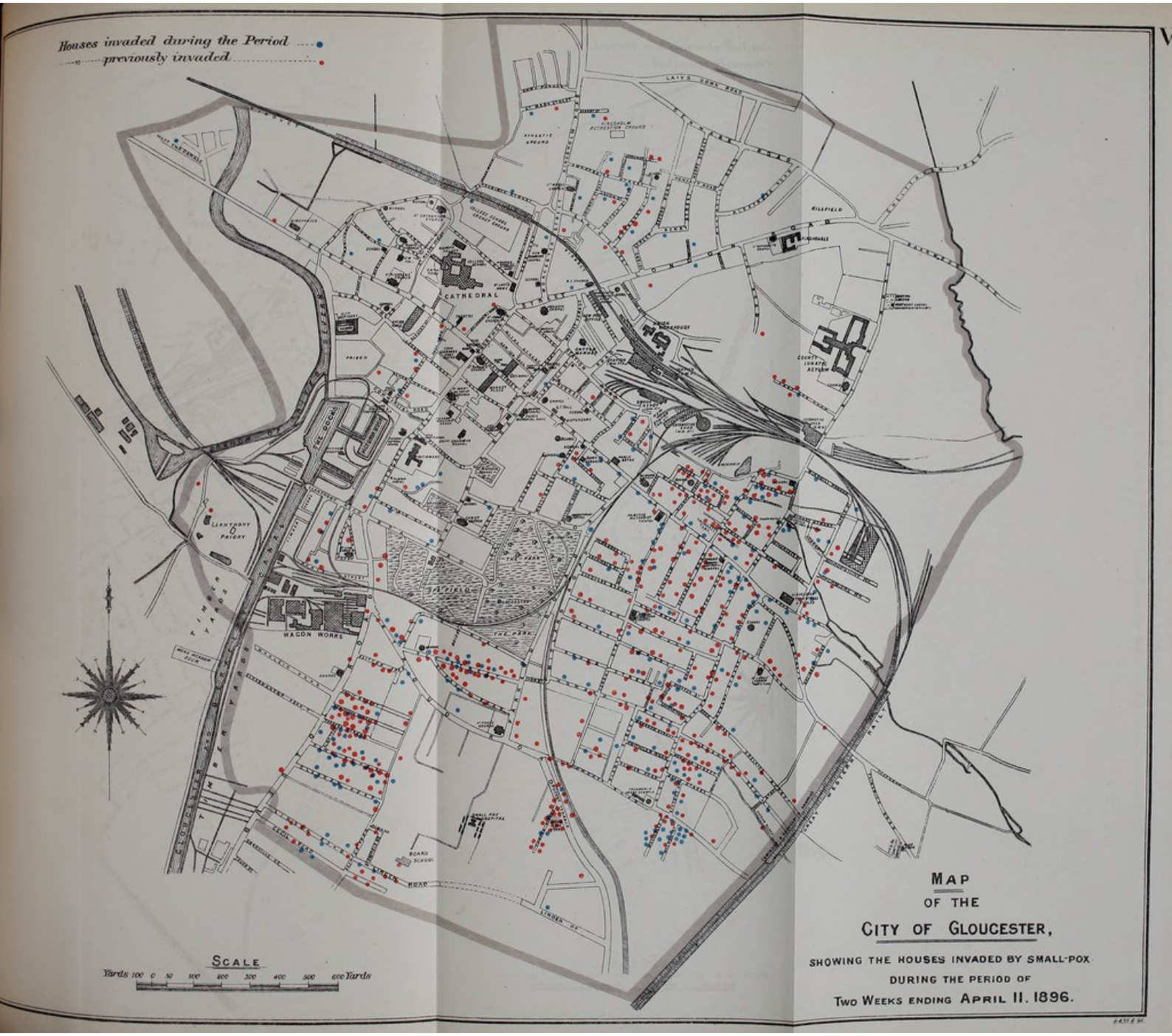
(a) *In Streets not previously invaded* (28).

Alexandra Road, 1; Arthur Street, 1; Bull Lane, 1; Cambridge Street, 1; Clarence Street, 1; Clement Street, 1; Clifton Terrace, 1; Henry Street, 1; Herbert Road, 1; London Road, 1; Mill Street, 2; Norfolk Street, 1; Northgate, 1; Park Road, 1; Parliament Street, 1; Portland Street, 1; St. Catherine Street, 2; St. Mary's Square, 1; Slaney Street, 1; Spa Road, 1; Suffolk Street, 1; Swan Lane, 1; Sweetbriar Street, 1; Old Tram Road, 2; West End Parade, 1; Windmill Parade, 1; Worcester Parade, 1; Worral Street, 1.

(b) *In Streets previously invaded* (73).

Albany Street, 1; Albert Street, 1; Alfred Street, 5; Alma Place, 12; Alma Terrace, 2; Archibald Street, 1; Baker Street, 1; Barton Street, 9; Barton Terrace, 1; King's Barton Street, 1; Blenheim Road, 1; Bristol Road, 1; Brook Street, 2; Carmarthen Street, 1; Castle Street, 3; Cecil Road, 2; Clegram Road, 5; Conduit Street, 1; Dainty Street, 1; Daventry Terrace, 1; Derby Road, 3; Ducie Street, 4; Dynevor Street, 3; Eastend Road, 1; Falkner Street, 1; Forest Terrace, 1; Guinea Street, 1; Hanman's Road, 2; High Street, 1; Hopewell Street, 5; Howard Street, 3; India Road, 4; Jersey Road, 1; Knowles Road, 2; Ladybellgate, 1; Linden Road, 6; Longsmith Street, 1; Magdala Road, 1; Melbourn Street, 3; Midland Road, 1; Milbrook Street, 4; Moor Street, 1; Morpeth Street, 1; Morton Street, 3; Napier Street, 2; Nelson Street, 7; New Street, 10; High Orchard Street, 2; Princes Street, 2; Regent Street, 4; Robin Hood Street, 5; Rycroft Street, 4; St. James' Street, 5; St. Mark Street, 1; St. Paul's Road, 2; Salisbury Road, 2; Sebert Street, 1; Seymour Road, 1; Sherbourne Street, 2; Southgate, 1; Stratton Road, 1; Stroud Road, 5; Theresa Street, 2; Tredworth Road, 4; Twyver Street, 2; Union Street, 1; Victoria Street, 6; Victory Road, 2; Wellesley Street, 7; Wellington Street, 2; Weston Road, 2; Widden Street, 1; Worcester Street, 1.

Total houses newly invaded - - - - - -	224
„ previously invaded - - - - - -	420
	644



MAP
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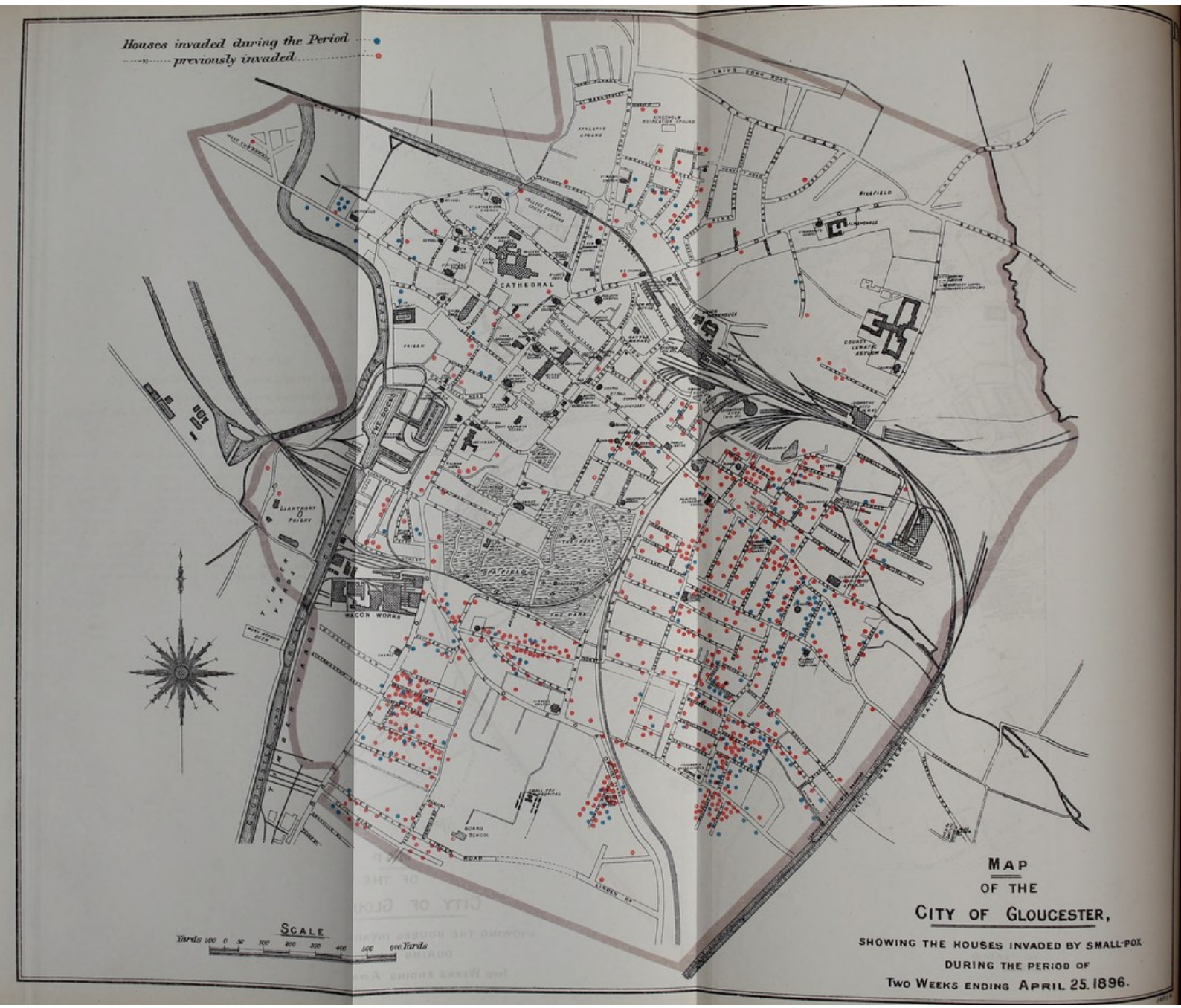
SHOWING THE HOUSES INVADED BY SMALL-POX
DURING THE PERIOD OF
TWO WEEKS ENDING APRIL 11. 1896.



MAP
OF THE
CITY OF GLOUCESTER,
SHOWING THE HOUSES INVADED BY SMALL-POX
DURING THE PERIOD OF
TWO WEEKS ENDING APRIL 25. 1896.

MAP IX.

Houses invaded during the Fortnight ending April 25, 1896 (*see* page 56).

(a) *In Streets not previously invaded* (6).

Bishopstone Road, 1; Blackfriars, 2; Church Street, 2; Hyde Lane, 1; St. Nicholas Terrace, 1; Priory Road, 1.

(b) *In Streets previously invaded* (66).

Albany Street, 3; Alma Place, 4; Alma Terrace, 1; Alvin Street, 3; Barton Street, 11; Barton Terrace, 1; King's Barton Street, 1; Birchmore Road, 1; Bristol Road, 3; Carmarthen Street, 5; Castle Street, 7; Cecil Road, 2; Clegram Road, 2; Clement Street, 11; Clifton Road, 3; Conduit Street, 4; Ducie Street, 5; Dynevor Street, 1; Exhibition Street, 1; Forest Terrace, 1; Hanman's Road, 1; High Street, 2; Hopewell Street, 4; Howard Street, 2; India Road, 1; Jersey Road, 1; Knowles Road, 1; Linden Road, 2; Llandilo Street, 1; Longsmith Street, 1; Magdala Terrace, 1; Matson Place, 2; Melbourn Street, 10; Milbrook Street, 3; Moor Street, 2; Morpeth Street, 1; Morton Street, 5; Nelson Street, 2; New Street, 7; Paul Street, 3; Philip Street, 1; Princes Street, 1; Raglan Street, 1; Robin Hood Street, 4; Rycroft Street, 2; St. James's Street, 10; St. Mary's Square, 1; St. Paul's Road, 2; Salisbury Road, 2; Seymour Road, 1; Sherborne Street, 3; Sidney Street, 1; Stratton Road, 1; Stroud Road, 5; Suffolk Street, 1; Swan Lane, 1; Theresa Street, 1; Tredworth Road, 5; Union Street, 3; Upton Street, 1; Victoria Street, 3; Victory Road, 8; Wellesley Street, 1; Wellington Street, 1; Westgate, 11; Worcester Parade, 1.

Total houses newly invaded - - - - -	202
„ previously invaded - - - - -	644
	846

MAP X.

Houses invaded during the Fortnight ending May 9, 1896 (*see* page 60).

(a.) *In Streets not previously invaded* (6).

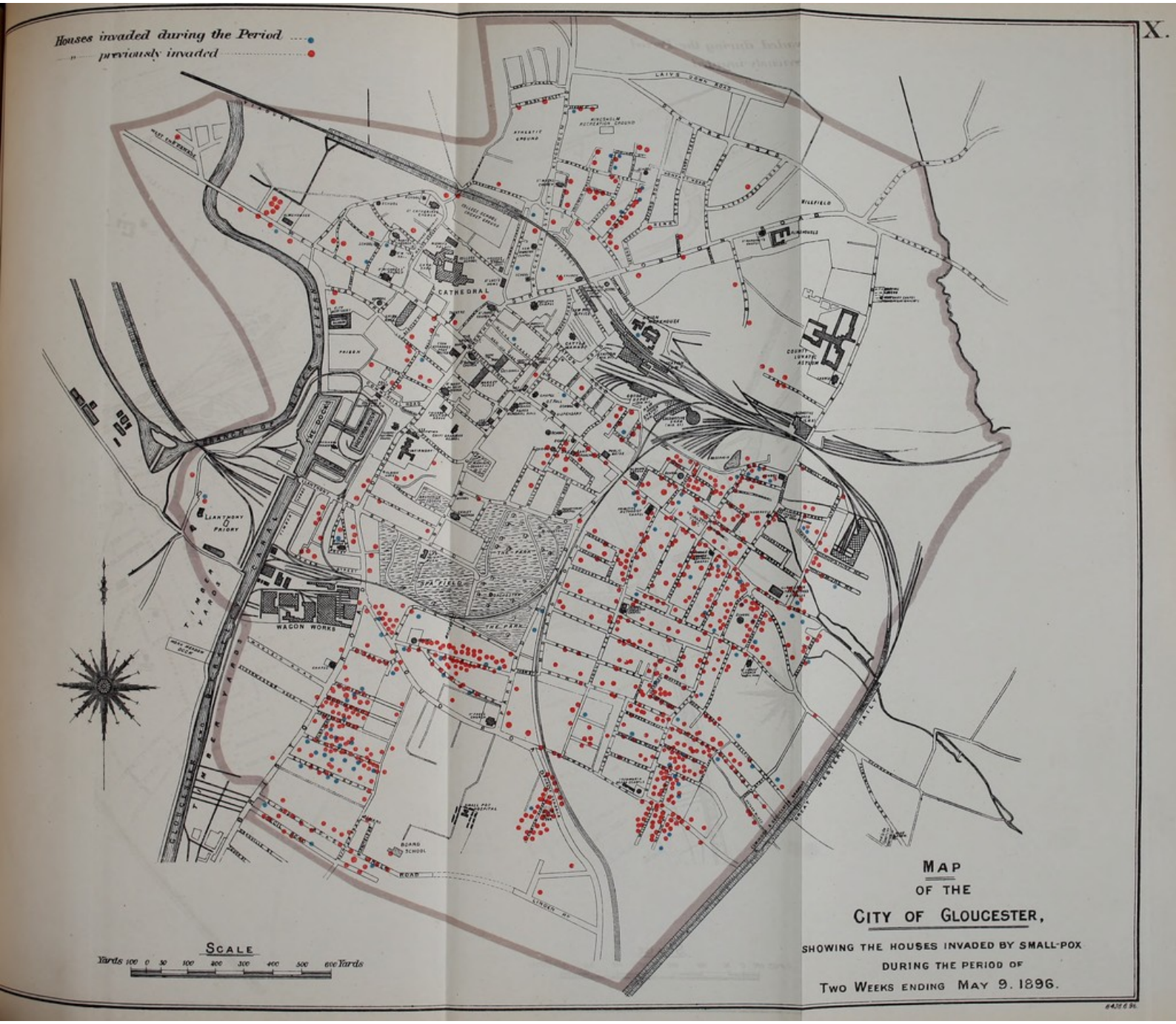
Chapel Street, 1; Deacon Street, 1; Hare Lane, 2: Mitre Street, 1; Russell Street, 1; "Union Workhouse," 1.

(b.) *In Streets previously invaded* (50).

Adelaide Street, 3; Alfred Street, 1; Alma Place, 11; Alma Terrace, 1; Barton Street, 6; Barton Terrace, 2; Birchmore Road, 1; Castle Street, 1; Cecil Road 2; Clegram Road, 4; Clement Street, 2; Clifton Terrace, 1; Ducie Street, 1; Herbert Road, 2; Hopewell Street, 1; India Road, 2; Knowles Road, 2; Linden Road, 1; Llandilo Street, 1; Llanthony Cottages, 1; Longsmith Street, 1; Melbourn Street, 1; Milbrook Street, 3; Morton Street, 1; Nelson Street, 2; New Street, 3; Parkend Road, 2; Philip Street, 2; Princes Street, 1; Robin Hood Street, 1; Rycroft Street, 2; St. James's Street, 1; St. Luke Street, 1; St. Paul's Road, 2; Salisbury Road, 1; Sebert Street, 1; Sherborne Street, 3; Sinope Street, 1; Stroud Road, 2; Theresa Street, 1; Tredworth Road, 1; Twyver Street, 2; Upton Street, 1; Vauxhall Road, 1; Victoria Street, 1; Victory Road, 3; Westgate, 2; Weston Road, 1; Worcester Street, 1; Worrall Street, 3.

Total houses newly invaded - - - - - -	101
„ previously invaded - - - - - -	846
	947

X.



MAP
OF THE
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SHOWING THE HOUSES INVADED BY SMALL-POX
DURING THE PERIOD OF
TWO WEEKS ENDING MAY 9. 1896.

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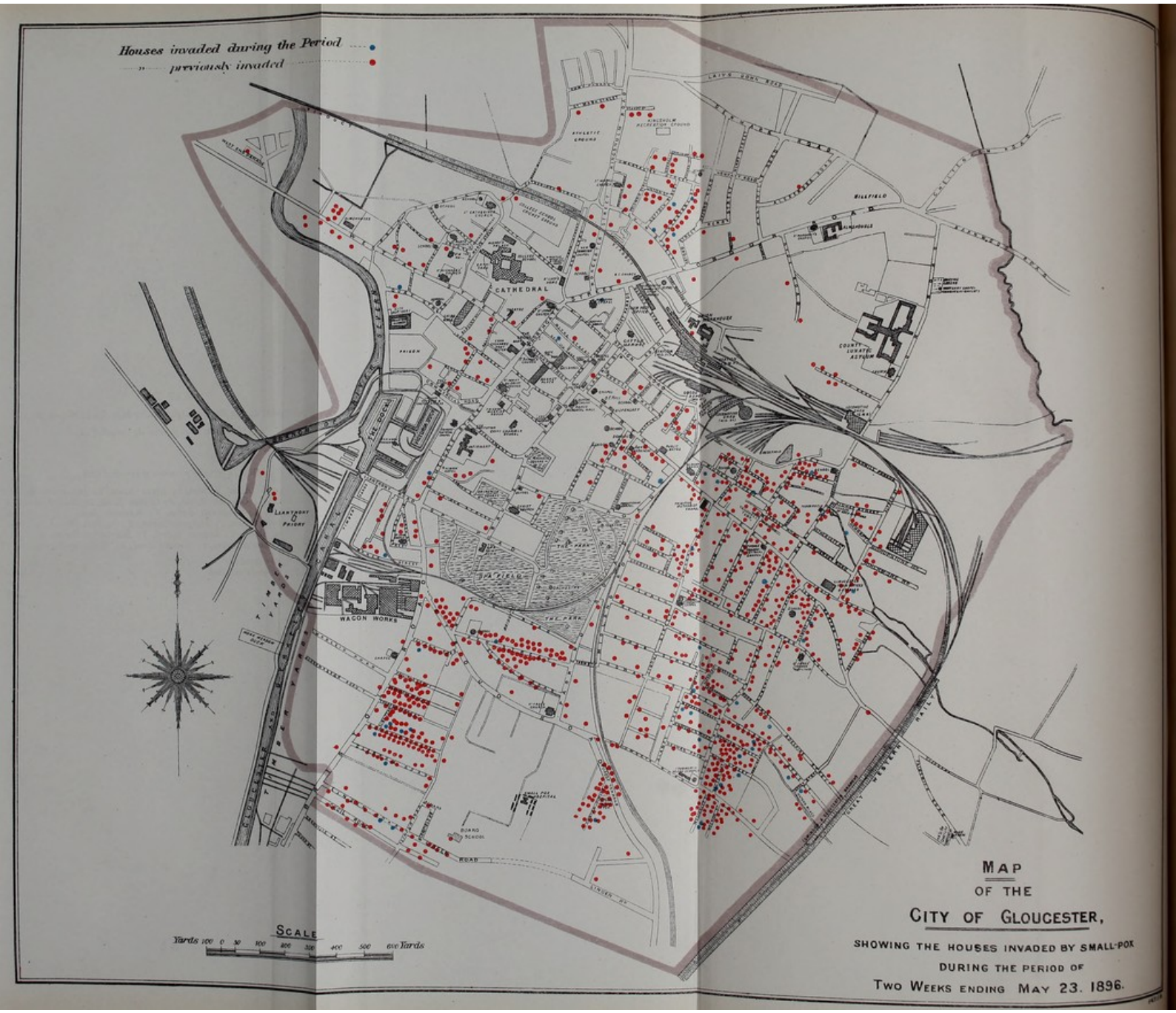


MAP
OF THE
CITY OF GLOUCESTER,
SHOWING THE HOUSES INVADED BY SMALL-POX
DURING THE PERIOD OF
TWO WEEKS ENDING MAY 23. 1896.

MAP XI.

Houses invaded during the Fortnight ending May 23, 1896 (*see* page 62).

(a.) *In Streets not previously invaded* (2).

Charles Street, 1; Quay Street, 1.

(b.) *In Streets previously invaded* (35).

Alfred Street, 1; Alma Place, 4; Alma Terrace, 1; Alvin Street, 1; Baker Street, 1; Barton Terrace, 1; Castle Street, 1; Clegram Road, 1; Clement Street, 2; Clifton Road, 1; Dainty Street, 1; Derby Road, 1; Ducie Street, 1; Herbert Road, 1; Hopewell Street, 1; Knowles Road, 1; Linden Road, 2; Melbourn Street, 3; Mitre Street, 1; Moor Street, 1; Morpeth Street, 2; Morton Street, 2; Nelson Street, 1; New Street, 1; Northgate, 1; Park Road, 1; Regent Street, 1; Sherborne Street, 2; Southgate, 1; Suffolk Street, 1; Twyver Street, 1; Victoria Street, 1; Victory Road, 2; Wellesley Street, 1; Widden Street, 2.

Total houses newly invaded - - - - - - -	49
„ previously invaded - - - - - -	947
	996

MAP XII.

Houses invaded during the Fortnight ending June 6, 1896 (*see* page 64).

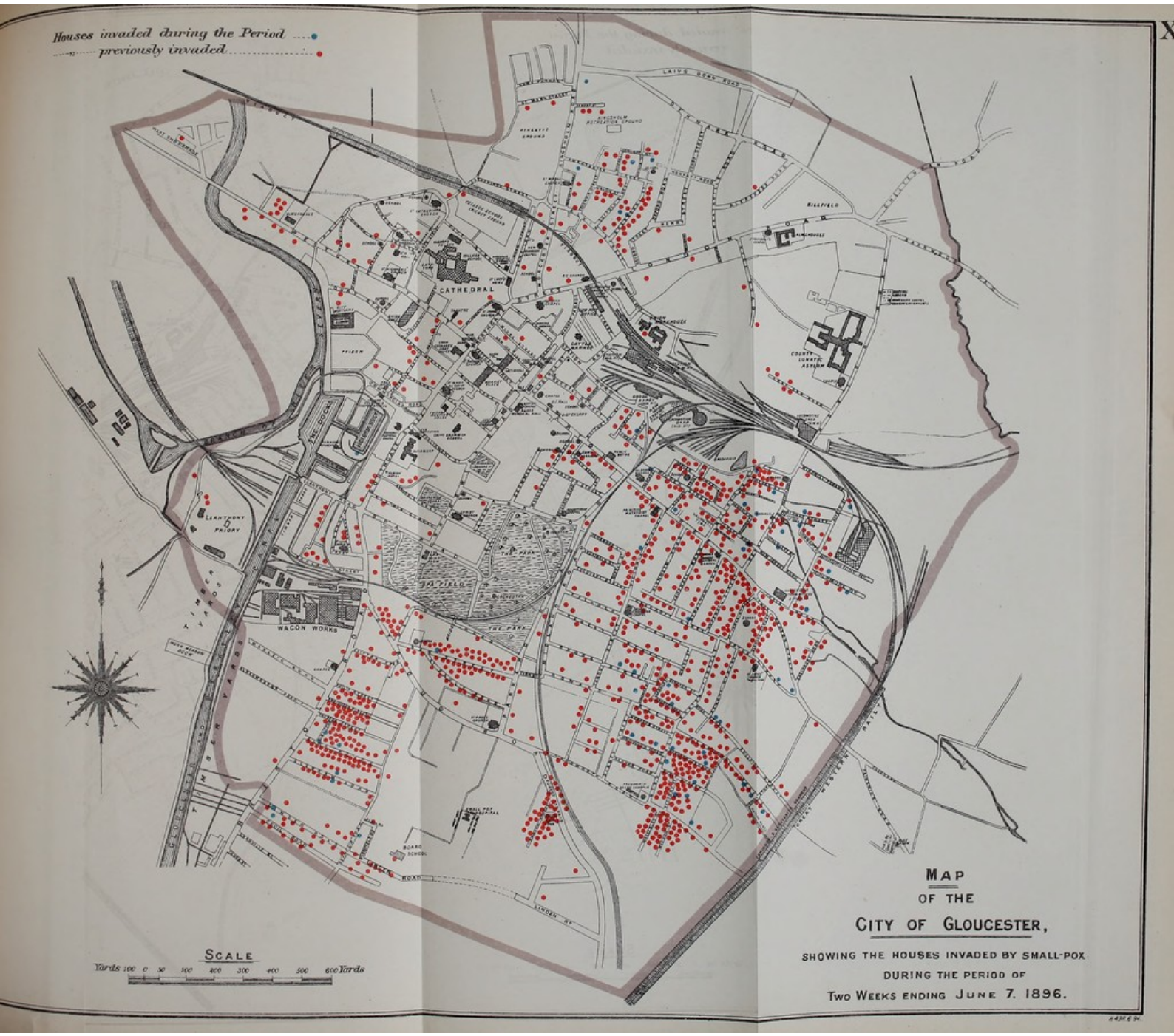
(a) *In Streets not previously invaded* (3).

Docks, 1; Gardiner's Row, 1; Hethersett Road, 1.

In Streets previously invaded (41).

Albany Street, 1; Albert Street, 1; Alfred Street, 1; Alma Place, 3; Barton Street, 1; Birchmore Road, 2; Brook Street, 2; Carmarthen Street, 1; Cecil Road, 1; Charles Street, 1; Clegram Road, 2; Counsel Street, 1; Dainty Street, 1; Derby Road, 2; Ducie Street, 1; Dynevor Street, 1; Herbert Road, 1; High Street, 2; India Road, 1; Jersey Road, 1; Knowles Road, 2; Linden Road, 1; Magdala Road, 2; Melbourn Street, 3; Milbrook Street, 1; Moor Street, 2; Morton Street, 2; New Street, 1; Rycroft Street, 1; Seymour Road, 1; Sherborne Street, 1; Sidney Street, 1; Sinope Street, 1; Suffolk Street, 1; Sweetbriar Street, 1; Tredworth Road, 1; Twyver Street, 1; Upton Street, 1; Victoria Street, 1; Victory Road, 2; Worrall Street, 1.

Total houses newly invaded - - - - - -	58
,, previously invaded - - - - - -	996
	1,054



MAP
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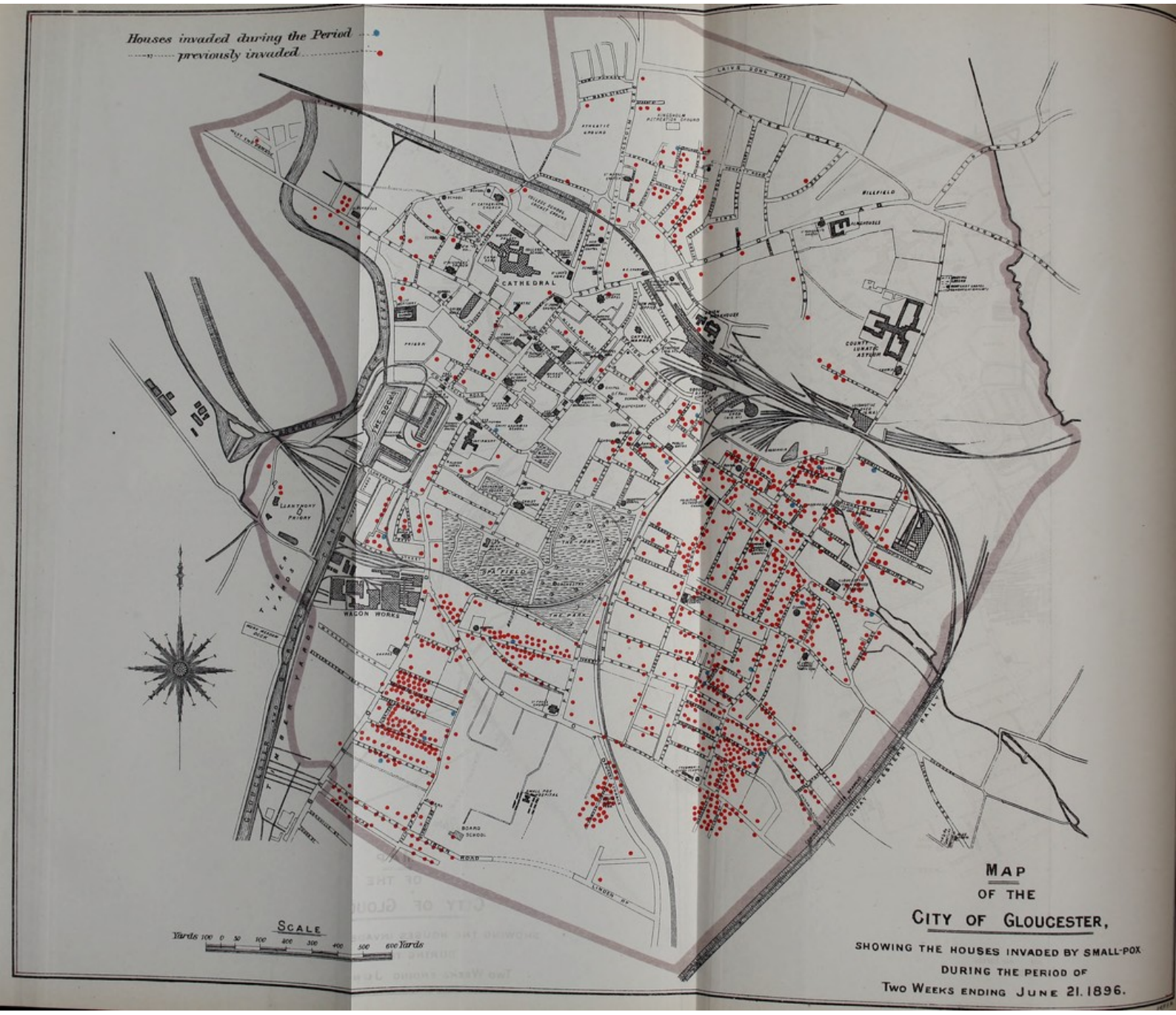
SHOWING THE HOUSES INVADED BY SMALL-POX
DURING THE PERIOD OF
TWO WEEKS ENDING JUNE 7. 1896.



MAP
OF THE
CITY OF GLOUCESTER,
SHOWING THE HOUSES INVADED BY SMALL-POX
DURING THE PERIOD OF
TWO WEEKS ENDING JUNE 21. 1896.

MAP XIII.

Houses invaded during the Fortnight ending June 20, 1896 (*see* page 66).

(a.) *In Streets not previously invaded* (0).

(b.) *In Streets previously invaded* (19).

Albert Street, 1 ; Alma Place, 1 ; Barton Street, 1 ; Barton Terrace, 1 ; Clegram Road, 1 ; Clement Street, 1 ; Dainty Street, 1 ; Dynevor Street, 1 ; Exhibition Street, 1 ; High Street, 1 ; India Road, 1 ; Magdala Road, 1 ; Millbrook Street, 1 ; New Street, 1 ; Parliament Street, 1 ; Paul Street, 2 ; Seymour Road, 1 ; Windmill Parade, 1 ; Worrall Street, 1.

Total houses newly invaded - - - - -	20
,, previously invaded - - - - -	1,054
	1,074

MAP XIV.

Houses invaded during the Fortnight ending July 4, 1896 (*see* page 67).

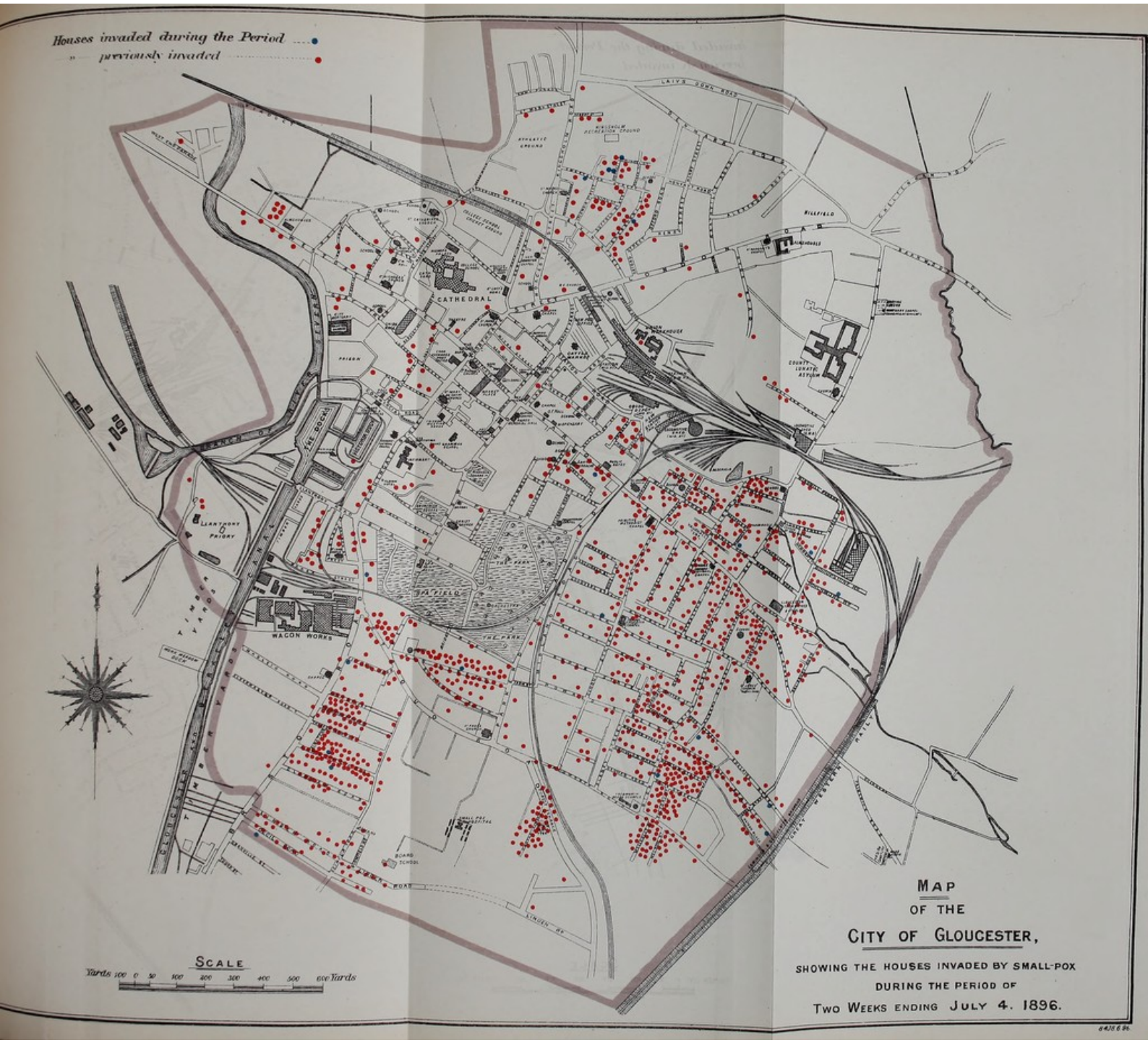
(a.) *In Streets not previously invaded* (1).

Percy Street, 1.

(b.) *In Streets previously invaded* (17).

Adelaide Street, 1; Alma Place, 2; Barton Street, 1; Birchmore Road, 1; Cecil Road, 1; Clifton Road, 1; Counsel Street, 1; Falkner Street, 1; Herbert Road, 1; High Street, 1; Magdala Terrace, 1; Melbourn Street, 1; New Street, 1; Sherborne Street, 1; Southgate, 1; Sweetbriar Street, 1; Worrall Street, 2.

Total houses newly invaded - - - - - -	20
„ previously invaded - - - -	1,074
	1,094



MAP
OF THE
CITY OF GLOUCESTER,
SHOWING THE HOUSES INVADED BY SMALL-POX
DURING THE PERIOD OF
TWO WEEKS ENDING JULY 4. 1896.

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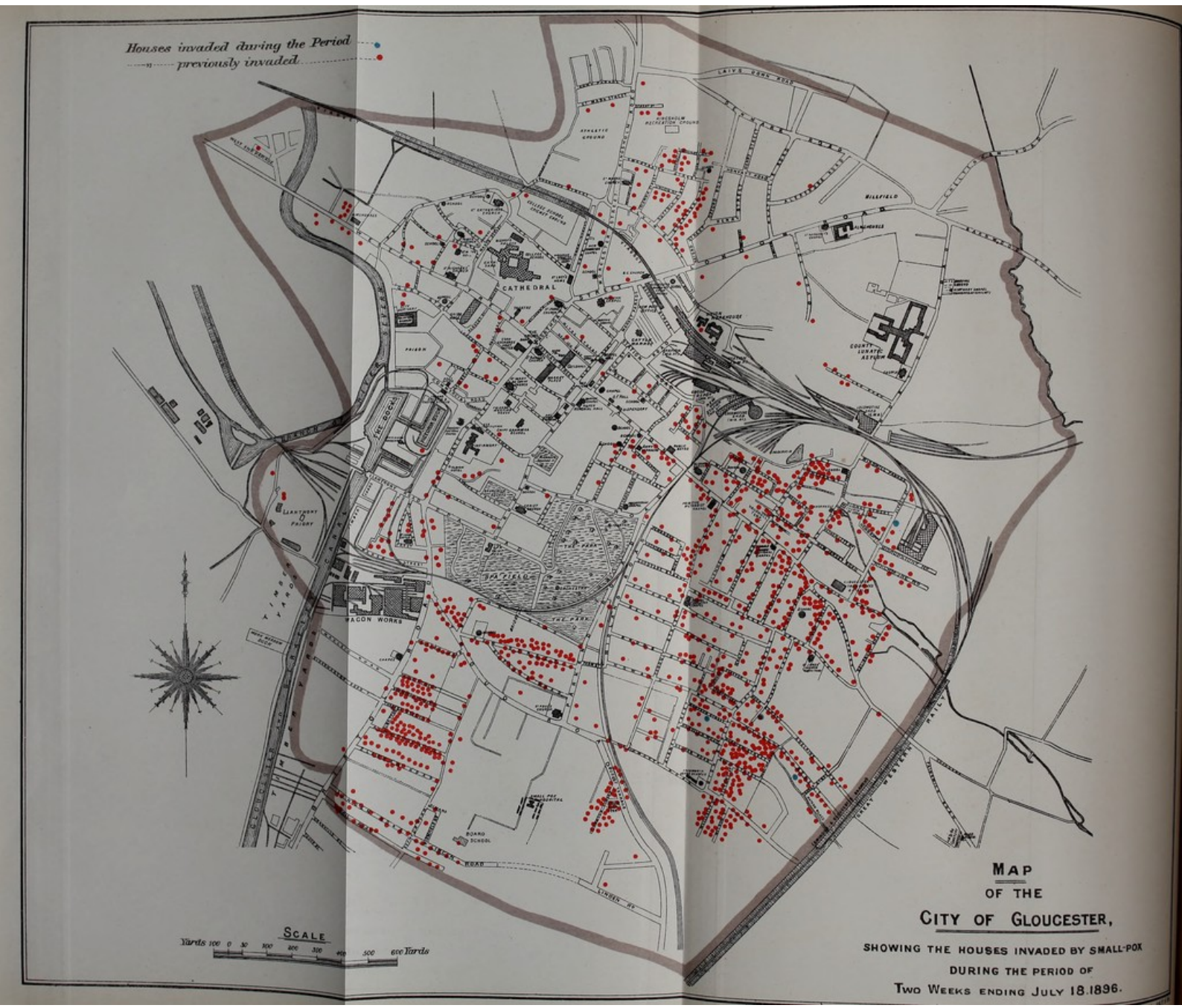


MAP
OF THE
CITY OF GLOUCESTER,

SHOWING THE HOUSES INVADED BY SMALL-POX
DURING THE PERIOD OF
TWO WEEKS ENDING JULY 18.1896.

MAP XV.

Houses invaded during the Fortnight ending July 18, 1896 (*see* page 68).

(a) *In Streets not previously invaded* (0).

(b) *In Streets previously invaded* (4).

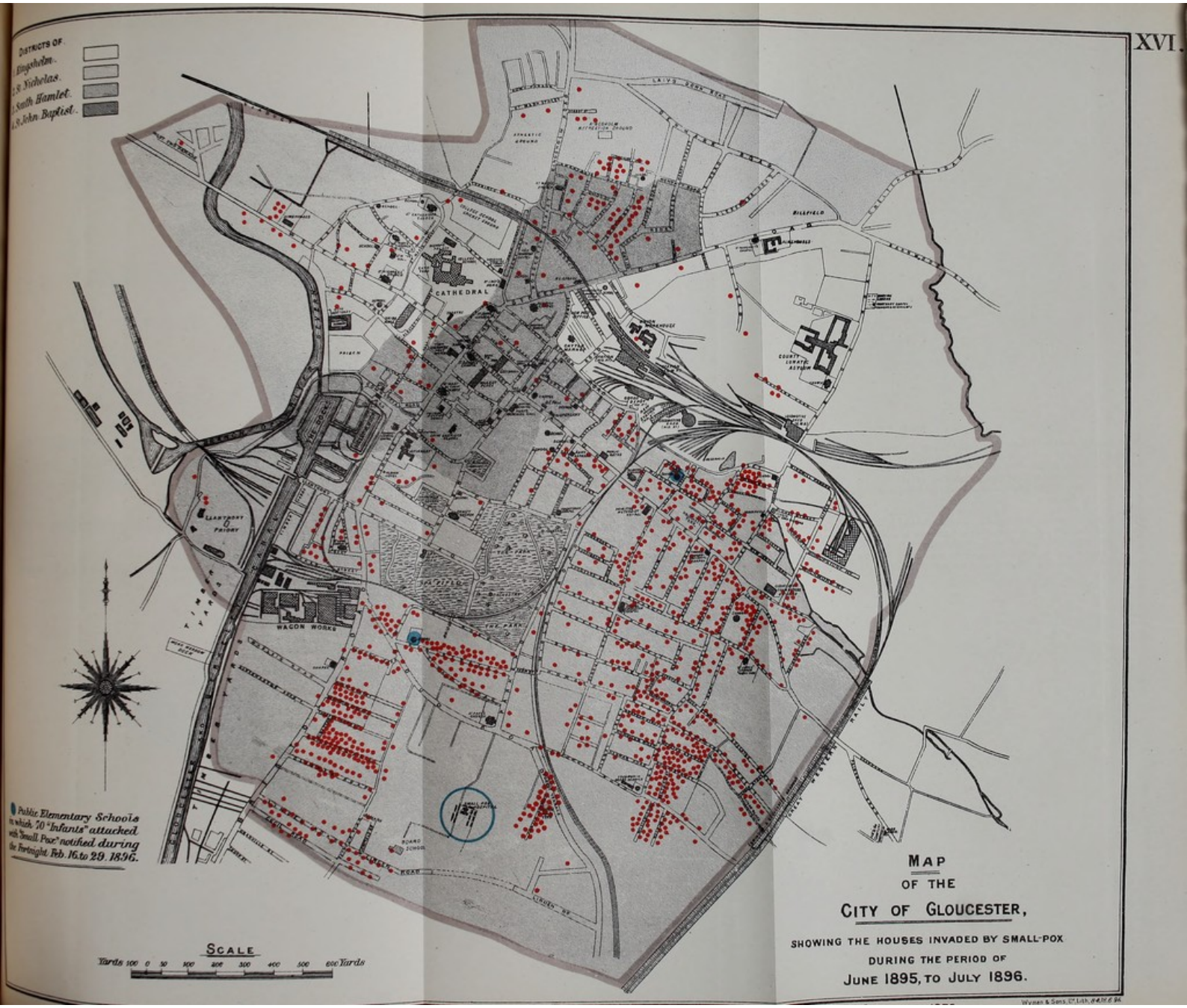
Alfred Street, 1; Melbourn Street, 1; Morpeth Street, 1; Percy Street, 1.

Total houses newly invaded	4
,, previously invaded	1,094
	1,098

MAP XVI.

This map is intended to show the distribution of the houses invaded by small-pox throughout the epidemic in relation to density of population. The four districts of the city are given, their respective population density being indicated by depths of shading, the most populated being the darkest shaded, and the least densely peopled being left unshaded. These districts are (1) *Kingshoim*, with a population density of about 10 persons per acre. In this district there were 51 houses invaded by small-pox, yielding 90 cases. (2) *St. Nicholas*, with a population density of about 21 persons per acre. In this district there were 45 houses invaded, yielding 64 cases of small-pox. (3) *South Hamlet*, having a population density of about 31 persons per acre. In this district there were 933 houses invaded, yielding 1,715 cases of small-pox. (4) *St. John Baptist*, the oldest part of the city, having a population density of about 64 persons per acre. In this district there were 69 houses invaded, yielding 110 cases of small-pox.

In this map are also specially indicated the sites of the Widden Street and St. Luke's (New Street) Schools, where many children were infected by small-pox in the fortnight ending February 29, 1896.


DISTRICTS OF.
1. Kingsholm.
2. St. Nicholas.
3. South Hamlet.
4. St. John Baptist.
CATHEDRAL
WAGON WORKS
LLANTHONY PRIORY
BILLFIELD
COUNTY LUNATIC ASYLUM
Public Elementary Schools in which 70 "Infants" attacked with "Small Pox" notified during the Fortnight Feb. 16. to 29. 1896.
SCALE
Yards 100 0 50 100 200 300 400 500 600 Yards
MAP
OF THE
CITY OF GLOUCESTER,
SHOWING THE HOUSES INVADED BY SMALL-POX
DURING THE PERIOD OF
JUNE 1895, TO JULY 1896.
Wyman & Sons, Ltd. Lith.

VACCINATION COMMISSION.

APPENDIX VIII.

TO THE

FINAL REPORT

OF THE

ROYAL COMMISSION ON VACCINATION.

REPORTS TO THE COMMISSION OF

DR. SIDNEY COUPLAND

ON THE PREVALENCE OF SMALL-POX IN GLASGOW, LIVERPOOL, SALFORD, MANCHESTER, OLDHAM, CHADDERTON, LEEDS, SHEFFIELD, HALIFAX AND BRADFORD IN 1892-3, AND THE MEASURES ADOPTED BY THE LOCAL AUTHORITIES.

Presented to both Houses of Parliament by Command of Her Majesty.
1897.



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APPENDIX VIII.

Reports on the Prevalence of Small-Pox in Glasgow, Liverpool, Salford, Manchester, Oldham, Chadderton, Leeds, Sheffield, Halifax, and Bradford, with an account of the Measures adopted by the Local Sanitary Authorities.

Introduction.

The annexed reports were made at the request of the Chairman of the Royal Commission on Vaccination in the year 1893, with the object of ascertaining the nature and extent of the outbreak of small-pox then prevailing in each of the places visited, and to describe the measures taken by the sanitary authority to deal with the outbreak.

The dates of the several visits were:—1, *Glasgow*, January 14, 1893; 2, *Liverpool*, January 20, 1893; 3, *Salford*, January 23 and February 21, 1893; 4, *Manchester*, January 23 and February 20, 1893; 5, *Oldham* and *Chadderton*, January 31, 1893; 6, *Leeds*, February 4, 1893; 7, *Sheffield*, February 10, 1893; 8, *Halifax*, February 13, and April 17, 1893; 9. *Bradford*, September 18, and October 20, 1893.

In most of these towns small-pox had prevailed more or less throughout the previous year, and it continued to spread for some months subsequent to my visits. The reports do not therefore embrace the whole of the epidemics, but in the cases of Bradford and Manchester I have been enabled, by the courtesy of the medical officers of health, to extend the accounts of the outbreaks for several weeks later than the date of the inquiry.

To each account is appended a complete list of the cases of small-pox (then known to the authorities) which are analysed in the body of the Report. The actual periods covered by these returns are, in each instance, as follows:—

	Cases.
I. Glasgow, July 1892 to January 1893 -	107
II. Liverpool, January 1892 to January 1893	206
III. Salford, September 1892 to January 1893	49
IV. Manchester, March 1892 to August 1893	805
V. Oldham, January 1892 to January 1893	124
Chadderton, March 1892 to January 1893	89
VI. Leeds, April to December 1891 - -	48
,, January 1892 to February 1893 -	200
VII. Sheffield, March 1892 to February 1893	60
VIII. Halifax, March 1892 to April 1893 -	330
IX. Bradford, May to December 1892 -	25
,, January to November 1893 -	658
	2,701

In each of these towns, with the exception of Leeds, compulsory *notification* of infectious diseases was in force. In Leeds the sanitary authority was informed of the occurrence of such diseases partly through the weekly returns of the registrar of deaths, partly through voluntary notification of sickness by medical men.

In each of these towns there was provision for the *isolation* of small-pox patients, in some by means of hospitals specially devoted to this disease, in others by the temporary appropriation of the whole or part of hospitals for the reception of cases of other infectious fevers. Thus at the time of my visits small-pox cases were isolated at Glasgow in the special small-pox wing of the Belvedere Fever Hospital; in Liverpool at the Parkhill Fever Hospital, which was entirely given up to small-pox; at Salford in a special small-pox hospital at Mode Wheel (temporary); at Manchester in (*a*) the special blocks of the Monsall Fever Hospital, and (*b*) in a temporary hospital at Clayton Vale; at Oldham and Chadderton in the Westhulme Fever Hospital (closed to fever cases); at Leeds in a special hospital at Stoney Cross (subsequently transferred to Manston); at Sheffield in the well isolated hospital at Lodge Moor (used for fever at other times); at Halifax in special wards at the Stoney Royd Fever Hospital (closed to fever cases); at Bradford in the Leeds Road Fever Hospital (closed to fever cases), and at the Scholemoor temporary small-pox hospital.

It will be seen that in no place, except perhaps at Glasgow, did the amount of hospital accommodation permanently set aside for small-pox patients suffice for the needs of the epidemic, whereas in some places there was no such provision at all. Moreover, even where there was a permanent small-pox hospital, it was generally part of the general fever hospital, and under the same administration. At Leeds, however, the small-pox hospital was perfectly distinct from the fever hospital, but in most other places it was found in special blocks within the same curtilage as the fever blocks (Glasgow, Liverpool, Manchester, Bradford). In all such cases, and in others where no permanent small-pox wards existed, the occurrence of the epidemic necessitated the closing of wards to fever cases and their utilisation for small-pox, as at Liverpool, Oldham, Sheffield, Halifax, and Bradford, whilst at Salford, Manchester, Leeds, Halifax, and Bradford, further accommodation had to be found by the erection of temporary buildings. These experiences go to prove that even in places where the sanitary administration is of a high order, the sudden demand for hospital isolation of small-pox seriously disorganises the existing arrangements, and in most cases leads to the temporary suspension of the means of isolation of other infectious diseases.

The procedures adopted for the *removal* of the sick, the *disinfection* of houses, &c., were practically the same in all these places, although differences will be found to obtain in respect of certain particulars such as the destruction of books from public libraries, the prompt notification of school attendances and other points to be found detailed in the several reports.

The *quarantining* of inmates of infected houses was being carried out to a full extent at Leeds, where ample provision had recently been made for this purpose, so that infected families were kept under supervision (in buildings owned by the corporation) for a period of a fortnight subsequent to the removal to hospital of the small-pox case. At Glasgow there were also similar measures of quarantine in specially adapted buildings. The plan had also been adopted to a certain extent at Sheffield and Bradford. In places where the families could not be removed to quarantine buildings, the infected houses were visited daily by sanitary inspectors during the above-named period, in order to ensure the prompt removal of cases of small-pox that might arise subsequent to the first one.

Although these reports do not, in any case, present a complete record of the whole history of the epidemic, they nevertheless do afford some statistical material of value, in respect to the incidence of the disease, its fatality, and its relations to vaccination. The appended tabular statement (A) shows that of the total number here dealt with, 2,701 small-pox cases, 249 were fatal or 9·2 per cent.

O 95250. Wt. 4309.

A.—Small-Pox. Ages and Mortality.

	1.		2.		3.		4.		5.				6.				7.		8.		9.				Total.	
	Glasgow.		Liverpool.		Salford.		Manchester.		Oldham.		Chadderton.		Leeds.				Sheffield.		Halifax.		Bradford.					
	1892-3.		1892-3.		1892-3.		1892-3.		1892-3.		1892-3.		1891.		1892-3.		1892-3.		1893.		1892.		1893.			
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Under 1 year	1	1	2	2	2	1	7	3	1	—	3	1	2	—	4	2	—	—	8	5	—	—	11	6	41	21
1 to 5 years	4	—	6	3	4	1	25	5	16	3	10	2	3	—	3	1	—	—	23	9	3	1	28	10	119	35
5 „ 10 „	4	—	10	1	3	—	25	2	10	2	8	2	4	1	8	—	4	—	12	1	—	—	35	7	123	16
10 „ 15 „	8	—	24	2	3	—	80	2	14	—	8	—	7	—	11	—	5	—	15	1	1	—	57	6	233	11
15 „ 20 „	13	—	38	2	4	—	109	3	15	1	12	1	6	—	25	—	10	—	37	2	2	—	82	2	353	11
20 „ 30 „	35	2	70	—	18	1	264	10	31	2	29	1	14	—	80	3	23	2	95	3	11	1	265	15	873	40
30 „ 40 „	30	3	25	3	10	3	167	16	15	2	11	1	6	—	48	3	12	1	76	6	5	1	137	16	542	55
40 „ 50 „	11	2	18	1	3	1	84	10	11	4	6	1	5	—	12	—	2	—	43	7	2	1	66	10	263	37
50 „ 60 „	1	—	1	—	2	—	28	4	4	1	1	—	—	—	6	1	2	—	15	1	1	—	21	5	82	12
60 „ 70 „	—	—	7	1	—	—	12	1	2	1	1	—	1	—	3	1	2	—	6	2	—	—	13	3	47	9
70 and over	—	—	2	—	—	—	2	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	5	—	10	—
Age not recorded	—	—	3	1	—	—	2	—	10	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	15	2
	107	8	206	16	49	7	805	56	124	17	89	9	48	1	200	11	60	3	330	37	25	4	658	80	2,701	249

B.—Vaccination Conditions of Small-pox Cases.

	Vaccinated.		Unvaccinated.		Other Classes.*		Total.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
1. Glasgow. 1892–3	91	4	2	1	14	3	107	8
2. Liverpool. 1892–3	177	6	19	7	10	3	206	16
3. Salford. 1892–3	38	4	10	3	1	—	49	7
4. Manchester. 1892–3	658	28	88	19	59	9	805	56
5. Oldham. 1892–3	79	8	32	8	13	1	124	17
5. Chadderton. 1892–3	66	2	18	6	5	1	89	9
6. Leeds. 1891	37	—	5	1	6†	—	48	1
6. Leeds. 1892–3	154	2	20	7	26	2	200	11
7. Sheffield. 1892–3	48	2	6	—	6	1	60	3
8. Halifax. 1892–3	261	10	55	25	14	2	330	37
9. Bradford. 1892	22	2	3	2	—	—	25	4
9. Bradford. 1893‡	498	31	128	42	32	7	658	80
	2,129	99	386	121	186	29	2,701	249

* Under this are included those of whom no information as to vaccination was obtainable, or in which there was no evidence of an alleged vaccination, and also those who were undergoing primary vaccination when attacked.

† Includes four cases (not in hospital) of which no record.

‡ Comprises only those cases in hospital which had been discharged or died.

Of those attacked—

41 were under 1 year of age, of whom 21 died, or 51·2 per cent.

242 were from 1 to 10 years, of whom 51 died, or 21·07 per cent.

1,459 were from 10 to 30 years, of whom 62 died, or 4·25 per cent.

944 were 30 years and upwards, of whom 113 died, or 12 per cent.

15 were of ages not recorded, of whom two died.

The relative *incidence* or proportion to the whole number of cases at each age period was as follows:—Under 1 year, 1·5 per cent.; 1 to 10 years, 9 per cent.; 10 to 30 years, 54 per cent.; 30 years and upwards, 35 per cent.; and at unrecorded ages, 0·5 per cent. Whilst the proportion of deaths at each age-period to total deaths was:—Under 1 year of age, 8·4 per cent.; 1 to 10 years, 20·5 per cent.; 10 to 30 years, 25 per cent.; 30 years and upwards, 45·3 per cent.; and at unrecorded ages, 0·8 per cent.

The general statistics of the *vaccination* condition of all these cases of small-pox are to be seen in the accompanying tabular statement (B.). It will be seen that the numbers comprise "129 vaccinated subjects, of whom 99 died, or 4·6 per cent. There were 386 unvaccinated subjects, of whom 121 died, or 31·3 per cent. There remain 186 subjects, variously distributed amongst classes in which there was either no evidence of an alleged infantile vaccination, or no information at all was obtainable, or who were undergoing primary vaccination when attacked by small-pox. Of these 29 died, or 15·6 per cent.

I may add that several maps and diagrams were prepared in illustration of each report, but it has only been thought desirable to reproduce some of them.

Sidney Coupland.

London, January 1894.

FINAL REPORT.—APPENDIX VIII.

I.—Report on the Prevalence of Small-Pox at Glasgow, 1892-93.

CONTENTS.

§ 1.—*The Public Health of Glasgow :—*
- *Area and Population.*
- *Greater Glasgow : administrative and statistical Districts.*
- *Density of Population : Comparison of Districts.*
- *Zymotic Death-rate and its comparison with total Death-rate.*
- *The Improvement Trust—*
  - *Model Lodging-houses.*
  - *"Ticketing."*

§ 2.—*Sanitary Administration, especially with reference to Epidemics :—*
- *Historical Summary.*
- *Committee of Health*, 1870.
- *Central Offices.*
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  - *Return of Primary Vaccinations in Glasgow*, 1886-1890.
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§ 3.—*Small-pox in Glasgow*, 1870-1892.

§ 4.—*Small-pox in Glasgow*, 1892-1893 :—
- *Number of Cases. Age and Sex incidence. Mortality.*
- *Type of the Disease.*
- *Vaccination and Re-vaccination in relation to the Cases.*
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- *The Small-pox and Fever Hospital.*
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  - (a.) *Removal of those exposed to Infection to Reception House.*
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  - (c.) *Lodging-houses.*

In order to arrive at a clear comprehension of the means possessed by the city of Glasgow for dealing with epidemics of infectious disease in general, and with small-pox in particular, it seems desirable to preface the account of the present epidemic by a sketch of the sanitary administration of the city, and a brief survey of its zymotic history in recent years. With that object I have divided this Report into four sections, and have included in the form of an Appendix many details relating to various points in the inquiry. The first section deals with the history of the public health of Glasgow, the second with its sanitary administration, the third with the previous history of small-pox in the city, and the fourth with the present outbreak and the measures taken by the authorities to cope with it.

§ 1. *The Public Health of Glasgow.*

By the City of Glasgow (Municipal Extension) Act, which came into force on 1st November 1891, the area of the city was increased from 6,111 acres to 11,861 acres, and the population from 565,710 to 658,073. (*See Appendix I.*)

The additions thereby made to Old Glasgow included in the N.W., the districts of Maryhill (24th Ward), Kelmiside and Downshill (23rd Ward), and Hillhead (23rd Ward); of Fossil Park (25th Ward) to N. and N.E.; of Govanhill, Crosshill, Mount Florida, Langside, and Pollokshields (Wards 27 to 21) on the S. side of the river.

For statistical purposes the city is divided into 33 districts, which are gathered into seven larger districts, for the purposes of administration. Thus :—

Greater Glasgow : Administrative and Statistical Districts.

Administrative District.	*Statistical Districts.*
1. *Central* - - -	Includes :—Bl. Blythwood. 2. Exchange. 3. High Street and Closes (West). 6. High Street and Closes (East). 9. Monteith Row. 10. St. Andrew's Square. 11. Carlton Proper. 12. St. Enoch Square. 13. Broomfield. 14. Bridgegate and Wynds.
2. *Eastern* - - -	Includes :—5. Belgrave and Dennistoun. 7. Greenhead and London Road. 8. Barrowfield (Shettleston, added 1891).
3. *Northern* - - -	Includes :—2. Port Dundas. 4. St. Rollox. 15. Woodside. 16. Cowcaddens. Sp. Springburn, M. H. Maryhill, and Ward 25.
4. *Southern* - - -	Includes :—19. Kingston. 20. Lauriston. 21. Hutcheson Square. 22. Gorrals.
5. *Western* - - -	Includes :—17. Kelvinhaugh and Sandyford. 18. Anderston Proper.
6. *South Suburban* - -	Wards 17 to 21.
7. *North-western* - -	Wards 22 to 24.

The population of these several districts is given in much detail in a statistical work based on the Census Returns of 1891, and issued by Dr. Russell.* I have extracted some of

* Census 1891, Glasgow. Old Glasgow and its Statistical Divisions as at 5th April 1891. Greater Glasgow as constructed by the City of Glasgow Act, 1891.

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the columns given in Tables I. and XIV. of this work, which will be found in the Appendix (*see Appendix II.*), and I have also reproduced the outline map which is published with the book, indicating the administrative districts, and also by depths of shading the density of population in the several districts. (*See Map A.*) It will be observed that in three districts the population exceeds 300 persons to the acre, viz., St. Rollox, in Northern A.D., Bromfield and Calton Proper in the Central A.D.; then between 200 and 300 to the acre are—Cowcaddens (N.); High Street and Closes (West), and St. Andrew's Square (Central); Anderston Proper (W.), Barrowfield (E.), and Gorrals (S.). Between 100 and 200 these are—Blythwood, Exchange, High Street, and Closes (East), Bridgegate and Wynds (Central); Woodside (N.); Kingston, Lauriston, and Hutcheson Square (S.). Between 50 and 100 to the acre these are—Twenty-second Ward (N.W.); Port Dundas (N.); Belgrave and Dennistoun (E.); Seventeenth Ward* (S.E.). The remainder—12 districts have each 14—50 to the acre.

Density of population.

The following table is a summary of the results of this enumeration as regards each administrative district:—

TABLE I.

Administrative district.	Total acreage.	Total population.	Inhabited houses.	Persons per acre. (*a*)	Persons per house. (*b*)
Central - - -	906	111,691	21,791	123	5·125
Eastern - - -	2,172	143,039	30615	65	4·672
Northern - - -	2,873	139,556	28,969	48	4·817
Southern - - -	939	127,258	26,927	135	4·726
Western - - -	753	60,193	12,171	77	4·937
South Suburban - -	2,140	44,078	8,630	20	5·107
North Western - -	2,078	32,258	5,779	15	5·581
	11,861	658,073	134,882	55	4·872

(*a*.) Including Institutions and Shipping. (*b*.) Excluding Institutions and Shipping.

Zymotic death-rate.

There are many circumstances which serve to explain the prevalence of zymotic disease in Glasgow. The size of the City, the density of its riverside population, the habits and character of the latter, and the free communication with other countries owing to its position as one of the main ports of the kingdom, doubtless contribute largely to facilitate the introduction of such diseases and promote their diffusion. The appended tables† give in a compact form the extent to which these diseases have prevailed during the 36 years ending 1890.

TABLE II.

Comparison of Zymotic and general death-rates in Glasgow.

	Zymotic death-rate.	Total death-rate.
6 years, 1855–60 - - -	6·1	30·0
10 „ 1861–70 - - -	6·5	30·4
10 „ 1871–80 - - -	4·3	28·6
10 „ 1881–90 - - -	3·1	24·4

TABLE III.

Mean annual mortality from Zymotic disease in Glasgow.

	Mean population.	Mean annual deaths, all causes.	Typhus and Enteric.	Small-pox.	Scarlet Fever.	Measles.	Whooping Cough.	Diphtheria.
6 years, 1855–60 - -	373,133	11,176	457	232	462	368	618	152
10 „ 1861–70 - -	420,082	13,226	872	100	567	341	647	285
10 „ 1871–80 - -	519,680	14,423	94 | 213	81	310	365	649	267
10 „ 1881–90 - -	539,588	13,132	25 | 124	2·6*	264	367	609	287

* 26 deaths in 10 years.

It will be seen that although there has been a general diminution in the death-rate from zymotic diseases, the chief improvement is in typhus and enteric fevers, small-pox and scarlet fever. Thus, stated in per-centages of the mean annual mortality from all causes, we have the following rates for each of these diseases during the periods named:—

TABLE IV.

Deaths from Zymotic disease in proportion to deaths from all causes.

	Typhus and Enteric.	Small-pox.	Scarlet Fever.	Measles.	Whooping Cough.	Diphtheria.
	%	%	%	%	%	%
1855–60 - - -	4·09	2·07	4·13	3·26	5·52	1·35
1861–70 - - -	6·59	0·75	4·28	2·57	4·89	2·15
1871–80 - - -	2·12	0·56	2·15	2·53	4·51	1·85
1881–90 - - -	1·13	0·02	2·01	2·79	4·69	2·18

* The precise number given is 40 persons per acre, but I have included it in this group.

It will be seen subsequently when I come to speak of the sanitary administration of Glasgow that the progressive diminution in the general and zymotic death-rates, as shown in the foregoing tables, has proceeded *pari passu* with the growth and development of the sanitary organisation. There is, however, another important factor which has contributed largely to the improved health of the city, and which will doubtless do still more in this direction as time goes on. I refer to the work done by the Improvement Trust Committee, which was instituted by a special Act in 1866 (amended in 1871 and 1880), which has been instrumental in effecting a demolition of many houses in the most crowded localities, in widening streets, and in constructing new and improved dwellings.‡

The Improvement Trust.

In particular may be specified the improved system of model lodging-houses which have in great measure replaced the smaller tenements hitherto used for that purpose. Some of these new buildings erected by the Improvement Trust are under the direct control of the municipality, and others on a similar scale have been

† Report on the Municipal Hygiene of the City of Glasgow presented to the Seventh International Congress of Hygiene, London, 1891. (Transactions of the Congress, vol. xii. p. 26).

‡ For the history of this Trust see "Transactions of the International Congress of Hygiene," vol. xii. p. 73.

founded of late years by private enterprise. In the report presented to the Hygienic Congress it is stated that the "Improvement Trust and Streets Improvement Committee own 1,202 houses, of which 551 are one-room, "and 486 two-room houses. These accommodate 5,300 "persons. To these must be added the model lodging-"houses with their 2,000 inmates."

"*Model Lodging-houses.*—Between 1871 and 1879 the "Improvement Trust erected at a cost of over 87,000*l.* "seven model lodging-houses in as many industrial "centres of the city. They contain 2,092 beds, for the "most part arranged in private compartments with an "average of 400 cubic feet of space per bed. One of these "houses containing 125 beds is reserved for females. ". . . . The males pay 3½*d.* and 4½*d.* per night, the "females 3*d.* They are nearly always fully occupied and "yield a net return of fully five per cent. on their original cost. . . . ." (*loc. cit.*, p. 75.)

The evils of overcrowding have also been grappled with by the enforcement of a system of "ticketing" under the supervision of the Sanitary Department.* This method is succinctly described in the report of the Hygienic Congress as follows :—

"Under the 1862 Police Act all houses consisting of "not more that three apartments and having an aggre-"gate cubic space not exceeding 2,000 cubic feet may be "measured and the total contents with the number of "inmates allowed at the rate of one adult or two children "under 10 years for every 400 cubic feet (300 until the "Police (Amendment) Act of 1890) marked on a tin-plate "ticket which is affixed to the outer door. All houses so "'ticketed' may be visited at night, the inmates "counted, and householders, where a number in excess is "found, summoned before a magistrate and fined" (*loc. cit.*, p. 70–71).

§ 2. *Sanitary Administration, especially with Reference to Epidemic Disease.*

Again referring to the report presented to the International Congress of Hygiene, 1891, the leading features of the organisation of the Health Department may be summarised as follows :—This department is governed by a committee of the Town Council (or Police Commissioners)—a body of 77 members—75 of whom are elected. The sanitary progress of Glasgow "is chiefly recorded in "her successive Police Acts, which began in 1800, and "close for the present with the Glasgow Police (Amend-"ment) Act, 1890, which is a purely sanitary measure." The first steps taken to establish the present department consisted in a deputation being sent by the Committee on Nuisances in 1857 to large towns of England and Scotland to study their sanitary system. This resulted in the 8th Police Act, 1862, which was renewed and amended in 1866. In 1862 the Sanitary Committee was formed, and in 1863 the first Medical Officer of Health (Dr. W. T. Gairdner) was appointed. One of the first acts of the Committee was the foundation of a Washing and Disinfecting Establishment (1864) and of the first Epidemic Hospital in Parliamentary Road (1865).

In 1870 there was constituted a Committee on Health by the amalgamation of the Cleansing and Sanitary Committees, and it at once appointed a Chief Sanitary Inspector by whom the sanitary administration was organised. The city was divided into "administration districts" (*see ante*) by utilising the five police sub-divisions, each district being furnished with a district inspector, and a staff of inspectors of nuisances, lodging-houses, and "epidemic" inspectors. Since 1891 the inclusion of the two large suburban districts (north-western and south suburban) has necessitated an enlargement of this staff.

There are now two Medical Officers of Health, viz., Dr. James B. Russell, appointed 1872, and Dr. Archibald H. Chalmers, appointed in 1892. The Chief Sanitary Inspector is Mr. Fyffe, who is the executive officer.

The central office of the department is at No. 1, Montrose Street, and here the district inspectors (except those of the two suburban districts) attend daily to receive instructions from the medical officer. All the epidemic inspectors also attend at 4 p.m. to make their daily reports to the medical officer.

A local office has been established in each of the two suburban districts, viz., *South Suburban*, at 44, Victoria Road, South; *North-Western*, at Burgh Buildings, Hillhead. These local offices and each district police office are in direct telephonic communication with the Central Office at Montrose Street. GLASGOW.

As regards the work of the Department, certain matters, such as overcrowding, meat inspection, &c. are dealt with direct by the Central Office; but all other matters, *e.g.*, nuisances, epidemics, &c., are managed by each district for itself, subject, of course, to the general control of the Central Office.

The system of inspection as regards epidemic disease, which bears more immediately upon the matter of this Report, may be specially described. At the present time there are 13 *epidemic inspectors*, viz., two to each of the police districts of Old Glasgow, and one to each of the suburban districts, with the temporary addition of an extra inspector recently, owing to an extensive outbreak of scarlet fever. These officers do nothing else but attend to epidemic work. Each of them is provided with a telephonic call key, and it is his duty to call from time to time throughout the day at the police office of his district to receive information of any cases of epidemic disease that may have been notified in his district. He then proceeds to the house indicated and records details of the case referred to and the household in the note book furnished to him. (*See Appendix III.*) [This note book is presented by him at the close of the day, and the information it contains transferred to registers.] He at once communicates with the Central Office,* stating the nature of the case, and orders are issued for the removal of the patient to hospital, of the inmates to the Reception House (in the case of typhus and small-pox) and for the immediate disinfection of the house, clothing, &c.† Epidemic inspectors.

The Infectious Diseases (Compulsory Notification) Act was adopted by Glasgow as soon as it came into force, so that it has been working for just two years. But much information of the prevalence of zymotic diseases, especially of typhus and enteric fevers, was gained by the Sanitary Department, previous to the adoption of the Act, by furnishing medical practitioners with stamped forms. In addition to this source of information the epidemic inspectors have reported a large number (about one half) of the cases coming under the notice of the department. Every case as soon as notified is registered. (*See Appendix IV.*) Notification of infectious disease.

Isolation Hospitals.—There are two fever hospitals in Glasgow at the present time: one at Parliamentary Road, the other at Belvidere, on the extreme easternmost boundary of the city. Hospitals for Infectious Disease.

(*a.*) The Parliamentary Road Hospital‡ is built on the pavilion system; and was at first a temporary provision to provide accommodation for typhus fever in 1864–5. The hospital was opened in April 1865, containing 136 beds. It was decided in 1866 to maintain it permanently, and in 1869 was enlarged to 250 beds. It proved, however, inadequate for the needs of the city, and in 1870 the Belvidere estate was purchased, upon which, to meet the pressing needs of that time, temporary wooden pavilions were erected. The extension of buildings around the Parliamentary Road Hospital, and the suspicion that small-pox was disseminated in its vicinity, led in 1873 to the resolution to build a small-pox hospital at Belvidere. (*a.*) Parliamentary Road.

(*b.*) *Belvidere Fever and Small-pox Hospitals.*—The estate at Belvidere extends to about 32 acres. The temporary accommodation for fever patients made there in 1870 was supplemented, and finally replaced by permanent buildings. The first portion to be constructed was the Small-pox Hospital, which was opened in December 1877. It consists of five detached pavilions, each containing two separated wards, which can only be entered from the outside by a flight of steps and covered vestibule; the basement being 8 feet from the ground to floor level. The wards contain 15 beds each, the total accommodation for small-pox, amounting, therefore, to 150 beds. A detached building for the resident medical officer and nurses, and another for kitchens, &c., with ample recreation ground enclosed on all sides, renders the small-pox hospital entirely independent of the rest of the institution. The present resident officer is Dr. Marsh, and the visiting physician to the small-pox wards, Dr. Thomson. But until the present outbreak the cases of small-pox have been so few since the hospital was built, and the demand for additional fever accommodation so great, that 120 of the beds in the (*b.*) Belvidere.

* "Ticketed Houses of Glasgow." Presidential address to the Philosophical Society of Glasgow, by Dr. J. B. Russell, November 1885.

* The central office is open all day from 7 a.m., and if necessary (as during the cholera outbreak on the Continent last year), it is kept open throughout the night also.

† Although the subject of vaccination will be more fully dealt with hereafter, it may be convenient to state here that one of the duties of an epidemic inspector on visiting a case of small-pox, is (if there is no medical man in attendance, or the people are unable to pay a medical fee), to offer and perform re-vaccination on the rest of the household. For this purpose each such inspector is trained in the practice of vaccination, and carries with him a supply of lymph furnished by the department.

‡ As this hospital is no longer used for the reception of small-pox patients I did not visit it.

GLASGOW. small-pox pavilions have been utilised for scarlet fever; "only one pavilion barricaded off with the whole administration buildings for small-pox. A small staff is maintained there."* Since, however, the present epidemic commenced the barricade has been shifted to enclose two pavilions; and at the time of my visit (January 16th, 1893) the remaining wards had been wholly cleared of their fever inmates, and were about to be opened (for the first time) for the purpose for which they were originally constructed.

As regards the fever hospital proper I may be allowed to quote from the description given in Dr. Russell's chapter in the "Medical Institutions of Glasgow," which deals with these buildings.

"The whole buildings, except that occupied by the medical and nursing staff and matron, are built of brick. The wards are distributed in pairs, in 13 totally isolated pavilions, all running N. and S. They are 40 feet apart laterally, and are placed in rows of 2, 3, 4, and 4, in succession from the bank overlooking the Clyde, towards London Road. . . . Each pavilion is only one storey in height, with a well-ventilated basement beneath, so that the level of the ward is reached by a flight of steps. The two rows of four pavilions are separated by a range of buildings running E. and W., the centre of which contains the kitchen, one storey in height, and, like the pavilions, open to the roof. At either end there is another storey, the eastern accommodating various stores and the dispensary; the western, the under servants' bedrooms. At London Road there is a main lodge controlling to the W. the entrance to the Small-pox Hospital and to the E. the approach to the Fever Hospital. At the S. end of this approach is the fever lodge and enquiry rooms for patients' friends, with the Dorcas Society's stores in an attic storey, and running N. along the avenue, the morgue, with room for funeral parties, with entrance from the road, so that hearses, &c. do not come within the hospital enclosure. Just inside this gate is the washing house and laundry, with the suite of steam boilers to the S., a cremator for soiled beds, and the central coal depot. Further S. are a smithy, carpenter's shop, and fire-engine station. South-westward, some 40 yards, are the stables, ambulance shed, &c. Still westward is a large three-storey stone block, erected on the site of the old mansion house, containing 84 single bedrooms for nurses, with recreation rooms on each flat. These occupy the lateral wings, while the centre is reserved for the matron and medical staff. . . .

"There are 390 beds on the scale of 2,000 cubic feet for adults; but as a large proportion of the patients are children, for whom 1,200 cubic feet is sufficient, a much larger number of patients can be accommodated. The dimensions of every pavilion and ward are exactly the same; but as they were erected at different times sundry little but important differences exist. The two southern pavilions were built last, and the description of one will suffice. It has a basement 8 feet from ground to floor level. The outside length from end to end is 168 feet; the outside breadth 26 feet; the height from ground level to ridge of roof 32 feet. There are two wards, each divided into a convalescent and acute ward. A flight of steps on both sides gives access to a vestibule, from which, on one hand, are the entrances to these sub-divisions, while on the opposite side is the pantry, opening directly off the passage, and a lobby, to the left of which are the bath-room and watercloset, and to the right a steep room for soiled linen, these last being farthest from the wards. All these appurtenances are therefore completely isolated in a projecting annexe. The entrance and annexe of each ward are on opposite sides of the pavilion. On the side opposite to the entrance of the acute ward is a nurse's duty room, where there is a "poison press" and napery press with chairs and a table. The front projects into the ward with sloping roof and glass sides, giving a full view of the ward. . . . . The number of adult beds is 11 for the acute and 4 for the convalescent ward; but in the case of children 20 cribs are allowed.

"All the flooring of the wards is of Dantzic oak waxed. The vestibule and annexe are laid with tiles. The walls are coated with Keene's cement. Some wards are oil-painted and varnished, but the more recent are treated with light blue and green distemper, which can be frequently renewed. All the woodwork is varnished. Care is taken to avoid flat surfaces giving lodgment for dust. The principal rafters are, therefore, of light T iron, and the ties of thin rod iron. . . . . .

"The bedsteads are wrought iron, the tables and chairs hardwood varnished. In children's wards iron cribs are provided, and pigmy forms and tables suited to their size. All cupboards, presses, &c., are movable on iron rollers like American tanks. The mattresses are stuffed with straw, the pillows with chaff. They are renewed for any new patient and whenever soiled." . . .

"The nurses are graded in three classes, probationers, nurses, and head nurses. After a year's probation, during which she attends lectures on fever nursing given by the assistant physicians, the probationer is submitted to a written *viva voce* examination. If she passes satisfactorily she gets a 'certificate of proficiency in fever nursing,' first, second, or third class, signed by the physician-superintendent, and becomes a nurse. The wage of a probationer is 18*l.*, and advances gradually to 30*l.*, all getting two uniform suits per annum for ward use alone. To work a purely pavilion hospital such as Belvidere, all its parts distributed over a large area, and to maintain the large extent of flower garden and pleasure ground attached, requires a large staff. The distribution of coals is done by an open lorry, on which all the coal boxes are placed and driven round the wards. The food is distributed by a covered van divided into compartments, each of which holds the allowance for a ward. The ashes are collected daily from portable circular covered ashbins countersunk in the ground adjacent to each ward, an arrangement which contains convenience and perfect sightliness and inoffensiveness. The whole institution is under the care of a physician-superintendent, who is assisted in the general business of the hospital by a house steward, and in the medical charge by two permanent medical assistants. These are supplemented as occasion requires by extra assistants. In fact there are seldom less than three assistants, and usually in the autumn and winter there are four or five. These appointments are in great request among the best students of the Glasgow school. They are only given to qualified men, and by preference to such as have been house surgeons in either of our infirmaries. They remain from one to two years. The present physician superintendent, Dr. J. W. Allan, was appointed in August, 1875, and has contributed much by his urbanity, good management, and rich experience to win and to retain the confidence which Belvidere undoubtedly possesses with both the professors and the public."*

The allocation of the various wards for different classes of infectious disease is of course open to change from time to time, according to the prevalence of the particular kind of fever. On the accompanying plan (Pl. I.) the usual distribution of the wards is indicated, from information supplied to me by Dr. Chalmers. The laundry, baths, &c. are all on a large scale, and of the highest excellence. The "Enquiry Room" is a large hall, around which are small windows at a high level, each numbered with the number of a ward. At a given hour daily a nurse from each ward attends at the window to give information to any of the relatives or friends of the patients in the ward. A similar enquiry room exists for the small-pox hospital.

It is intended to erect in the north-western outskirts of the city, where a site has been secured, a hospital of the same style and proportions as Belvidere. The old hospital in Parliamentary Road will then be abolished.

Rec Hou Wea Stre

Reception Houses.—There are two houses in the city specially set apart for the reception of the families of those who are infected with typhus, but they are not restricted to that disease, and at the present time are being used for small-pox quarantine. The first, and for many years the only, reception house is situated in Weaver Street, in the heart of the city. It was devoted to this purpose in 1872. Standing in its own grounds, it is a one-storied building of stone, and at the time of my visit contained 35 inmates from infected households, 12 of whom were adults. On the ground floor, to the right of the entrance, is the day-room; to the left the matron's room, and at the end of the passage, the kitchen and offices. Adjacent to the next house is the bath-room, where every new-comer takes a bath, and is provided with fresh clothing before he enters the main building. His own clothes are sent to the sanitary laundry at Belvidere to be washed and disinfected. There are 24 beds in the five rooms on the first floor, one containing six beds, three containing five beds, and one three beds. Unless one family can fill a whole room, the sexes are kept separate. If a case of fever or small-pox occur among the inmates, the room which he occupied is dismantled and fumigated. There is a matron and servant in charge of the place, and direct telephonic communication with the Montrose Street Office. The building is an old one, and the bath accommodation defective. The sitting room is very barely furnished, and all the rooms

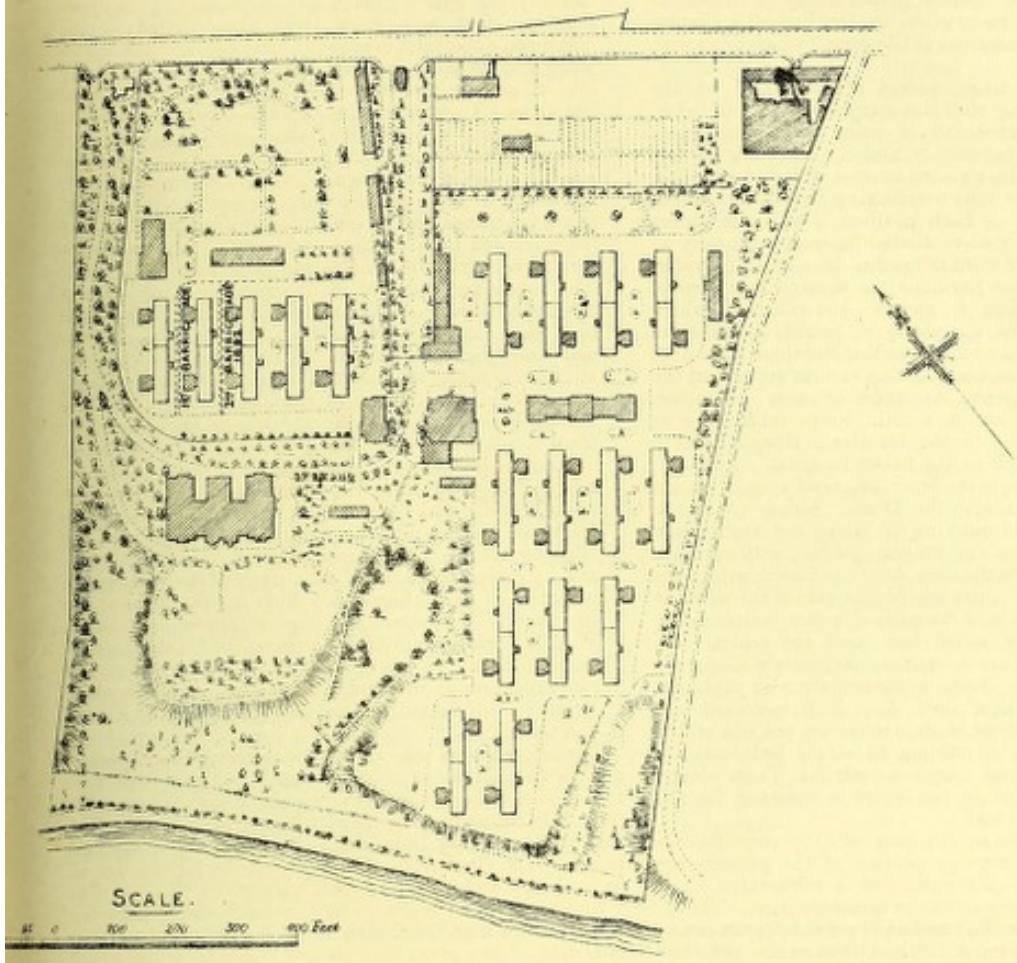
* City of Glasgow Fever and Small-Pox Hospitals, Belvidere. By Dr. James B. Russell. Reprinted from "The Medical Institutions of Glasgow." Glasgow: Printed by Alex. MacDougall, 1888.

* At the time of my visit Dr. Allan had recently vacated office; and his successor—Dr. Johnston, of Monsall Fever Hospital, Manchester—had not come into residence at Belvidere.

CITY OF GLASGOW HOSPITALS, BELVIDERE.

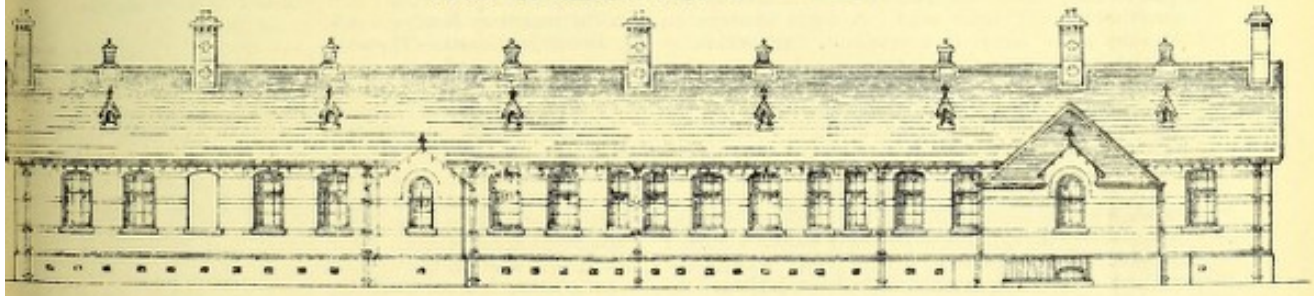
BLOCK PLAN.

DIAGRAM B.

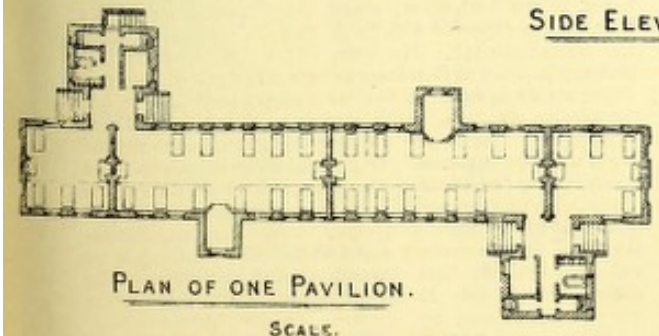


BELVIDERE HOSPITAL, GLASGOW.

PLAN OF ALTERATION OF WARDS.

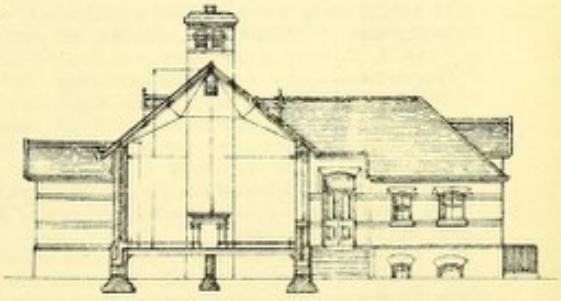


SIDE ELEVATION.



PLAN OF ONE PAVILION.

SCALE.



CROSS SECTION.

SCALE.

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are low; when full, it must be difficult of adequate ventilation. It is, however, kept as clean as possible.

ıth Street. The second and more recently acquired reception house is on the south side of the river, in South York Street. It is in every way more commodious and cheerful than the Weaver Street building. It stands on a larger plot of ground, surrounded by a high wall on three sides. Before its acquisition for its present purpose it was used as an orphanage, and has a large dormitory in one wing, containing 14 beds, with lavatory annexed, and a correspondingly large day room and dining hall below. In his Annual Report to the Health Committee on the sanitary condition of Glasgow in 1891, dated August 1892, the Chief Sanitary Inspector, Mr. Fyffe, records its acquisition, and thus describes it:—

"It is a self-contained house at 339, South York Street, "containing a basement, strut floor, upper flat, and attics. "The accommodation comprises two kitchens, a reception "room, a bath room, a dressing room, and a fumigation "chamber in the basement; a matron's room, servants' "room, one dormitory, a dining hall, and a pantry in the "strut floor. Upstairs there are four dormitories, a bath-"room, and two lavatories; the attic is a large room "capable of holding six beds; outside there is a wash-"house, lavatory, and coal cellar, &c. . . . The extent of "ground enclosed is 1,700 square yards, so that there is "plenty of air space about it, and area for walking and re-"creation." In all, 39 beds can be made up, viz.: dormitory, 14 beds; two rooms with five beds each; two with four beds each; one with one bed; and the attic with six beds. Straw mattresses are used. At the head of first flight of stairs is a sink and a w.c. in good order. The walls are painted, and the stone staircase and rooms kept very clean. The dining hall contains six tables; it is a lofty and well-lighted apartment. At the time of my visit there were 15 inmates, including four children. The new-comers enter by a side door at the right-hand corner of the basement, passing into the reception room, where they undress and proceed to the bath (which has been constructed in a blind passage between the door of the reception room and dressing room by the simple expedient of raising a brick and cemented wall about 2 feet high, and giving the "floor" a slightly concave surface by concrete.) From this bath the inmates proceed to the dressing room, which contains presses for the storage of clothes provided by the authorities, and also those belonging to the inmates after they have been returned from the laundry.

It is noteworthy that although, as a rule, the inmates are retained in the Reception House for a period of 14 days, those who are engaged in work are permitted to follow their avocation, as soon as their disinfected clothes are returned to them, and (in the case of small-pox) also after having been re-vaccinated.

As stated there is telephonic communication between both reception houses and the central office; and a register is kept by the matron of each house in which are entered the names, ages, addresses, and nationality of the inmate, with date of reception and discharge.

Sanitary laundry. *Washing and Disinfecting.*—The central sanitary laundry has been established in the N.E. corner of the Belvidere estate, occupying an area of 2,500 square yards. It was opened in 1883, prior to which one-half of the washing house of the fever hospital was used for the general purpose. There is a special service of vans to convey the infected clothing, bedding, &c., at once from the house to the laundry. (*See Appendix V.*) "There is a Lyon's disin-"fector, in which mattresses, clothing, &c., which cannot "be washed, are disinfected, a cremater for burning straw, "chaff, wool, flock, and other articles, 'where each is to be "burned,' and a carpet beating machine." (Dr. Russell. "Glasgow Fever and Small-pox Hospitals," p. 12, 1888.) Dr. Russell goes on to say that "it has just been resolved "(1888) to spend 800*l.* in improving the arrangements, "and especially in adding appliances, devised by the "Sanitary Inspector, for treating everything which is ulti-"mately to be washed with a solution of bichloride "of mercury, which it is expected will make the "articles inocuous before passing them on to the "washers."

Vaccinations in Glasgow. *Vaccination.*—Although the sanitary department does not have the duty of performing public vaccinations imposed on it, for that appertains in Scotland to the parochial boards; yet in order to maintain a stock of lymph for the purpose of re-vaccination in times of small-pox invasions, and also to assist in the vaccination of the community, it does a great share of this work; and has for the past 20 years maintained a vaccination hall at Montrose Street, the medical vaccinating officer during all this period being Dr. Neil Carmichael. I was fortunate to have the opportunity of an interview with Dr. Carmichael, and of also seeing his practice on one of the days set apart for vaccination. (*See Appendix VI.*)

Glasgow is a "well-vaccinated" city. There does not appear to be any overt objection to the enforcement of the law; the unvaccinated being mostly those who have escaped vaccination from the neglect or thoughtlessness of the parents.

TABLE V.

Glasgow, five years, 1886–1890; return as to vaccination, compiled from Registrar-General's (Scotland) Annual Summary.

Successfully vaccinated.	Vaccination postponed.	Insusceptible of Vaccine Disease.			Died before Vaccination.	Removed from district before Vaccination or otherwise unaccounted for.	Total Births.
		On the Ground of Constitutional Insusceptibility.	In respect of the Children already having had Small-pox.	On the Ground of previous successful Vaccination.			
83,245	593	144	—	850	9,984	2,458	97,274

It will be seen that from these figures only 2·5 per cent. of the infants born during the five years 1886–1890 were returned as having "removed from the district before "vaccination or otherwise unaccounted for."

The share taken by the Sanitary Office in the performance of public (primary) gratuitous vaccinations is shown in the following return for the year 1888, kindly furnished me by Dr. Russell:—

CITY OF GLASGOW, 1888.

Total births	- - 19,255.	
Public gratuitous vaccinations:—		
Sanitary Office	- - 1,088	
Royal Infirmary	- - 1,151	
Western Infirmary	- - 128	
Faculty Hall	- - 377	
	——	2,744
City Parochial Board	- 35	
Govan Parochial Board	- 36	
Barony Parochial Board	- 35	
	——	106
		2,850

For that year, therefore, the total of gratuitous vaccinations was 15 per cent., of which only 0·5 per cent. was parochial. The chief share fell to the Royal Infirmary, and the Sanitary Office, but the Faculty of Physicians and Surgeons, and the Western Infirmary performed together five times as many public vaccinations as the body charged with the duty by the State. The number of primary gratuitous vaccinations done at the Sanitary Office subsequent to 1888 * are:—

1889	- -	1,070
1890	- -	796
1891	- -	856
1892	- -	831

Owing to the system whereby the whole city is divided into districts, controlled by the central sanitary authority, this department has the means of tracking those people

* For statistics showing the activity of this department in earlier years I may quote from Dr. Russell's paper on "The Policy and Practice of Glasgow in the Management of Epidemic Disease"; *Trans. Epidemic Soc.*, vol. i. 1883. He says, "In the 10 years 1871–80 we per-"formed 12,718 primary and 9,514 secondary vaccinations."

GLASGOW.

who have failed to return vaccination certificates to the parish registrars. In this respect also the Sanitary Office carries out voluntarily, and in a more efficient manner, a duty that rests primarily with the parochial boards. For the latter confine their action in following up defaulters to a single inquiry made at the address given on the certificate; and as the class most in default are just those whose residence is by no means a permanent one, the list of the "removals and unaccounted for" would be much larger than it is if it were not for the action taken by the Sanitary Office. Every week the office receives returns from the registrars giving the names and addresses of those who are in default with respect to vaccination certificates. Personal inquiry is made by the inspectors at the houses named, with the result that a certain number are found who have neglected vaccination altogether, a certain number who have had their children duly vaccinated, but who have neglected to send in the certificate,* whilst not a few families are found to have removed to other districts. These are often traced to their new homes by means of the system of district inspection; so that the residue who have left the city or who cannot be traced, is much reduced. It is obvious that were it not for the organised system of house-visitation by the inspectors of the Sanitary Department many of those in default could not be traced; but as it is, the vaccination returns are rendered more complete by the practice. The total number of visits made by inspectors to discover vaccination defaulters in the year 1891 was 1,587; "the number discovered and vaccination "enforced," 419; the "number discovered and registration secured," 575. (*See* Mr. Fyffe's 22nd Annual Report on the Operations of Sanitary Department of the City of Glasgow for the year ending 31st December 1891.) In order to obviate the chances of persons failing to return vaccination certificates the Department returns to the registrars the certificates of all those vaccinated under its auspices.

Re-vaccination.—During the year 1891 45 people were re-vaccinated at the Sanitary Office, and 145 at their own homes. It is, however, in epidemic years that the resources of the Department for this purpose are most taxed. Its prompt performance on individuals of infected households is largely ensured by the system obtaining here of having the epidemic inspectors trained for the purpose, a practice introduced by Dr. Russell 20 years ago, as stated in the subjoined memorandum which he has furnished me:—

'Present system of Vaccination in Glasgow.

"I quote from Dr. Gairdner's Report for 1871 (pp. 8 and 9):—

" 'As early as 1863, it was made a general instruction
" 'to the District Medical Officers that in all cases in
" 'which small-pox was reported in a locality vaccination
" 'should be not only freely offered, but systematically
" 'pressed upon the inhabitants of the neighbourhood, as
" 'well as of the immediately infected house; and this
" 'instruction, carried out in quiet times by the District
" 'Medical Staff without special assistance and without
" 'any unnecessary publicity, was expressly promulgated
" 'as a principle of action, and made the basis of special
" 'arrangements during the threatened epidemic of the
" 'past year. . . . At the time when it appeared to be most
" 'needed, new vaccination stations were opened in several
" 'quarters of the city; and these, as well as the older
" 'facilities, were extensively advertised by hand-bills
" 'posted on the walls; advertisements, stating the
" 'ground for apprehension and for action at large, were
" 'inserted in the newspapers, and a staff of vaccinators,
" 'ultimately reduced to one as the epidemic declined,
" 'was appointed to follow up all cases of small-pox
" 'reported, and to carry supplies of lymph, with offers of
" 'prompt and gratuitous assistance, into the homes of
" 'the poor in the infected localities.'

"When I entered on office in November 1872, and in the "spring of 1873 small-pox again became epidemic, I saw "that the system of making a note of persons ready to "accept vaccination, and then going with a doctor next "day was not successful, while if at the first visit the "operation was offered it was accepted largely. I there-"fore had the epidemic officers all trained, and made Dr. "Carmichael responsible for the collection and supply of "lymph and any *primary* vaccinations necessary. I aban-"doned district stations and kept that at office always "going for primary vaccination.

"J. B. RUSSELL.

"Sanitary Department, Glasgow,
"14th January 1893."

No primary vaccinations are done by the epidemic inspectors; and as regards re-vaccinations, the people, if they prefer it, are sent to their medical man to be re-vaccinated, and at the present juncture (see later) practitioners performing re-vaccinations gratuitously are paid a fee by the sanitary authority.

Apart from re-vaccinations done at the Central Office, those performed during an epidemic of small-pox, as at present, may be—

(*a.*) Domestic, *i.e.*, re-vaccination of inmates of an infected house, by the epidemic inspector or medical practitioner, on the removal of the small-pox case.

(*b.*) Re-vaccination of employés at factories and workshops, if a case of small-pox occur among the hands. Re-vaccination is offered, and all who consent to it are re-vaccinated. Sometimes a firm will request the Sanitary Department to re-vaccinate their staff.

(*c.*) Re-vaccination of inmates of model lodging-houses, a matter of greater difficulty owing to the number of occupants and their nomadic habits. During the present outbreak a week's free lodging has been offered to each inmate of an infected lodging-house who consents to be re-vaccinated; and the Police Commissioners have decided to extend this privilege to all the lodging-houses under their own management. It is likely that the same measure will be carried out in other model lodging-houses.

Calf lymph has been used for the re-vaccination when the supply of humanised lymph has run short, or when the person expresses a preference for the former.

§ 3. *Small-pox in Glasgow*, 1870–1892.

From a memorandum, and from tables* giving the number of cases of small-pox treated at the fever hospitals, and also the number of deaths occurring in the city and in hospital, with which Dr. Russell has kindly furnished me, it appears that the last epidemic of importance in Glasgow "extended from 1870 to 1875, having its acmé in the "year 1st May 1873 to 30th April 1874, when 1,475 cases "were treated in hospital, among which 262 deaths "occurred." (*See* Plate II.) A more complete view of the extent to which Glasgow suffered in that epidemic is given in the subjoined table, which applies to all the cases occurring in municipal Glasgow, distinguishing those treated at their own homes and those removed to the hospitals. This table also gives the total numbers of re-vaccinations performed in each of these epidemic years.

TABLE VI.

Glasgow, 1871–4; *Small-pox deaths and cases, with the number of Re-vaccinations performed.*

Deaths.

Year.	Hospital.	Home.	Total.
1871	160	105	265
1872	97	40	137
1873	187	36	223
1874	144	77	221

Cases.

Year.	Hospital.	Home.	Total.	Re-vaccinations.
1871	702	387	1,089	1,836
1872	515	274	789	729
1873	1,024	208	1,232	3,119
1874	967	191	1,158	3,052

Dr. Russell's memorandum goes on to say:—

"In 1877 there was a limited outbreak resulting in "11 deaths in the course of the year. In 1883–4–5 there "was another small spurt at its height in 1884. At the "end of 1892 another outbreak has taken place which is

* These cases are returned as "insusceptible from previous vaccination."

* Appendix VII.—From the table which deals with the numbers admitted into the Glasgow Fever Hospitals, and the deaths among those admitted, I have constructed the accompanying diagram (Pl. II.). It must be borne in mind that, 1st, this does not embrace *all* the cases occurring as a certain proportion were treated at home; 2nd, that some of the hospital cases came from districts outside Glasgow; and, 3rd, that the hospital "year" does not correspond with the natural year.

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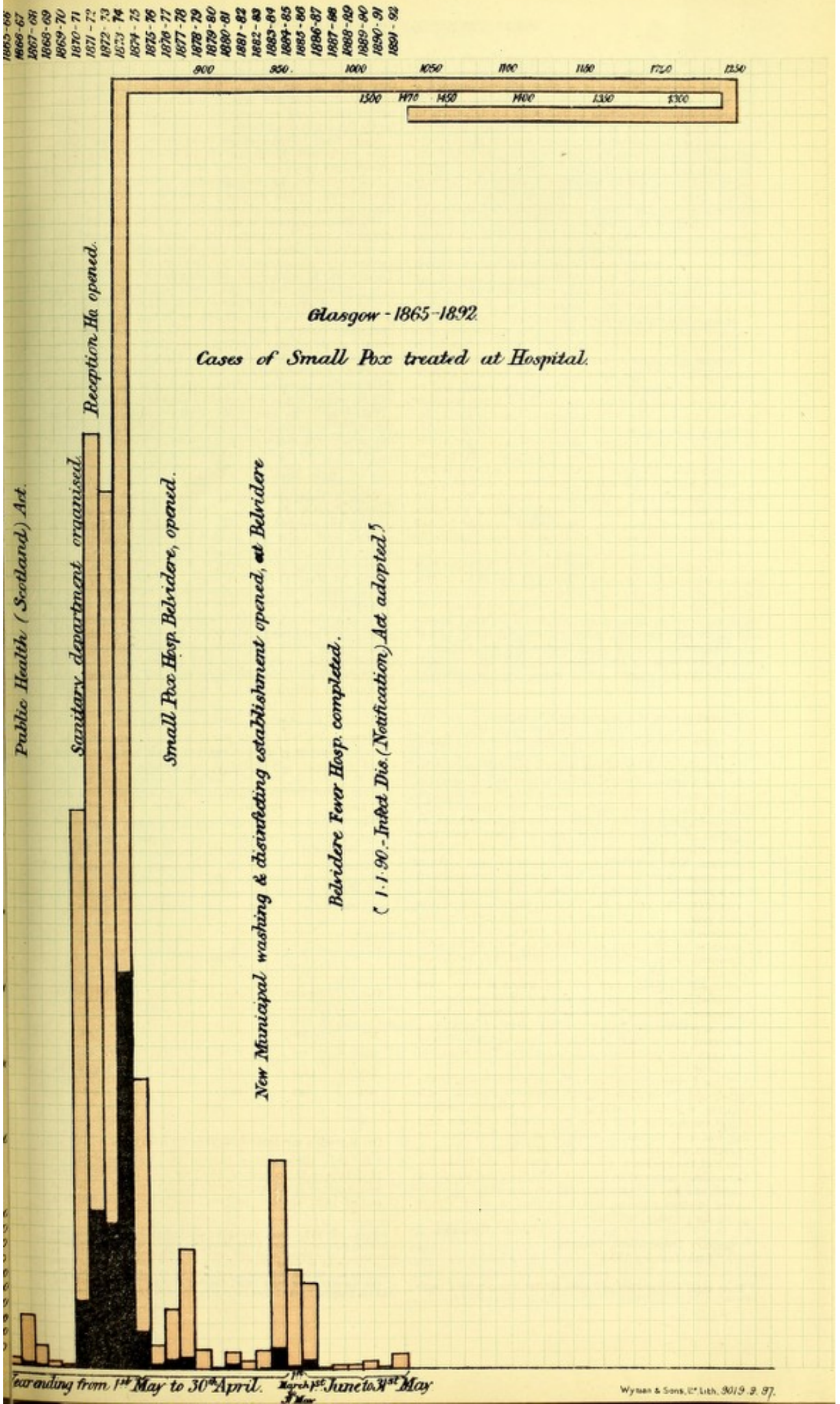
Plate II



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" the immediate occasion of this report, when hitherto has " not assumed any dimensions, but regarding which it " remains to be seen whether it will be got rid of on the " same terms as the two preceding. In the intervals " between these outbreaks the history of small-pox has " been uniformly one of importation of cases from without, " usually treated so as to prevent contamination of the " resident population and broken by long periods of " absolute immunity.* *During 5 years 1887–91 not a " single death was registered in Glasgow from small-pox.*

" It will be interesting to enter with a little detail into " the source of infection in the appearances of small-pox " in Glasgow since 1882. In January 1883 the disease " appeared in the southern suburbs (beyond our jurisdic- " tion) among the workers in a paper mill, in March, " after a continuous absence for 10 months, the first case " appeared inside the city. The disease smouldered on " during the autumn and through the winter of 1884 " attaining its acmé in March, and disappearing in " August. In April 1885 a case was imported from an " outbreak originating in a paper mill near Airdrie. Then " followed from time to time importations of seamen— " twice from London, and on five different occasions from " Montreal—leading up to a small series of indigenous " cases in the autumn and winter, ending with the year. " Three importations from Montreal, Hartlepool, and " South Queensferry occurred in the opening months of " 1886. From May of that year through the whole of " 1887 and up to March 1888, not a single case of small- " pox was seen in Glasgow. In that month a stoker of a " steamship from Santander developed the disease. In " April, an actor who came with his company from Shef- " field developed the disease. Then followed a blank " period ending in January 1889, with the importation of " a sailor by a vessel from Saffi in Morocco. After nearly " a year's interval, in January, 1890, the captain and " three of the crew of a steamship from Leghorn de- " veloped the disease. In June an indigenous case " occurred—a spirit salesman—origin not ascertained. " After a year's interval, in June, 1891, an outbreak in " the Sailors' Home leading to seven cases having a dis- " tinctly foreign source occurred. Among these were " three residents distinctly associated with the Sailors' " Home, but the disease went no further. In October of " the same year an infected passenger from Bilbao was " picked up."

§ 4.—*Small-pox in Glasgow*, 1892–93.

In relating the history of the present outbreak, inquiry into which is the object of this Report, I may be permitted to give in the first place the brief summary of its origin and progress by Dr. Russell in continuation of his Report.

" In March 1892, a Russian Pole *en route* to the United " States was found to have small-pox. On 6th August, " a sailor presented himself at the Sanitary Office obviously " suffering from small-pox. He left Bilbao 21st July, " landed 25th, fell sick on 28th, observed an eruption on " 4th August, consulted a medical man on 6th, and by his " instructions went direct to the Office. From the 25th " July he had lodged in a common lodging-house in the " neighbourhood of the harbour, which is frequented " chiefly by quay labourers. During the period of in- " fectivity prior to removal to hospital this man led the " usual unrestrained life of a sailor ashore. The disease, " confined at first to persons employed about the harbour " or frequenting this lodging-house, gradually extended by " contact of individuals waiting advice in dispensaries, in " public-houses, &c., &c., into other grades of employment. " It has considerably affected the class who frequent " common lodging-houses. At present the incidence is " chiefly among the textile workers of the east end and " cases have occurred among the criminal class. GLASGOW.

" Beginning with the sailor just referred to the following " table indicates the course of the disease:—

Week ending	August	6	-	1 case	registered.
,, ,,	,,	13	-	—	
,, ,,	,,	20	-	—	
,, ,,	,,	27	-	2 cases	registered.
,, ,,	September	3	-	—	
,, ,,	,,	10	-	—	
,, ,,	,,	17	-	2 cases	registered.
,, ,,	,,	24	-	2 ,,	,,
,, ,,	October	1	-	1 case	,,
,, ,,	,,	8	-	1 ,,	,,
,, ,,	,,	15	-	—	
,, ,,	,,	22	-	4 cases	registered.
,, ,,	,,	29	-	5 ,,	,,
,, ,,	November	5	-	13 ,,	,,
,, ,,	,,	12	-	10 ,,	,,
,, ,,	,,	19	-	9 ,,	,,
,, ,,	,,	26	-	8 ,,	,,
,, ,,	December	3	-	3 ,,	,,
,, ,,	,,	10	-	5 ,,	,,
,, ,,	,,	17	-	6 ,,	,,
,, ,,	,,	24	-	3 ,,	,,
,, ,,	,,	31	-	2 ,,	,,
,, ,,	January	7, 1893.		16 ,,	,,
,, ,,	,,	14 ,,		18 ,,	,,

" The sum of the whole to 7th January is, 93 cases and " 7 deaths, of which 5 remained at home and 1 died at " home. During the week ending to-day there have been " 18 cases. In connection with the 93 cases, 1,190 per- " sons were re-vaccinated at their residence, or 13 per " case.

The whole number of cases known to have occurred up to the 14th January 1893 is 112, but of these, one, an infant, died before it was discovered, so that only 111 cases were notified and registered. Again, of this number four were not removed to the hospital, owing in three instances to the fact that their attack had been overlooked; these were all females.

Full details of the remainder, 107 cases, are furnished in the elaborate tables prepared by Dr. Marsh, the resident physician to the Small-pox Hospital. (*See Appendix VIII.*)

Of this number nine died up to February 20th, and there still remained in hospital at that date 10 cases, four males, six females, all doing well. These are included in the list of " Recovered." Analysis of Small-pox cases 1892-3.

TABLE VII.

Glasgow; Small-pox cases in Belvidere Hospital, 1892–3; *Age, Sex, and Mortality.*

Age.	Males.			Females.			Both Sexes.		
	Recovered.	Died.	Total.	Recovered.	Died.	Total.	Recovered.	Died.	Total.
Under 1 year	—	1	1	—	—	0	—	1	1
1 to 5 years	4	—	4	—	—	0	4	—	4
5 to 10 ,,	1	—	1	3	—	3	4	—	4
10 to 15 years	3	—	3	5	—	5	8	—	8
15 to 20 ,,	7	—	7	6	—	6	13	—	13
20 to 30 ,,	20	1	21	13	1	14	33	2	35
30 to 40 ,,	15	2	17	11	2	13	27	3	30
40 to 50 ,,	6	2	8	3	—	3	9	2	11
50 years and over	—	—	0	1	—	1	1	—	1
	56	6	62	42	3	45	99	8	107

So far the character of the epidemic has not been severe, the mortality being 10 out of 112 cases, or 8·9 per cent. the proportion of confluent cases being about one-fifth of the 107 cases admitted into the Belvidere Hospital. The eruption is described by Dr. Marsh as being " confluent " (and semi-confluent) in 21, " copious " in 20, " sparse " in 27, " rare " in 23, whilst in the 16 remaining cases, a few pocks only (except in one where 37 were counted) are in-

* These cases were all found in their lodgings or residences or if living on board ship had been in free communication with shore for days. All cases of active infectious disease are removed from inward-bound vessels at Greenock.

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dicated. One of the "confluent" and one of the "copious" cases were also "hæmorrhagic." Analysing these with respect to age-incidence it is seen that the majority (18 out of 21) of the cases with confluent eruption, and of those (19 out of 20) with a "copious" eruption were in individuals beyond the age of 20 years.

TABLE VIII.

Cases at Belvidere Hospital; Type of Small-pox with reference to age.

Character of Eruption.	Age under 1 year.	1–5 years.	5–10 years.	10–15 years.	15–20 years.	20–30 years.	30–40 years.	40–50 years.	50 years and upwards.
Confluent and semi-confluent	1	—	1	—	—	7	8	3	1
Copious	—	—	—	—	—	8	6	6	—
Sparse	—	1	1	3	6	10	5	1	—
Rare	—	2	1	1	2	7	9	1	—
Few pocks	—	1	1	4	5	3	2	—	—
	1	4	4	8	13	35	30	11	1

Age and type of case.

Again, of the 9 cases of ages 1 to 10 there were—

Cases with confluent and semi-confluent rash	2	2 severe.
,, copious rash	0	
,, sparse ,,	2	7 mild.
,, rare ,,	3	
,, few pocks	2	
	9	

Of the 56 cases of ages 10 to 30 years there were—

Cases with confluent rash	7	15 severe.
,, copious ,,	8	
,, sparse ,,	19	41 mild.
,, rare ,,	10	
,, few pocks	12	
	56	

Of the 42 cases of ages 30 and upwards there were—

Cases with confluent rash	12	24 severe.
,, copious ,,	12	
,, sparse ,,	6	18 mild.
,, rare ,,	10	
,, few pocks	2	
	42	

In spite of their paucity these figures show clearly that the incidence of the milder attacks fell in much larger proportion upon the children than adults of 30 years and upwards.

Vacc data.

It will be seen from the tables that very great care has been taken by Dr. Marsh to procure an accurate record of the condition of vaccination in each case. The analysis which he has also supplied of the cases observed in 1892 also shows how the facts as to vaccination are related to the age of the patient and the result of the illness. (*See Appendix IX.*) I must content myself with a few general remarks on those valuable statistics, which, when the epidemic has passed away, and the record is complete, will form an important contribution to the accumulated data at present existing upon the bearing of the character of vaccination cicatrices and the type of small-pox in the subjects of them. It may be noted that out of the 73 cases admitted into the Belvidere Wards during 1892, 68 were of vaccinated persons—three of whom died; that one patient, who presented no visible cicatrix, but was said to have been vaccinated, died; and that of four others who also had no vaccination cicatrices, one died. It may be added that three "vaccinated" fatal cases all fell under the Class A[4], in which the area of the cicatrix was not recorded; that in two, aged 28 and 45 years respectively, there was in the one case a single "well-defined" cicatrix, and in the other a single "small and ill-defined" cicatrix; whilst in the third, aged 37, there were three "ill-defined" scars. The matter, however, requires to be analysed further with respect to the type of the eruption, and it will be better to await the completion of the record before making any deductions from such facts.

Sma the nat

Owing to the promptitude with which *re-vaccination* of members of an infected household had been carried out, the influence of re-vaccination during the incubation and invasion periods of small-pox has been traceable in a certain number of individuals attacked subsequently to the removal of the first case to hospital. The numbers are again too few to admit of sound inferences, but the following grouping of the facts may be of some utility.

TABLE IX.

Re-vaccination before or during attack of Small-pox.

Age.	Re-vaccinated before appearance of Rash.												After Rash.					Type of Rash.
	18.	14.	13.	12.	11.	10.	9.	8.	6.	3.	2.	1.	0.	1.	2.	3.	5. Days.	
1–5 years	1*	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Mild, 1.
5–10 ,,	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
10–15 ,,	—	1	—	—	—	—	—	1	—	—	—	—	—	—	1	—	—	Mild, 3.
15–20 ,,	—	—	—	—	1	—	—	1	—	—	2	1	—	—	—	—	—	Mild, 5.
20–30 ,,	—	—	—	—	—	—	—	—	—	1	—	—	1	—	—	—	—	Mild, 2.
30–40 ,,	—	—	1	1	—	1	1	—	1	1	—	1	—	1*	—	1	1	Severe, 1. Mild, 9.
Result of re-vaccination, S. = "Successful." U. = "Unsuccessful."	S.	S.	S.	S.	U.	S.	S.	S. S.	S.	U. S.	U. U.	U. U.	U.	U.	U.	U.	U.	

* No evidence of primary vaccination in this case.

In addition there were two patients over 40 years of age who had been re-vaccinated, the one successfully, four years ago, and the other unsuccessfully five months since (Nos 103 and 64). The former had a mild and the latter a severe attack.

It will be seen that 21 of these persons were re-vaccinated, 16 at various periods before the appearance of the small-pox eruption, in one case the re-vaccination and the rash coincided; whilst in four the re-vaccination was performed after it had appeared.* Of the whole number the re-vaccination did not take in 11; in seven, one vesicle was produced; and in one case two vesicles. In

* It may be noted that of the 12 cases re-vaccinated before the onset of symptoms, 10 were successful; whilst in not one of the nine vaccinated at a later period did the vaccination take. This is of interest in the question of concurrent vaccinia and variola.

two cases there was no evidence of previous vaccination; one of these, a child four years of age, had one vesicle produced, and passed through a mild attack of small-pox ("rare" eruption); the other, a female 31 years of age, sent in to hospital as a case of varicella, and vaccinated the day after the appearance of the rash, proved to be a case of confluent small-pox which terminated fatally, there being no result from the re-vaccination. As regards the remainder the attacks were mild in all, the eruption being described as "rare" in nine cases, as "sparse" in one, and as consisting of a few pocks only in nine cases.

I may next consider the course of the epidemic, and especially the connexion traceable between the several cases. The accompanying analysis distinguishes the cases of known origin, in relation to one another, and those occurring independently.

Groups of associated cases.

Group.	Total number of cases.	Date of onset.		Reference to table of Hospital cases in Appendix VIII.	Remarks.
		Of first case.	Of last case.		
I.	13	July 27, 1892.	October 28, 1892.	Nos. 1, to 11, 13, 23.	—
Ia.	14	Sept. (end of).	November 19.	12, 16, 17, 18, 26, 29, 34, 40, 49, 50, 51, 52.	This group commences with a "missed" case, and also includes an infant (No. 50) who died at home, unvaccinated.
II.	12	October 13.	November 1.	14, 15, 19, 20, 22, 24, 27, 28, 30, 31, 32, 33.	—
III.	6	October 3.	December 7.	35, 36, 55, 58, 63, 64.	—
IV.	4	—	—	—	Includes three cases treated at home.
V.	3	November 27.	December 11.	57, 65, 66.	—
VI.	3	November 24.	December 16.	60, 67, 70.	—
VII.	2	December 1.	December 16.	61, 69.	—
VIII.	2	December 17.	January 6.	72, 91.	—
IX.	7	December 31.	—	74, 75, 76, 77, 92, 93, 96.	One more case in this group has been admitted (No. 109 in hospital list).
X.	5	December 18.	January 4.	71, 81, 83, 86, 94.	—
XI.	2	January 3.	January 4.	90, 95.	—
XII.	2	December 13.	—	102, 105.	Another case admitted since table was compiled (108 in hospital list).
	75				

The total number of cases which have thus been traced in connexion with one another amounts to 75,* arising from 12 independent centres. The first group (I.) comprises mostly inmates of lodging-houses, dock labourers, &c., and is supposed to be connected with group Ia, the two combined yielding 27 cases. It may be remarked that the first case of the latter group (Ia) was one which did not come under the cognisance of the authorities, until the subsequent cases arose; and that another of the group (No. 40), was nearly recurred when admitted to hospital on November 12th. As similar example is given in group XII. (No. 102). The next group (II.) is very clearly defined. No. 14, 15, 20, and 22 are members of the same family, No. 19, a neighbour of No. 14, apparently conveyed the disease to her mother (No. 24), sister (No. 27), brother (No. 28), and father (No. 30), whilst No. 33 was known to have visited No. 14 eleven days before he himself sickened. Group III. comprises all the cases which have arisen at Belvidere Hospital, viz., two laundry women at the sanitary laundry (Nos. 35, 36), a nurse (No. 58) who visited the matron 13 days before her attack, a ward cleaner (No. 64), a recent inmate of the fever ward (No. 63), and a youth who may have contracted after his admission as a suspected case (No. 55).

Besides these, the remaining groups require but little comment beyond what will be presently referred to under the head of "missed cases." Doubtless if it were possible to always follow up the history of the patients and to account for all their movements and their intercourse with others the groups of associated cases might be enlarged, leaving a comparatively small number unaccounted for by contagion within the infected area and referable to importation from other centres. It will, I think, be admitted that to trace out the previous history of cases of contagious disease in large communities must be a task of extreme difficulty.

* Increased to 77 since the table in Appendix VIII. was drawn up.

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It is obvious that one main cause of an epidemic increasing in extent in spite of the vigilance of the health officers and the prompt resort to isolation, &c. is in the diffusion of the contagion through the medium of cases which have been so trivial in their severity as not to have come under the notice of medical practitioners. And in a vast community like that of Glasgow, where fresh importations of the disease are almost inevitable, when it is present in other parts of the country, the facilities for its dissemination must be enormous. Several instances of such "missed" cases" come to light when inquiry is made into the antecedents of reported cases; and the house-to-house visitation of the staff of epidemic inspectors in Glasgow has not infrequently been the means of detecting such cases. At the time of my visit steps were being taken to re-vaccinate the mill-hands in a large factory, because of a girl, who with her sisters was working there, having gone back to her work after the holidays with the maculæ of a recent attack of small-pox upon her. The case came incidentally to the notice of the medical officer of health, in conversation with a medical man who mentioned that he had a doubtful case a fortnight before; and inquiry at the house elicited the foregoing facts. Another and even more striking instance is the following:—During the holiday season, a girl taken by her friends for a ride on an engine, was thrown off it in a collision, and sustained a compound fracture of the leg. She was carried to a cottage in the vicinity, and placed in a bed which had just been vacated by a person who was then thought to have been suffering from chicken-pox. Next day she was removed to the infirmary, and her leg was amputated. The amputation did well, but in 12 days from the date of the injury her temperature rose to 103·4, she had backache and headache, and other premonitory symptoms of variola. Dr. Thomson saw her and had her removed to the small-pox hospital, when a scanty papular rash came out the same evening. Inquiry proved that the previous occupant of the bed in the cottage had really suffered from small-pox. It would be easy to multiply instances of this inevitable factor in the spread of epidemic disease; which is especially prominent in small-pox, owing to the mild and markedly modified characters it frequently exhibits.

"Missed" cases.

I may append to this account of the history of the present outbreak the following report* presented by Dr. Russell to the Health Committee at its meeting on January 16th, 1893:—

"The minutes of the Health Committee contained a " report by Dr. Russell as to the prevalence of small-pox " in the city. In reference thereto he says:—'A few notes " 'regarding some of these cases will help to bring home " 'to the minds of the citizens the difficulty of grappling " 'with the disease, and the unknown risks to which its " 'presence in the community exposes all classes:—(1.) " 'On 4th January Mrs. X. and her unvaccinated infant, " 'aged 2 months, were reported in the eastern district. " 'The baby has since died. On the same day Mrs. Y., " 'who keeps a milk and grocery shop in the adjoining " 'tenement, living in the back premises, was also re- " 'ported. Inquiry led to the discovery of the following " 'facts:—On 12th December a factory girl who lodged " 'with Mrs. Y. fell ill, and during the ensuing fortnight " 'was off work. She occupied a bed in a room behind " 'the shop. She was engaged to a brother of Mr. X., and " 'was, in fact, married on 30th December. Mrs. X., " 'with her baby, visited the girl in the middle of the " 'week before Christmas. Following this clue the newly- " 'married woman was visited at her house on 5th Janu- " 'ary, and a most distinct evidence of a recent attack of " 'small-pox being still recognisable, she was transferred " 'to hospital. In the tenements, within the period em- " 'braced in this report, two cases have occurred, but it is " 'impossible to anticipate, and can never be directly " 'traced, how much mischief has been caused by this " 'dispensation of small-pox with milk and groceries, and " 'this marriage of a person suffering from small-pox. " 'Several of the cases in the eastern district are among " 'factory workers. (2.) Five cases belong to the model " 'lodging-house class, whose nomadic habits make them " 'a special source of danger. One man who lives " 'in Partick, and was in frequent intercourse with this " 'class, walked into the sanitary office with a copious " 'eruption on his face, saying that a friend who met him " 'on the street told him he looked as if he had the small- " 'pox, and advised him to call at 1, Montrose Street. A " 'girl in charge of a doctor's shop, into which one of " 'these nomads went, and was found to have small-pox, " 'was the only one of 10 persons in the shop at the time " 'who refused re-vaccination, and is the only one infected. " 'Another man who shifted from one 'model' to another " 'turned up at the office with small-pox, and it was " 'ascertained that on the previous day a charitable clergy- " 'man had taken him into his house and given him his " 'dinner and some underclothing. (3.) A man who " 'sickened in Manchester on the 21st December came on " 'to Glasgow on the 23rd, and next day went to the " 'Saturday Afternoon Concert in the City Hall. He " 'was not able to sit out the entertainment, and was " 'removed to Belvidere on the 26th. He had had the " 'eruption out since the 23rd, and used fully all the " 'public means of locomotion in the interval.'"

Hos accom tion.

When the increasing number of cases of small-pox necessitated the provision of further accommodation at the Belvidere Hospital (*see ante*, p. 8), and two of the original small-pox wards were enclosed by shifting the double barricade from between the first and second pavilions to between the second and third, the further precaution was taken to re-vaccinate the staff, and the inmates of the three remaining pavilions in this block, these being utilised for scarlet fever. That this precaution was justified is seen in the fact that two of the laundry-maids in the sanitary laundry, who declined re-vaccination, were attacked with small-pox (Nos. 35, 36); a nurse in the Small-pox Hospital (No. 58) re-vaccinated five days before the onset of her illness; and a ward cleaner (No. 64) of the hospital, unsuccessfully re-vaccinated five months previously, also contracted the disease. Only one patient in the scarlet fever wards, however, was infected with small-pox; this was a lad nine years of age (No. 63) who was at the time convalescent from scarlet fever,* and, moreover, he was, when attacked by small-pox, undergoing primary vaccination. He had never been vaccinated in infancy, and was vaccinated on December 6th, 1892. The first symptoms of variola appeared on December 8th, the rash on December 10th; the attack was a semi-confluent one.

Imm infe hous to re hous

The use made of the reception houses during this epidemic is evidenced by the fact that from the month of September to the week ending January 14th, 1893, 215 persons of all ages had been removed to them viz., 108 to Weaver Street† and 107 to South York Street.

These admissions per month were:—

	Weaver Street.	South York Street.
1892.		
September	4	—
October	1	9
November	49	67
December	17	22
1893.		
January (to 14th)	37	9
	108	107

or, divided according to sex and age:—

	Weaver Street.	South York Street.	Total.
Males	46	45	91
Females	62	62	124
Age:—			
Under 1 year	5	3	8
1-5 years	18	10	28
5-10 "	14	14	28
10-15 "	14	16	30
15-20 "	12	16	28
20-30 "	15	17	32
30-40 "	5	11	16
40-50 "	8	11	19
50-60 "	12	7	19
60-70 "	1	1	2
70 and over	1	—	1
Age not named	3	1	4
All ages	108	107	215

* From the "Glasgow Herald," January 17th, 1893.

* It is not quite certain how the boy contracted small-pox. One statement is that he climbed the barricade to find his ball which had been thrown over it.

† There were actually 114 accommodated in Weaver Street, by the transfer thither of a family of six persons admitted into South York Street, on December 7th, 1892.

Of this number (215) seventeen developed small-pox after admission, and were removed to the Belvidere Hospital: they belonged to 11 different infected households and were attacked respectively after having been—

10	days	in the	reception	house	- 2 inmates
9	,,	,,	,,	- 4	,,
6	,,	,,	,,	- 1	,,
5	,,	,,	,,	- 1	,,
3	,,	,,	,,	- 1	,,
2	,,	,,	,,	- 4	,,
1	,,	,,	,,	- 4	,,

The majority remained in the Reception House for 15 to 17 days; in a few instances the stay was of shorter duration. But in the case of workers this was not strict quarantine; since these individuals were permitted to go to work, provided they had been re-vaccinated, as soon as their clothes had been returned from the Sanitary Laundry. They, however, always remained for the night at the Reception House during the fortnight; and as directly any inmate complained of illness the temperature was taken, and he (or she) detained in the home, it was thought that no risk was thereby incurred.

Re-vaccinations.— The following table shows the number of re-vaccinations done at residences during each fortnight of the epidemic. The number is very large, amounting on the average to about 13 re-vaccinations to each small-pox case;* a proportion which will doubtless be greatly exceeded if there are many repetitions of an experience similar to that related below.†

TABLE X.

Glasgow, 1892–93; *return of cases of Small-pox registered from the 31st July* 1892.

Period ending	Cases registered.		Revaccinations at Residence during Fortnight.
	Week preceding.	Fortnight preceding.	
1892.			
Aug. 6	1	1	18
13	—		
20	—	—	—
27	2		
Sep. 3	—	2	—
10	—		
17	2	2	29
24	2		
Oct. 1	1	3	18
8	1		
15	—	1	26
22	4		
29	5	9	46
Nov. 5	13		
12	10	23	324
19	9		
26	8	17	278
Dec. 3	3		
10	5	8	92
17	6		
24	3	9	194
31	2		
1893.			
Jan. 7	16	18	183
14	18		

A case of a girl who returned to her work within two or three weeks of falling ill of small-pox has been already mentioned as an example of a "missed" case (p. 14). Her two sisters worked in the same mill as herself, and when her case became known to the authorities, and she was removed to hospital, her sisters were taken into the Reception House. At the same time the manager of the factory, which employed from 1,000 to 1,200 hands, acceded to the suggestion of the medical officer that at any rate those working in the same department as these young women should be advised to be revaccinated. There were about 300 in that department, and 200 of them consented at once to be revaccinated, and finally every one of the mill-hands asked to be done. On the next day, January 13th, epidemic inspectors were sent to the mill and 140 were revaccinated; on the 14th, 90 men, and the rest were to be done on the 16th.

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Reference has already been made to the steps taken in respect to re-vaccination of the inmates of lodging-houses.

Early in the epidemic notices were widely circulated urging the citizens to re-vaccination, and giving the arrangements for free re-vaccination. (*See Appendix X.*) The medical officer sent a circular letter to all the practitioners in the city, stating that the police commissioners were prepared to pay a fee of 1*s.* 6*d.* for each successful vaccination on persons who were themselves unable to pay medical fees. 225 replies according to the proposal contained in his letter were received. Hand-bills were also posted about the city. (*See Appendix XI.*)

Lastly, apart from re-vaccination the *common lodging-houses* have been particularly watched for cases of small-pox. Early in the epidemic a circular letter was issued to the keepers of these houses calling their attention to the importance of early recognition of cases amongst their lodgers. Whenever a case did occur the keepers were enjoined to report to the office any suspicious illness amongst the other inmates. It is, however, hoped that if the scheme for re-vaccinating the inmates of such houses be carried out to the full, no other measures will be required.*

Inmates of infected houses.

The return (*Appendix* XII.) of the number of inmates of houses in which a case of small-pox has arisen, which has been prepared for me by Dr. Chalmers, presents in a striking manner the possibilities of the diffusion of contagious disease. It also shows statistically the steps taken by the Sanitary Department as regards the removal to the Reception House of the members of households, and the re-vaccinations of individuals known to have been in contact with the case. The total amounts to 77 cases, with which 33 others were associated—11 secondary to and 11 simultaneously with the original case, 1 from another source of infection (?), and the remainder, mostly lodging-house folk, either secondary to or simultaneous with the initial case. The number of individuals living in the same house at the time of the illness of the primary case amounts to 2,234 (not including inmates of Belvidere Hospital, Barnhill Poorhouse, and Western Infirmary), an average of 29 persons to each focus of infection; and of this number 205 were removed to the Reception House,† whilst 1,451 persons were re-vaccinated in connexion with these 77 cases, or 18·8 per case. If, however, the cases arising in lodging-houses, and at Belvidere, Barnhill, and the Western Infirmary be excluded, the figures are:—

Sixty-seven initial cases and 24 associated cases; 368 inmates of infected houses, 196 removed to the Reception House; and 1,240 re-vaccinated (or 18·5 per case).

Those taken to the Reception House came from 44 houses, giving an average of between four and five per house.

Conclusions.

To briefly summarise the conclusions which seem to flow from the foregoing facts as regards the adequacy of the measures adopted in Glasgow to combat the extension of small-pox, I may say—

1. That the organisation of the Sanitary Department is excellent. The administrative districts into which the city has been divided, apportion with fair equality the amount of work required of the district inspectors; and the system of a staff of epidemic inspectors is highly to be commended.

* The average in the epidemic years 1871-5 was about 2 per case of small-pox.

† For a fuller return *see* Appendix XII.

* The following excerpt from the proceedings of the Glasgow Town Council on January 19th has reference to this matter:—

"CITY IMPROVEMENT TRUST.

"SMALL-POX IN MODEL LODGING-HOUSES.

"At a meeting of the General Committee on 13th inst., a deputation was received from the Sanitary Department, who asked the co-operation of this committee in an endeavour which was being made to prevent the further spread of small-pox in the city. The deputation explained that there had been a fresh outbreak of the disease within the last fortnight, and that the inmates of the several lodging-houses were specially liable to spread the infection. They therefore asked that this committee should, following what was done on the occasion of an outbreak of small-pox in Portugal Street House a number of years ago, offer a week's lodgings free to the inmates of the several Corporation model lodging-houses who were willing to submit to vaccination; instruct that their employees in the lodging-houses should be re-vaccinated; and discontinue the Saturday evening entertainments in the meantime. After consideration, the committee resolved to agree to the request of the Sanitary Department.

"Bailie Chisholm moved the approval of the minute. He said it would be observed that the committee entered heartily into the wishes of the Health Committee, and had taken steps of a somewhat heroic kind to enable protective measures to be carried out.

"Mr. Burt seconded, and the minute was approved."—("Glasgow Herald," Jan. 20th, 1893.)

† The difference between this number and that given above, viz.: 215, is explicable on the fact that sometimes others than the inmates of the infected house who had come in contact with the patient were removed.

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2. That much depends on the efficiency and zeal of the epidemic inspectors is self-evident; and in witness of their qualities in this respect reference may be made to Appendix IV. It will be there seen that for the seven years, 1885–1891, the proportion of cases of infectious disease "discovered by inspectors" was 41·3 per cent., to 58·770 reported by "medical men and others." That there has been a variation in this proportion since the adoption of the Infectious Diseases (Notification) Act is extremely likely, and in 1891, the first year of its adoption, 75·870 were reported by medical men and others, and 24·270 by inspectors. Since so much depends upon prompt recognition and notification, it is of advantage that the number of cases "discovered" by the inspectors in their daily rounds should diminish.

3. The system which ensures the prompt removal of cases to hospital, and the thorough disinfection of houses, clothing, &c., needs no comment. It is thoroughly adequate and successful.

4. The removal of members of infected households to the Reception House, and their retention there for 14 days in modified quarantine, is undoubtedly an advantage. It might be thought unwise to allow those of them who are workers to follow their pursuits during the day, throughout this period, even although they are not permitted to go to work until their clothing is purified and they themselves re-vaccinated. The risk entailed is theoretically greater than it actually appears. These people undergoing vaccination might be incubating small-pox, and the onset of a mild attack of the latter might be overlooked or attributed to the effects of vaccination. Practically, however, the regulations of the Reception House, and the retention of any inmate who shows signs of ill-health or feverishness, seems to be effective. At any rate no instance of secondary infection from one who was an inmate of the Reception House has come to our knowledge.

5. The remarkable extent to which re-vaccination of persons exposed to contagion has been (or being) carried out, should have its due influence in restricting the epidemic. That re-vaccination of the community at large, those who are not exposed to infection, has not been extensive, is only in accordance with general experience. The prophylactic value of the measure is only appreciated by those in immediate contact with cases of small-pox.

6. If in spite of the vigilance exercised by the authorities, Glasgow suffer so great an invasion of small-pox as to fill the 150 beds* in the hospital at Belvidere, the authorities would no doubt seek temporary premises for cases elsewhere. But it might also then become a question as to whether the occupants of the wards in the Fever Hospital would be exposed to risk of small-pox infection. This is not a fanciful hypothesis, for in spite of the care taken to dissociate the two departments at Belvidere by placing them under separate management with perfectly distinct nursing staffs, kitchens, and other offices, the proximity of the small-pox buildings to those devoted to fever may well become a source of anxiety in view of what is known of the influence of a hospital full of small-pox patients in disseminating the disease.

In conclusion, I beg to thank Drs. J. B. Russell, A. Chalmers, Neil Carmichael, Thomson, and Marsh, for the valuable assistance rendered me in this inquiry, as well as for the trouble and pains they have taken in furnishing me with much of the information contained in this report.

London, January 27th, 1893. S.C.

* About 40 cases per week would suffice.

LIST OF APPENDICES.

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APPENDIX I.

The figures here given as to population differ somewhat from those in "Glasgow Statistics," 1885–1891, by James Nicol, Glasgow, James Maclehose & Son, 1891. In that work the following tables are to be found, pp. 9 and 10:—

SUBURBAN BOROUGHS AND DISTRICTS, INCORPORATED NOVEMBER 1, 1891.

—	Acreage.	Rental, 1890–1891.	Population on 7th April 1891.
		£	
I. Police Burghs of—			
Govanhill	140	57,456	14,339
Crosshill	82	30,388	8,796
Pollokshields (East)	91	54,586	6,681
Pollokshields (West)	372	41,312	3,028
Hillhead	130	89,061	7,738
Maryhill	1,183	75,894	18,313
I. Districts of—			
Polmadie	222	15,368	2,673
Mount Florida	184	54,551	8,161
Langside	398		
Crosmyloof	53		
Shawlands	209	14,385	2,660
Strathbungo	62	21,109	2,954
II.—Districts of—		£	
Bellahouston	334	6,016	144
Kelvinside	765	89,346	5,526
Fossil Park	404	22,546	7,853
Springburn (including Bunhill),	1,068	23,126	7,350
Westham	42	1,000	15
	5,750	596,645	91,252

PARISHES OF GREATER GLASGOW.

—	Acreage.	Rental.	Population.
		£	
City parish (entire)	988	1,303,781	
Barony parish	6,231	1,712,017	*642,227
Govan parish	3,125	937,033	
Cathcart parish	717	84,939	11,959
Eastwood parish	200	14,385	2,660
	11,861	4,052,155	656,846

* Note.—The population has not yet been ascertained in parishes.

APPENDIX II.

CITY OF GLASGOW—CENSUS 1891.

ACREAGE, POPULATION, HOUSES, &c., in the Districts of Greater Glasgow.

Administrative District.	Statistical District.	Acreage.	Total Population.	Houses.		Persons per		Per-centage of Irish Born (whole population).
				Inhabited.	Empty.	Acre (including Institutions & Shipping).	House (excluding Institutions & Shipping).	
Central	Bl.	266	28,543	5,537	276	107	5·136	4·73
	1	215	21,663	4,002	285	101	4·993	6·95
	3	42	9,356	1,867	91	223	4·940	11·14
	6	50	7,487	1,205	104	150	4·676	15·21
	9	115	4,643	936	30	40	4·960	9·76
	10	22	4,418	814	43	201	5·066	16·09
	11	66	22,637	4,989	281	343	4·359	12·40
	12	84	3,458	635	10	41	5·409	12·23
	13	11	3,797	696	22	345	4·958	17·41
	14	35	5,689	1,110	158	163	5·125	23·26
		906	111,691	21,791	1,370	123	5·125	
Eastern	5	1,152	63,348	13,092	517	55	4·752	9·64
	7	857	52,725	11,285	367	62	4·587	9·26
	8	123	26,944	6,235	555	219	4·321	12·29
	Addition Shettleston	40	22	3	—	—	—	—
		2,172	143,039	30,615	1,439	65	4·672	
Northern	2	73	4,678	977	47	64	4·765	14·37
	4	45	15,751	3,279	86	350	4·804	10·44
	15	336	58,609	12,444	567	174	4·682	6·25
	16	61	16,235	3,651	254	266	4·447	18·54
	Sp. M. H.	866	28,278	5,699	218	33	4·962	15·24
	Ward 25.	1,492	16,005	2,919	169	10	5·483	—
		2,873	139,546	28,969	1,341	48	4·817	
Southern	19	389	41,113	8,483	391	106	4·817	6·97
	20	49	9,108	1,856	76	186	4·768	12·87
	21	453	63,493	13,866	474	140	4·579	8·73
	22	48	13,544	2,722	106	282	4·849	16·36
		939	127,258	26,927	1,047	135	4·726	
Western	17	626	30,523	6,002	239	49	4·921	5·88
	18	127	29,670	6,169	173	234	4·742	16·91
		753	60,193	12,171	412	77	4·937	
South Suburban	Ward 17	315	17,014	3,483	129	50	4·879	—
	" 18	334	4,320	851	54	13	5·076	—
	" 19	420	9,337	1,786	215	22	5·227	—
	" 20	243	9,869	1,951	146	40	5·058	—
	" 21	828	3,538	559	32	4	6·311	—
		2,140	44,078	8,630	576	20	5·107	
North-Western	Ward 22	130	7,738	1,585	156	59	4·882	—
	" 23	765	6,190	926	84	8	6·900	—
	" 24	1,183	18,330	3,268	238	15	5·609	—
		2,078	32,258	5,779	478	15	5·581	
Total		11,861	658,073	134,882	6,663	55	4·872	—

[Compiled from Tables I. and XIV. in "Old Glasgow and its Statistical Divisions as at 5th April 1891. Greater Glasgow as constructed by the City of Glasgow Acts, 1891."]

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APPENDIX III.

The epidemic inspector's note-book is a plain book, without printed headings, but usage has secured uniformity in the method of recording facts. These books (of which there is a double supply) are handed in each morning, and the details they contain entered in registers, orders issued, &c. The following is a transcript from one of these books, relating to a recent case of small-pox:—

13 Jan. 1893.

A—— P—— 26.

40 E——n Str. 1 up 2 R.(*a*)

Glasgow.

Wire-worker (Ladywell).

Small-pox.

Mrs. P—— 65 (*b*)

2(*c*). 0(*c*).

3(*d*). 3(*d*). 0(*d*).

Belvidere Hospital.

(*e*) F 2. W 1 ceiling, lobby, 2 closets. Wash all. F. flock.

Felt a shivering on 4th January.

Sickened on 5th January.

Dr. C——, medical missionary, visited on 8th, said diarrhœa and inflammation, and he prescribed. He promised to visit on 10th and did not. Eruption noticed on 9th January.

Dr. McL—— visited on 11th and 12th January, he certified.

Dr. Chalmers visited.

M. McL—— 20 (*f*).

Labourer (Abbots).

(*a*) *i.e.*, inhabiting two rooms, 1st floor.
(*b*) Name and age of mother of patient.
(*c*) *i.e.*, two rooms; not ticketed.
(*d*) *i.e.*, three inmates; three adults; no children.
(*e*) *i.e.*, fumigate two rooms, whitewash one ceiling, lobby, two closets; wash all; fumigate flock.
(*f*) Name, age, and occupation of 3rd inmate.
The rest of entry refers to onset of case, medical attendance, and the visit of Dr. Chalmers, M.O.H., on receipt of notification.

APPENDIX IV.

Year.	Infectious Diseases, Notification, and Inspection.*				
	Reported by Medical Men and others.	Discovered by Officers of Health Department.	Total.	Dealt with thus—	
				Removed to Hospitals.	Treated at Home.	Total.
1885	4,013	4,071	8,084	1,938	6,146	8,084
1886	3,630	3,138	6,768	2,098	4,670	6,768
1887	5,230	3,769	8,999	2,273	6,726	8,999
1888	3,974	4,184	8,158	2,506	5,652	8,158
1889	5,452	5,923	11,375	2,796	8,579	11,375
1890	8,046	3,230	11,276	3,514	7,762	11,276
1891	7,774	2,470	10,244	3,959	6,285	10,244
Total	38,119	26,785	64,904	19,084	45,820	64,904

The foregoing cases were registered as follows:—

——	1885.	1886.	1887.	1888.	1889.	1890.	1891.	Total in Seven Years.
Typhus fever	173	79	113	169	73	99	145	851
Enteric „	610	427	505	449	575	757	780	4,103
Undefined fever	37	34	36	60	30	39	115†	351
Small-pox	46	7	1	2	2	4	8	70
Puerperal fever	39	24	39	53	43	81	84	363
Erysipelas	131	127	131	150	158	850	1,053	2,600
Scarlet fever	2,287	2,848	2,479	2,782	1,570	2,753	3,115	17,834
Measles	3,133	1,479	4,077	3,141	6,939	4,813	3,399	26,981
Whooping cough	1,966	1,263	1,045	738	1,501	1,221	992	7,826
Croup and diphtheria	273	276	381	399	404	576	477	2,786
Diarrhœal diseases	215	165	134	152	37	3	6	712
Chicken-pox	74	39	58	63	43	80	70	427
Total	8,084	6,768	8,999	8,158	11,375	11,276	10,244	64,904

* From "Vital, Social, and Economic Statistics of the City of Glasgow, 1885-1891," by James Nicol, City Chamberlain. Glasgow: James Maclellan and Sons, 1891, p. 168, and Report of Sanitary Inspector 1891.
† Including 73 of influenza.

APPENDIX V.

FORM OF ORDER FOR FUMIGATION AND DISINFECTION.

DISTRICT. No. L/300

Sanitary Department,
Glasgow,_____189

The Disinfecting Branch will please carry out the following, at the house of_____

Fumigate....Apts.....Ceilings.....Lobbies.....Closets.

Whitewash .. do. ..... do. ..... do. ..... do.

Wash.....Clothes..... .....Tick.....

Fume.....Bent .....

Supply Straw.....Beds.....Chaff....Beds....Destroy.....

PETER FYFE.
Sanitary Inspector.

DISTRICT. No. L/300

Sanitary Department,
Glasgow,_____189

The Disinfecting Branch will please carry out the following, at the house of_____

Fumigate....Apts.....Ceilings.....Lobbies.....Closets.

Whitewash.. do. ..... do. ..... do. ..... do.

Wash.....Clothes.....Tick.....

Fume .....Bent.....

Supply Straw.....Beds.....Chaff....Beds....Destroy.....

PETER FYFE.
Sanitary Inspector.

APPENDIX VI.

METHOD OF PUBLIC VACCINATION.

I had the advantage of a long conversation with Dr. Niel Carmichael, the medical vaccinator to the Sanitary Board, and also of observing the method he employs in conducting his public vaccinations. A brief description of this may possibly be of some interest.

The "Vaccination Hall" at Montrose Street is situated on the first floor; and comprises two waiting rooms and a well-lighted consulting room. In one of the waiting rooms (A) the fresh cases (vaccinees) are received; and in the other (B) those who are brought for inspection on the 8th day, some of whom are used as vaccinifers for the fresh cases. As soon as a child has been vaccinated the mother is sent with it into room B. and not into A., where the rest are waiting their turn for vaccination.

A nurse is in attendance whose duty it is to prepare each infant's arm for vaccination, carefully washing it, before Dr. C. arrives.

Dr. Carmichael on arriving passes through room B. and inspects those who were vaccinated in the previous week. From them he selects a certain number as vaccinifers, and they are brought into the vaccinating room and ranged opposite to his chair.

In vaccinating Dr. C. uses a very blunt lancet, which is cleansed between each vaccination by thorough friction with a clean towel. His object in employing this instrument is to avoid drawing any blood whatever. He makes several parallel rows of minute indentation or furrows—through the epidermis, and in no case did I see any blood drawn at all. The lymph is collected in a capillary tube, and rapidly smeared over the abraded surface, the whole operation lasting about half a minute.

To open the vesicle he uses a flattened needle, and here again is careful not to draw blood. If any blood is drawn, he avoids taking it up in the tube which he uses to collect the lymph. Dr. Carmichael now uses some tubes made in Germany and sent over hermetically sealed, and showed me that they are far more efficient than the ordinary stock tubes, probably because the latter invariably take up some dust.

In all cases when the vesicles have been opened, and the tubes charged, and in these cases when the vesicles have been ruptured, a mixture of oxide of zinc and iodoform is freely dusted over the part. Should there be any subsequent trouble of any kind the mother is enjoined to bring the child to the station on the vaccinating days.

In all his experience Dr. Carmichael has rarely or ever seen any post-vaccinal erysipelas. Ulceration and suppuration under a scab with some surrounding inflammation are the chief lesions met with. In such cases the arm is dressed by the nurse, with ung. iodoform, lint, and bandage; a supply of this is presented to the mother, who is requested to bring the child again until the arm has healed. "On the whole, bad arms are rare."

So also are post-vaccinal rashes; and as for syphilis, it has invariably been found, when its manifestation appears in a child who has been vaccinated, that there is undoubted inherited taint present.

I was struck by the uniformity and excellence of the results obtained by Dr. C.'s method of vaccinating. In some of the children the vesicles were very numerous, closely aggregated, and with the merest margin of an areola. He informed me that when he does have an imperfect vaccination, *e.g.*, if only two out of four vesicles have risen, he will "retro-vaccinate" one the same arm or the other side, from one of these vesicles. A curious and instructive point is in respect to this form of "anti-inoculation," that he always finds the secondary vesicle form much quicker than the primary, maturing by the 4th or 5th day instead of the 8th.

If any mother objects to the use of humanised lymph, calf lymph is employed.

Registers are kept of all the cases, and of the source of the stronger lymph.

APPENDIX VII.

GLASGOW, 1865-6—1891-2.

RETURN of Cases of Small-pox treated in the City of Glasgow Fever Hospitals.

Year.	Cases treated.	Deaths.	Remarks.
1865-66	1	--	
1866-67	34	3	
1867-68	14	1	
1868-69	2	--	
1869-70	1	—	
1870-71	369	46	
1871-72	614	105	
1872-73	578	97	
1873-74	1,475	262	
1874-75	191	25	During this period the year extends from 1st May to 30th April.
1875-76	16	2	
1876-77	40	7	
1877-78	80	9	
1878-79	13	—	
1879-80	1	—	
1880-81	11	3	
1881-82	6	—	
1882-83	12	1	
1883-84	139	14	

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APPENDIX VII—*cont.*

Year.	Cases treated.	Deaths.	Remarks.
1884-85	66	3	From 1st May to 31st May 1885.
1885-86	56	7	
1886-87	1	—	
1887-88	2	—	
1888-89	2	—	During this period the year extends from 1st June to 31st May.
1889-90	4	—	
1890-91	1	—	
1891-92	10	—	
	3,745	585	

GLASGOW, 1870–1892.

RETURN of Deaths from Small-pox distinguishing those which occurred in Hospital.

Year.	Total Deaths.	Deaths in Hospital.	
		Number.	Per-centage to Total Deaths.
1870	18	4	—
1871	705	89	65·2
1872	137	92	
1873	223	170	

APPENDIX VII—*cont.*

Year.	Total Deaths.	Deaths in Hospital.	
		Number.	Per-centage to Total Deaths.
1874	221	163	68·2
1875	2	—	
1876	7	6	81·8
1877	11	10	
1878	2	—	
1879	—	—	
1880	2	2	
1881	2	1	84·6
1882	—	—	
1883	6	5	
1884	12	10	
1885	6	6	
1886	2	2	100
1887	—	—	
1888	—	—	
1889	—	—	
1890	—	—	
1891	—	—	
1892	6	5	

APPENDIX VIII.

Return of Cases of Small-Pox admitted into the Small-Pox Hospital, Belvidere, from August 6th to January 14th, 1893.

Number.	Name.	Age.	Sex.	Occupation.	Dates of: Initial Illness.	Dates of: Eruption.	Dates of: Admission.	Dates of: Discharge (well).	Dates of: Death.	Statement as to Primary Vaccination.	Vaccination Cicatrices: Number.	Vaccination Cicatrices: Collective Area in Square Inches.	Vaccination Cicatrices: Fraction Foveated.	Vaccination Cicatrices: Scar depressed or not.	Vaccination Cicatrices: Scar puckered or not.	Vaccination Cicatrices: Glazed or not.	Vaccination Cicatrices: Defined or Undefined in Margin.	Re-vaccination: Date.	Re-vaccination: Number and Description of Cicatrices.	Character of Case. (Eruption).	Remarks.
1	J. G.	32	M.	Fireman on S.S. "General Gordon."	1892, 27 July	1892. 30 July	1892. 6 Aug.	1892. 29 Aug.	1892. —	In Infancy	1	—	—	—	—	—	Well defined	1892. —	—	Sparse	Arrived in Glasgow 27th July. Exposed to small-pox infection at Bilbao, which port he left on 17th July.
2	C. McP.	43	M.	Dock Labourer.	17 Aug.	19 Aug.	22 „	22 Sept.	—	Do.	2	—	—	—	—	—	Do.	—	—	Copious	—
3	J. H.	35	M.	Clerk	20 „	23 „	26 „	22 „	—	Do.	1	—	—	—	—	—	Do.	—	—	Sparse	—
4	A. G.	41	M.	Do.	7 Sept.	11 Sept.	11 Sept.	10 Oct.	—	Do.	2	·62	¼	One depressed.	—	One glazed.	Ill defined	—	—	Copious	—
5	J. C.	32	M.	Night Watchman.	3 „	6 „	13 „	10 „	—	Do.	2	1·84	0	0	One puckered.	Both glazed.	Well defined	—	—	Sparse	Met S at Public Dispensary 12 days before.
6	J. R.	32	M.	Dock Labourer.	14 „	18 „	19 „	15 Nov.	—	Do.	2	·59	¼	—	—	One glazed.	Ill defined	—	—	Confluent	—
7	Mrs. C.	32	F.	Housewife	20 „	22 „	22 „	15 Oct.	—	Do.	1	·28	Whole	—	—	—	Well defined	16 Sept.	One; well defined.	Rare	5's wife.
8	J. K.	45	M.	Dock Labourer.	27 „	29 „	29 „	15 Nov.	—	Do.	2	·93	½	Both depressed.	—	—	Do.	—	—	Copious	—
9	Mrs. B.	31	F.	Housewife	11 Oct.	14 Oct.	15 Oct.	17 Dec.	—	Does not know if ever vaccinated.	0	—	—	—	—	—	—	15 Oct.	Unsuccessful	Confluent	Sent in as Varicella. Revaccinated on order from Sanitary Office.
10	G. B.	29	M.	Carter at quay	10 „	15 „	15 „	2 Nov.	—	In Infancy	2	·69	Whole	Not	—	—	Well defined	15 „	Do.	Rare	9's wife. Also revaccinated as above.
11	A. K.	37	M.	Labourer	10 „	12 „	15 „	15 „	—	Do.	1	—	—	—	—	—	Do.	15 „	Do.	Sparse	9's lodger. Do.
12	J. A.	36	F.	Machinist	9 „	12 „	17 „	12 „	—	Do.	4	1·02	0	Not	—	—	Ill defined	17 „	Do.	Rare	Do.
13	H. D.	45	M.	Dock Labourer.	19 „	21 „	22 „	—	27 Oct.	Do.	1	—	—	—	—	—	Small cicatrix and ill defined.	—	—	Confluent	—
14	J. F.	30	M.	Boilermaker	13 „	15 „	22 „	21 Dec.	—	Do.	2	·73	¼	Not	—	Both glazed.	Ill defined	—	—	Do.	—
15	A. F.	57	M.	Ironworker	27 „	30 „	31 „	23 Nov.	—	Do.	1	·70	¼	Slightly depressed.	—	—	Well defined	—	—	5 pocks	14's brother.
16	S. I.	6	F.	School girl	27 „	28 „	28 „	7 Dec.	—	Do.	3	·50	0	Not	—	—	Ill defined	—	—	Sparse	Lived with 12.
17	A. I.	9	F.	Do.	25 „	27 „	28 „	7 „	—	Do.	4	1·25	0	Do.	—	All glazed.	Well defined	—	—	3 pocks	Do.
18	E. C.	19	F.	Printer	27 „	28 „	28 „	23 Nov.	—	Do.	1	·44	Whole	Do.	—	—	Ill defined	17 Oct.	Unsuccessful	20 „	16's cousin.
19	M. T.	9	F.	School girl	30 „	31 „	2 Nov.	2 Dec.	—	Do.	1	·28	Do.	Slightly depressed.	—	—	Well defined	—	—	Rare	14's neighbour.
20	J. F.	16	F.	Shirt Cutter	30 „	1 Nov.	2 „	23 Nov.	—	Do.	4	1·43	Do.	All depressed.	—	—	Very well defined.	31 „	Unsuccessful	6 pocks	14 and 15's sister.
21	M. R.	13	F.	School girl	29 „	30 Oct.	2 „	28 Dec.	—	Do.	4	1·23	¼	Half depressed.	—	Half glazed.	Fairly well defined.	2 Nov.	Do.	3 „	—
22	Mrs. McF.	34½	F.	Housewife	30 „	2 Nov.	2 „	23 Nov.	—	Do.	2	·76	Whole	Not	—	Glazed	Ill defined	21 Oct.	One; measuring ·47 sq. in., well defined margin.	2 „	14's sister-in-law.
23	J. H.	23	M.	Dock Porter	28 „	31 Oct.	2 „	23 „	—	Do.	1	·33	¼	All depressed.	—	—	Well defined	—	—	37 „	—

GLASGOW

GLASGOW.

Number.	Name.	Age.	Sex.	Occupation.	Dates of Initial Illness.	Dates of Eruption.	Dates of Admission.	Dates of Discharge (well).	Dates of Death.	Statement as to Primary Vaccination.	Vaccination Cicatrices. Number.	Collective Area in Square Inches.	Fraction Foveated.	Scar depressed or not.	Scar puckered or not.	Glazed or not.	Defined or Undefined in Margin.	Re-vaccination. Date.	Re-vaccination. Number and Description of Cicatrices.	Character of Case. (Eruption).	Remarks.
24	Mrs. T.	35	F.	Housewife	1892. 31 Oct.	1892. 3 Nov.	1892. 3 Nov.	1892. —	1892. 6 Nov.	Doubtful if ever vaccinated.	0	—	—	—	—	—	—	1892. —	—	Confluent and hæmorrhagic.	19's mother. Miscarried in the 5th month.
25	E. P.	25	F.	Hair-worker	31 „	1 „	3 „	28 Dec.	—	No information.	0	—	—	—	—	—	—	—	—	Confluent	—.
26	A. B.	43	F.	Housewife	31 „	2 „	4 „	24 „	—	In infancy	1	·30	Whole	Slightly depressed.	—	—	Well defined	—	—	Copious	Met 12 at public dispensary on 17th October.
27	A. T.	11	F.	Schoolgirl	3 Nov.	4 „	4 „	2 „	—	Do.	3	·39	Do.	Not	—	—	Ill defined	—	—	6 pocks	24's children.
28	J. T.	4	M.	Nil	3 „	4 „	4 „	2 „	—	Do.	2	·30	None	—	—	Glazed	Well defined	—	—	3 pocks	24's children.
29	J. H.	37	M.	Manufacturer	31 Oct.	2 „	4 „	—	14 Nov.	Do.	3	—	—	—	—	—	Ill defined	—	—	Confluent	12's employer.
30	M. T.	38	M.	Engineer	1 Nov.	4 „	4 „	2 Dec.	—	Do.	3	·02	None	Depressed points.	—	—	—	22 Oct.	Successful	Rare	19, 27, and 28's father, and 24's husband.
31	D. D.	18	M.	Van driver	2 „	5 „	5 „	21 „	—	Do.	6	1·53	—	—	—	—	—	—	—	Sparse	—.
32	Mrs. B.	35	F.	Housewife	2 „	5 „	5 „	10 „	—	Do.	2	·34	½	Not	Not	Not	Ill defined	2 Nov.	Unsuccessful	Rare	—.
33	W. McC.	28	M.	Iron Turner	1 „	2 „	5 „	10 „	—	Do.	3	·92	More than ½.	Not	—	—	One only, defined in margin.	—	—	Do.	Visited 14 on 21st October.
34	P. G.	4	M.	Nil	1 „	4 „	8 „	17 „	—	Said to have been vaccinated in infancy.	0	—	—	—	—	—	—	18 Oct.	One measuring ·38 sq. in. Glazed and well defined.	Do.	Associated with 12.
35	Mrs. M.	28	F.	Washerwoman	3 „	6 „	8 „	—	15 Nov.	In infancy	1	—	—	—	—	—	Well defined	—	—	Confluent	Employed in sanitary washhouse.
36	Mrs. M.	33	F.	Do.	5 „	8 „	9 „	10 Dec.	—	Do.	2	1·27	More than ½.	Not	—	Glazed	One defined	7 Nov.	Unsuccessful	Rare	Do. do.
37	Mrs. W.	21	F.	Housewife	6 „	10 „	10 „	21 „	—	Do.	1	·86	½	Slightly depressed.	—	Slightly	Well defined	—	—	Do.	—.
38	Wm. D.	2 5/12	M.	Nil	6 „	9 „	11 „	31 „	—	Said to have been vaccinated in infancy.	1	—	—	—	—	—	Slight linear scar.	—	—	Sparse	—.
39	E. A.	25	F.	Nil	8 „	11 „	11 „	21 „	—	In infancy	2	·46	More than ½.	Slightly	—	Slightly	Well defined	—	—	Do.	—.
40	R. B.	11	M.	Schoolboy	About Sept. 15.	—	12 „	28 Nov.	—	Do.	1	·04	None	Do.	—	—	Undefined	—	—	Do.	Admitted after nearly all the crusts had separated. 16 and 17's cousin.
41	R. C.	28	M.	Steel-worker	9 Nov.	11 Nov.	13 „	28 Dec.	—	No information	0	—	—	—	—	—	—	—	—	Confluent	—.
42	A. H.	12	F.	Nil	8 „	10 „	14 „	21 „	—	In infancy	1	·44	½	Depressed	—	Glazed	Well defined	—	—	Sparse	—.
43	Mrs. McA.	37	F.	Housewife	7 „	10 „	14 „	10 „	—	Do.	2	1·06	¾	Depressed	—	—	Do.	—	—	Rare	—.
44	H. G.	21	M.	Wood-carver	9 „	11 „	14 „	—	15 Nov.	Said to have been vaccinated in infancy.	0	—	—	—	—	—	—	—	—	Copious, Hæmorrhagic.	—.
45	E. G.	28	F.	Dressmaker	5 „	8 „	14 „	10 Dec.	—	In infancy	2	·40	½	Not	—	Glazed	Ill defined	—	—	Rare	—.
46	R. P.	19	M.	Clerk	9 „	12 „	15 „	24 „	—	Do.	2	·52	½	Not	—	—	Do.	—	—	Sparse	—.
47	W. W.	23	M.	Painter	14 „	14 „	15 „	21 „	—	Do.	2	1·24	½	Depressed	—	—	Well defined	11 Nov.	One scab = ·62 sq. inch.	6 pocks	37's husband.

Number.	Name.	Age.	Sex.	Occupation.	Dates of: Initial Illness.	Dates of: Eruption.	Dates of: Admission.	Dates of: Discharge (well).	Dates of: Death.	Statement as to Primary Vaccination.	Vaccination Cicatrices: Number.	Vaccination Cicatrices: Collective Area in Square Inches.	Vaccination Cicatrices: Fraction Foveated.	Vaccination Cicatrices: Scar depressed or not.	Vaccination Cicatrices: Scar puckered or not.	Vaccination Cicatrices: Glazed or not.	Vaccination Cicatrices: Defined or Undefined in Margin.	Re-vaccination: Date.	Re-vaccination: Number and Description of Cicatrices.	Character of Case. (Eruption).	Remarks.
48	F.McN.	15	M.	Hammersmith	1892. 14 Nov.	1892. 17 Nov.	1892. 20 Nov.	1892. 24 Dec.	1892. —	In infancy	2	·88	¼	½ depressed	Puckered	—	One well defined; one not defined.	1892. —	—	Rare	Associated with 46.
49	P.McG.	34	M.	Labourer	16 „	19 „	21 „	24 „	—	Do.	2	1·19	¼	Do.	—	Glazed	Ill defined	—	—	Copious	——
50	Mrs. McG.	24	F.	Housewife	30 Oct.	1 „	22 „	7 „	—	Do.	2	·50	¼	Depressed	—	—	Well defined	—	—	Rare	Admitted after crusts separated. Related to 40 whose mother visited her on 21st October.
51	M.McG.	10	F.	Schoolgirl	13 Nov.	15 „	22 „	10 „	—	Do.	1	·63	½	Do.	Puckered	—	Do.	—	—	12 pocks	——
52	P. D.	11	M.	Schoolboy	19 „	20 „	22 „	31 „	—	Do.	1	·19	½	Slightly	—	—	Do.	12 Nov.	One scar = ·12 glazed. All foveate. Well defined.	10 pocks	38's brother.
53	Dr. A. M.	37	M.	Physician	21 „	23 „	24 „	7 „	—	Do.	1	·63	None	Not	—	Glazed	Ill defined	13 Nov.	One scab = ·28 sq. inch.	20 pocks	Associated with a case not admitted.
54	D. K.	23	M.	Butcher	22 „	24 „	27 „	28 „	—	Do.	2	·87	Whole	Depressed	—	—	Well defined	—	—	Sparse	——
55	H. K.	10	M.	Schoolboy	8 Dec.	10 Dec.	27 „	1893. 11 Jan.	—	Do.	1	·84	Do.	—	—	—	Do.	27 Nov.	One small scab = ·04 sq. inch.	Rare	Sent in on suspicion and contracted small-pox immediately before or after admission.
56	D. S.	33	M.	Butcher	25 Nov.	27 Nov.	28 „	1892. 24 Dec.	—	Do.	1	·50	½	Not	—	—	Ill defined	—	—	Sparse	——
57	A.McK.	2½	M.	Nil	27 „	29 „	2 Dec.	Still in	—	Do.	1	·23	None	Not	—	Glazed	Well defined	—	—	Rare	——
58	I. W.	30	F.	Nurse	29 „	3 Dec.	5 „	24 Dec.	—	Do.	3	1·15	½	½ depressed	—	—	Do.	24 Nov.	One scab = ·38.	Do.	Visited matron on 16th Nov. Came on duty 28th Nov. 1892.
59	Mrs.B.	36	F.	Housewife	28 „	30 Nov.	5 „	31 „	—	Do.	1	·56	Less than ½.	Not	—	—	Undefined	—	—	Do.	——
60	A. B.	20	F.	Domestic servant.	29 „	2 Dec.	6 „	31 „	—	Do.	1	·70	None	Not	—	Glazed	Ill defined	—	—	Do.	——
61	J. C.	17	M.	Printer	1 Dec.	2 „	7 „	31 „	—	Do.	1	1·63	¼	Slightly	—	Glazed	Well defined	—	—	Sparse	——
62	J. B.	29	M.	Wood turner	4 „	7 „	8 „	1893. 11 Jan.	—	Do.	2	·30	Whole	Not	—	—	Do.	—	—	Copious	——
63	J. A.	9	M.	Schoolboy	8 „	10 „	11 „	22 „	—	Not vaccinated in infancy.	—	—	—	—	—	—	—	—	—	Semi-confluent.	Vaccinated for the first time on 2nd December 1892. Born and brought up in America. Concurrent small-pox and vaccination.
64	Mrs. McA.	42	F.	Ward cleaner	7 „	11 „	11 „	21 „	—	In infancy	1	·28	Whole	—	—	—	Fairly well defined.	1891, July	Unsuccessfully	Copious	——
65	E. M.	12	F.	Schoolgirl	10 „	12 „	13 „	11 „	—	Do.	1	·63	½	Depressed	Slightly	½ glazed	Well defined	—	—	Sparse	57's neighbour and visitor.
66	J. M.	16	M.	Message boy	11 „	14 „	14 „	11 „	—	Do.	1	·44	Whole	Do.	—	—	Do.	12 Dec.	Unsuccessful	About 20 pocks.	65's brother.
67	T. B.	16	M.	Coalman	12 „	14 „	14 „	11 „	—	Do.	3	·21	Do.	Do.	—	—	Do.	12 Dec.	Do.	2 pocks	66's brother.
68	A. W.	21	M.	Iron-dresser	10 „	14 „	16 „	11 „	—	Do.	2	1·05	Do.	Slightly	—	—	Do.	—	—	Rare	——
69	L. K.	17	F.	Paper-bag maker.	16 „	17 „	17 „	21 „	—	Do.	3	·75	None	Not	—	—	Ill defined	9 Dec.	Two scabs = 1·24.	Do.	Lives in the same house as 61.
70	J. G.	28	M.	Engine fitter	16 „	18 „	19 „	4 Feb.	—	Do.	2	1·01	Whole	Not	—	—	Well defined	—	—	Copious	Visited 60 on 5th December, and either the 1st or 2nd of the same month.

GLASGOW:

Number.	Name.	Age.	Sex.	Occupation.	Dates of Initial Illness.	Dates of Eruption.	Dates of Admission.	Dates of Discharge (well).	Dates of Death.	Statement as to Primary Vaccination.	Vaccination Cicatrices. Number.	Collective Area in Square Inches.	Fraction Foveated.	Scar depressed or not.	Scar puckered or not.	Glazed or not.	Defined or Undefined in Margin.	Re-vaccination. Date.	Re-vaccination. Number and Description of Cicatrices.	Character of Case. (Eruption).	Remarks.
71	A. R.	22	M.	Labourer	1892. 18 Dec.	1892. 19 Dec.	1892. 21 Dec.	1893. 21 Jan.	—	In infancy	2	·38	½	Not	—	—	Well defined	—	—	Copious	71 and 72 came from Edinburgh where they were exposed to small-pox infection.
72	J. C.	24	M.	Do.	17 „	21 „	24 „	21 „	—	Do.	2	1	More than ½.	Depressed	Puckered	—	Do.	—	—	Sparse	
73	J. L.	29	M.	Telephonist	21 „	24 „	26 „	21 „	—	Do.	1	1·60	Whole	Not	Slightly	—	Do.	—	—	Do.	Came from Manchester on 23rd December. Must have been exposed to small-pox infection in Manchester.
74	Mrs. A.	22	F.	Housewife	31 „	1893. 3 Jan.	1893. 4 Jan.	28 „	—	Do.	1	·78	½	Depressed	½	½	Do.	—	—	Sparse	Sister-in-law to and associated with 77.
75	J. A.	2 m.	M.	Nil	31 „	1 „	4 „	—	1893. 16 Jan.	Unvaccinated	—	—	—	—	—	—	—	—	—	Confluent	74's child. Visited and nursed by 77.
76	Mrs. R.	30	F.	Housewife	29 „	1 „	4 „	Still in. Doing well.	—	In infancy	—	—	—	—	—	—	—	—	—	Semi-confluent.	Associated with 77. Says she has two vaccination scars, but nothing can be seen at the present stage of her illness.
77	Mrs. C. A.	22	F.	Do.	6 „	1892. 8 Dec.	5 „	21 Jan.	—	Do.		·94	¾	Do.	—	—	Well defined	—	—	Sparse	76's lodger. Admitted after nearly all the crusts had separated.
78	J. S.	20	M.	Labourer	1893. 1 Jan.	1893. 3 Jan.	5 „	28 „	—	Do.	1	·44	½	Slightly	—	—	Do.	—	—	Copious	—
79	J. A.	16	M.	Publican's assistant.	3 „	3 „	5 „	25 „	—	Do.		·09	½	—	—	Glazed	Ill defined	—	—	Sparse	—
80	R. W.	35	M.	Painter	1892. 31 Dec.	4 „	5 „	28 „	—	Do.		·38	¼	¼ depressed	—	—	Partly defined	—	—	Rare	—
81	L. P.	16	F.	Doctor's shop girl.	1893. 1 Jan.	6 „	6 „	28 „	—	Do.	3	1·74	More than ½.	Depressed	Puckered	—	Well defined	—	—	Sparse	Associated with 71, who visited the shop on December 21, 1892. There were nine other patients besides 71 in the shop waiting to see the doctor. These were re-vaccinated and none of them took small-pox. Patient was not re-vaccinated by an oversight.
82	J. McL.	40	M.	Ship stoker	31 Dec.	2 „	6 „	28 „	—	Do.	2	·88	0	—	Slightly	Do.	Do.	—	—	Do.	—
83	R. D.	20	M.	Labourer	31 „	3 „	6 „	31 „	—	Do.	1	·62	½	Slightly	—	Slightly	Partly defined	—	—	Do.	—
84	P. McC.	40	M.	Do.	1893. 1 Jan.	4 „	6 „	Still in. Doing well.	—	In infancy on three occasions, but no scars exist bearing out the statement.	—	—	—	—	—	—	—	—	—	Semi-confluent.	—
85	W. A.	36	M.	Mason	1 „	4 „	6 „	Do.	—	In infancy	1	·5	¾	Do.	—	—	Partly defined	—	—	Copious	—
86	D. A.	20	M.	Blacksmith	3 „	6 „	7 „	Do.	—	Do.	1	·78	½	Do.	—	Glazed	Do.	—	—	Do.	—
87	T. B.	42	M.	Joiner	4 „	7 „	7 „	—	15 Jan.	Do.	1	·83	½	Do.	—	—	Well defined	—	—	Confluent	—
88	T. H.	38	M.	Grocer	3 „	6 „	7 „	Still in. Doing well.	—	Says he was twice vaccinated in infancy, but no scars are to be seen.	—	—	—	—	—	—	—	—	—	Do.	—

Number.	Name.	Age.	Sex.	Occupation.	Initial Illness.	Eruption.	Admission.	Discharge (well).	Death.	Primary Vaccination.	Number.	Collective Area in Square Inches.	Fraction Foveated.	Scar depressed or not.	Scar puckered or not.	Glazed or not.	Defined or Undefined in Margin.	Date.	Number and Description of Cicatrices.	Case. (Eruption).	Remarks.
89	C. McA.	25	M.	Painter -	1893. 6 Jan.	1893. 7 Jan.	1893. 7 Jan.	1893. 18 Feb.	1893. —	In infancy -	1	·78	Whole -	Slightly -	—	—	Well defined -	—	—	Copious.	—
90	R. S.	30	M.	Potter -	4 „	7 „	7 „	18 „	—	Do. -	1	·07	0	—	—	—	Ill defined -	—	—	Do.	—
91	M. S.	17	F.	Domestic servant.	6 „	9 „	7 „	Still in. Doing well.	—	Do. -	6	1·41	Whole -	—	—	—	Do. -	—	—	6 pocks -	Associated with 72. Patient met with an accident on December 26th, 1892, and was placed for half-an-hour in the bed occupied by 72 at Tarbet, on December 24th.
92	E. W.	30	F.	Shop assistant	1 „ 1892.	5 „	7 „	28 Jan.	—	Do. -	2	·42	½	—	—	—	Do. -	—	—	Copious -	Associated with 77.
93	Mrs. B.	24	F.	Housewife -	31 Dec. 1892.	3 „	7 „	23 „	—	Do. -	1	·7	0	Depressed	½ puckered	½ glazed	Well defined -	—	—	Sparse.	—
94	W. McC.	22	M.	Grocer -	4 Jan. 1893.	6 „	8 „	28 „	—	Do. -	2	·71	Whole -	Do. -	—	—	Do. -	—	—	Do.	—
95	H. R.	30	M.	Sawyer -	3 „	6 „	9 „	2 Feb.	—	Do. -	1	·28	½	Slightly -	—	Glazed -	Partly defined	—	—	Copious.	—
96	Mrs. I.	33	F.	Housewife	3 „	7 „	9 „	Still in. Doing well.	—	In infancy, but no scar can be seen in the present stage of illness.	—	—	—	—	—	—	—	—	—	Do. -	Met 77, and spoke to her for 10 minutes on 22nd December 1892.
97	Mrs. S.	40	F.	Housewife -	3 „	6 „	9 „	—	16 Jan.	Said to have been vaccinated in infancy in two places. No scars visible.	—	—	—	—	—	—	—	—	—	Confluent.	—
98	E. M'G.	23	F.	Do. -	2 „	4 „	9 „	Still in ward. Doing well.	—	In infancy. No scar to be seen at present.	—	—	—	—	—	—	—	—	—	Copious.	—
99	Mrs. H.	42	F.	Do. -	6 „	9 „	10 „	1 Feb.	—	In infancy -	2	·22	½	—	—	—	Ill defined -	—	—	Do.	—
100	E. L.	21	F.	Weaver -	6 „	—	—	4 „	—	Do. -	2	·94	½	Depressed	½ puckered	½ glazed	Well defined	—	—	Sparse.	—
101	M. A. D.	27	F.	Mill-worker -	7 „	—	—	—	—	No information. No scar to be seen at present.	—	—	—	—	—	—	—	—	—	Confluent.	—
102	J. M'C.	19	F.	Do. -	1892. 13 Dec. 1892.	1892. 16 Dec. 1893.	11 „	21 Jan.	—	In infancy -	1	·44	0	Slightly	—	Glazed	Partly defined	—	—	Sparse -	Admitted after nearly all the crusts had separated.
103	W. F.	40	M.	Bricklayer -	4 Jan.	7 Jan.	—	28 „	—	Do. -	1	·07	½	—	—	—	Undefined	14 years ago.	1 scar = 23 square inch. ½ foveated. Ill defined margin.	Rare.	—
104	F. M'C.	24	M.	Spirit salesman.	7 „	11 „	12 „	Still in. Doing well.	—	No information up to the present.	0	—	—	—	—	—	—	—	—	Confluent.	—
105	A. P.	26	F.	Wire worker	8 „	—	13 „	Do.	—	In infancy -	2(?)	—	—	—	—	—	—	—	—	Semi-confluent.	It is impossible to measure the scars at present.
106	J. C.	38	M.	Warehouseman.	8 „	10 „	—	—	9 Feb.	Not vaccinated in infancy. Inoculated with lymph by a farm servant when 13 years of age, but did not take.	0	—	—	—	—	—	—	—	—	Do.	—
107	M. M'D.	29	M.	Brick-maker -	11 „	14 „	14 „	15 Feb.	—	In infancy -	1	·44	More than ½.	Depressed	—	—	Well defined	—	—	Do.	—

Small-pox Statistics.—Showing the Condition as regards Vaccination of the Patients admitted to the Small-pox Hospital during 1892.

Cases with Primary Vaccination Cicatrix or Cicatrices present.

Area of Cicatrix or Cicatrices.

Class A¹ = ½ and upwards of ¼ square inch total Area. Class A² = ¼, but less than ½ square inch total Area. Class A³ = less than ¼ square inch total Area. Class A⁴. Areas not recorded.

Number of Scars: Three or more; Two; One.

Fovation of Scars: Half and more than half fovented; Less than half fovented; Plain Scars.

Age	A¹ Three or more: Half and more than half fovented	A¹ Three or more: Less than half fovented	A¹ Three or more: Plain Scars	A¹ Two: Half and more than half fovented	A¹ Two: Less than half fovented	A¹ Two: Plain Scars	A¹ One: Half and more than half fovented	A¹ One: Less than half fovented	A¹ One: Plain Scars	A² Three or more: Half and more than half fovented	A² Three or more: Less than half fovented	A² Three or more: Plain Scars	A² Two: Half and more than half fovented	A² Two: Less than half fovented	A² Two: Plain Scars	A² One: Half and more than half fovented	A² One: Less than half fovented	A² One: Plain Scars	A³ Three or more: Half and more than half fovented	A³ Three or more: Less than half fovented	A³ Three or more: Plain Scars	A³ Two: Half and more than half fovented	A³ Two: Less than half fovented	A³ Two: Plain Scars	A³ One: Half and more than half fovented	A³ One: Less than half fovented	A³ One: Plain Scars	A⁴ Three or more: Half and more than half fovented	A⁴ Three or more: Less than half fovented	A⁴ Three or more: Plain Scars	A⁴ Two: Half and more than half fovented	A⁴ Two: Less than half fovented	A⁴ Two: Plain Scars	A⁴ One: Half and more than half fovented	A⁴ One: Less than half fovented	A⁴ One: Plain Scars	Total Vaccination Cases admitted	Deaths amongst Vaccinated Cases: Class A¹	Class A²	Class A³	Class A⁴	Total Deaths amongst Vaccinated cases	Cases in which there was "No Evidence" as to Cicatrices. *See Note.** Total Admissions	Cases in which there was "No Evidence" as to Cicatrices. *See Note.** Total Deaths	Cases in which Vaccination Cicatrix was "Absent." Total Admissions	Cases in which Vaccination Cicatrix was "Absent." Total Deaths
Under 1 year	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
From 1 to 2 years	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
„ 2 „ 3 „	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
„ 3 „ 4 „	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
„ 4 „ 5 „	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
„ 5 „ 6 „	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
„ 6 „ 7 „	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
„ 7 „ 8 „	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
„ 8 „ 9 „	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
„ 9 „ 10 „	—	—	—	—	—	—	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
„ 10 „ 11 „	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
„ 11 „ 12 „	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
„ 12 „ 13 „	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
„ 13 „ 14 „	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
„ 14 „ 15 „	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
„ 15 „ 20 „	3	—	1	1	—	—	—	1	1	—	—	—	—	—	—	2	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
„ 20 „ 25 „	—	—	—	4	1	—	1	—	—	—	—	—	2	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	—
„ 25 „ 30 „	1	—	—	3	—	—	2	—	—	—	—	—	1	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	—	—
„ 30 „ 40 „	—	—	1	4	1	1	—	1	1	—	—	—	1	—	—	—	—	—	—	1	—	—	1	—	—	1	—	—	—	3	—	—	17	—	—	—	1	1	—	—	2	1	—	—
„ 40 „ 50 „	—	—	—	1	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	2	—	—	—	—	—	—	—	—	—	1	—	1	6	—	—	—	1	1	—	—	—	—	—	—
„ 50 and upwards	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	5	—	4	14	2	1	6	2	2	1	—	—	4	1	—	4	1	1	1	—	1	1	—	1	5	—	4	—	—	1	1	—	—	4	—	1	68	—	—	—	2	2	1	1	4	1

* Note.—This column is intended for cases stated to have been vaccinated, but bearing no reliable evidence of the operation.

APPENDIX X.(a).

Copy of Letter addressed to Medical Practitioners.

SMALL-POX.—RE-VACCINATION.

Sanitary Department,
1, Montrose Street, Glasgow,
17th November, 1892.

DEAR SIR,

I REGRET to state that cases of small-pox have now occurred in all parts of the city. From the peculiarly infectious nature of the disease, and the extremely modified and almost unrecognisable form which it may assume in vaccinated persons, all classes in the community are more or less exposed to infection.

In the exercise of the power conferred upon them by the 57th section of the Public Health (Scotland) Act, the Glasgow Police Commissioners, as Local Authority, desire to afford to every inhabitant who may be desirous of being re-vaccinated, but who cannot afford to pay for the operation, facilities for having it done. To this end, they instruct me to inform you that they are prepared to pay to practitioners who re-vaccinate such persons a fee of 1*s.* 6*d.* for each successful vaccination. The Commissioners believe that, if by any means they could obtain the re-vaccination of every individual in Glasgow above 10 years of age, and the primary vaccination of all who had never been vaccinated, any epidemic prevalence of small-pox would be impossible within their jurisdiction.

I am instructed to say that the conditions of payment of this fee are these:— GLASGOW.

1. It is not in addition to, but in place of, any private fee.
2. The name, age, address in full, and result in each case, must be returned to me every Saturday on forms to be supplied, the postage of which will be repaid.
3. The sums due will be made up from these lists, and paid at the same time and in the same way as fees under the Infectious Diseases (Notification) Act, viz., in June and December.

Means will be taken to advise the public generally of this arrangement, and the Commissioners rely upon your active co-operation in urging all persons over whom you have influence to avail themselves of this opportunity of putting themselves beyond the reach of small-pox.

The attention of the parochial boards will also be directed to the Circular Letter of the Board of Supervision, dated 18th February, 1888, reminding those bodies of their responsibility for the vaccination of paupers, or the children of paupers, and defaulters under the Vaccination Act.

I am,
Yours truly,
JAS. B. RUSSELL, M.D.,
Medical Officer of Health.

N.B.—It will be very necessary, in order to maintain a supply adequate to the necessities of re-vaccination, that practitioners should lose no opportunity of collecting and preserving eligible lymph from primary cases.

APPENDIX X.(c.)

Copy of Schedule to be filled up by Vaccinating Practitioner.

GLASGOW POLICE COMMISSIONERS.

PUBLIC HEALTH (SCOTLAND) ACT, 1867.

Return to the Medical Officer of Health of Glasgow of Persons Vaccinated in terms of his Circular-Letter, dated 17th November 1892, for the week ending _____ 189 .

—	Date.	Name.	Age.	Address.	Previously		Result.
					Vac^{d}.	Unv^{d}.	
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							

(*Date*) _____ 189 . (*Signature*) _____

(*Address*) _____

N.B.—This Form not to be used for more than 10 Entries. Use additional Form or Forms if needful.

GLASGOW.

APPENDIX X.(*b*).

*Copy of Reply Card.**

If you agree to this proposal, you will oblige by signing and posting this card.

I am prepared to re-vaccinate in terms of circular letter dated 17th November.

(Signed) _____

____Nov., 1892.

(Address) _____

* 225 of these were returned signed.

APPENDIX XI.

Copy of Placard issued by the Police Commissioners.

PUBLIC HEALTH (SCOTLAND) ACT, 1867.

SMALL-POX. VACCINATION.

The Glasgow Police Commissioners desire to inform the public that CASES OF SMALL-POX have appeared in every district of the city.

The Commissioners believe that if they could secure that no person in the city remained unvaccinated, and that every person above 10 years of age had been re-vaccinated, an epidemic of small-pox within their jurisdiction would be impossible. They, therefore, urge all citizens to see to the protection of themselves and their dependents in this way.

The Commissioners desire the attention of such as are UNABLE TO PAY FOR VACCINATION to the following arrangements:—

FREE VACCINATION OF INFANTS may be obtained on the following days and hours at the following places. Parents are advised not to wait until the expiry of the six months allowed.

Monday.—Royal Infirmary Dispensary, 86, Castle Street - -	12 noon.
Western Infirmary Dispensary	12 noon.
Faculty Hall, 242, St. Vincent Street - - -	2 p.m.
Tuesday.—Sanitary Chambers, 1, Montrose Street - - -	1 p.m.
Thursday.—Royal Infirmary Dispensary, 86, Castle Street - -	12 noon.
Western Infirmary Dispensary	12 noon.
Friday.—Sanitary Chambers, 1, Montrose Street - - -	1 p.m.

FREE VACCINATION may be obtained by attending at these places on the days and hours specified above. Medical practitioners have been authorised to re-vaccinate on behalf of the Commissioners *persons unable to pay a private fee.*

J. LANG,
Clerk to said Commissioners.

City Chambers, Glasgow,
19th November, 1892.

APPENDIX XII.

GLASGOW.—RETURN of CASES of SMALL-POX registered from 31st July 1892 to 14th January 1893, giving the number of Inmates in each house; the number removed to Reception House; the number sickening either at same time or subsequently; and the number of re-vaccinations to each infected house.

Ref. to Table, Appendix VIII.	Name.	Inmates of Infected House.			Re-vaccination.	Remarks relative to Associated Cases.
		Total Number.	Removed to Reception House.	Associated cases in same House.		
1	James G. - -	(*a*)490	—	5	18	Extending from August to October 22nd.
5	John C. - -	6	4	1	29	Secondary.—Wife of John C.
6	John R. - -	(*a*)30	—	—	18	
10	George B.- -	4	1	2	16	Disease contracted at same time.
14	James F. - -	3	2	—	15	
12	Jane A. - -	7	6	3	43	Secondary cases.
15	Alexander F. -	3	2	1	19	Simultaneously.
19	Maggie T.- -	6	5	4	10	Simultaneously.
23	John G. - -	7	6	—	15	
22	Maggie McF. -	7	6	—	11	
32	Jane B. - -	4	3	—	5	
31	Daniel D. - -	5	4	—	2	
33	Wm. McC. -	4	3	--	73	
39	Elizabeth A. -	6	—	1(?)	6	This is a very doubtful case; only one spot; constitutional symptoms not clear.
35	Alice M. -	4	3	—	17	
36	Susan M. - -	5	4	—	32	
37	Mrs. W. - -	6	5	1	40	Husband, simultaneously.
21	Mary R. - -	9	8	—	31	
26	Ann B. - -	9	8	—	21	
—	Mrs. D. - -	7	—	1	10	Secondary.
40	Robert B. - -	8	7	1	56	Simultaneously.
38	William D. -					
29	John H. - -	3	—	—	2	
45	Emily G. - -	4	3	—	27	
34	Peter G. - -	—	2	—	1	
53	Dr. Andrew M.-	5	—	1	—	Wife, simultaneously.
51	Mrs. McG. -	6	5	3	4	Secondary.
44	Hugh G. - -	5	4	—	6	
48	Foster McN. -	7	—	—	33	
43	Mrs. McA. -	5	4	—	6	
46	Robert P. - -	6	—	—	32	
41	Robert C. -	7	6	—	23	
42	Annie H. - -	9	8	—	24	
50	Agnes B. - -	7	6	1	17	Secondary.

(*a*) A lodging-house.

Ref. to Table Appendix VIII.	Name.	Inmates of Infected House.			Re-vaccination.	Remarks relative to Associated Cases.
		Total Number.	Removed to Reception House.	Associated Cases in same House.		
54	Donald K.	5	3	1	22	Subsequent infection.
61	James C.	8	7	1	12	Secondary.
56	David S.	9	—	—	8	
62	James B.	4	3	—	18	
59	Mrs. B.	5	—	—	11	
58	Isa W.	(a)—	—	—	87	
57	Alexander M.	6	5	—	22	
70	James G.	4	3	—	9	
71	Alfred R.	(b)427	9	4	30	
64	Mary McA.	(a)—	—	—	24	
68	Alexander W.	4	—	—	22	
72	John C.	(b)399	—	—	16	
75	James A.	5	—	—	30	
73	John L.	3	—	—	12	
74	Mrs. A.	3	—	1	10	Simultaneously.
77	Mrs. A.	2	1	1	10	Secondary.
82	John McL.	5	—	—	35	
87	Thomas B.	7	6	—	35	
88	Thomas H.	5	—	—	12	
92	Ellen W.	5	—	—	56	
93	Mrs. B.	2	—	—	8	
86	A. D.	(b)350	—	—	14	
78	John S.	4	3	—	8	
80	Robert W.	(b)179	—	—	7	
81	Nettie P.	4	1	—	10	
90	R. Stewart	(c)—	—	—	—	
91	Mary S.	(d)—	—	—	A large number vaccinated by infirmary staff.	
97	Janet T.	8	—	—	Household vaccinated by private medical attendant.	
95	Hugh B.	7	6	—	19	
96	Mrs. I.	5	—	—	26	
100	Elizabeth T.	7	—	—	10	
99	Mrs. H.	13	12	—	20	
102	Jeannie McC.	6	2	—	30	
103	Wm. F	2	1	—		
105	Agnes P.	3	2	—	20	
98	Helen McG.	6	5	—	6	
94	Wm. McC.	5	—	—	9	
101	Mary Ann D.	7	6	—	2	
—	Mary W.	9	8	—	26	
104	Frank McC.	4	—	—	5	
106	James C.	7	—	—	24	
—	Mary R.	6	—	—	39	
107	M. McB.	9	7	—	28	
		2,234	205	33	1,451	

(a) Belvidere Hospital.
(b) A lodging-house.
(c) Barnhill Poorhouse.
(d) Western Infirmary.

II.—Report on the Prevalence of Small-Pox at Liverpool, 1892-93.

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§ 1. *Liverpool: Area, Population; Zymotic Disease.*

Area and population.

Liverpool enjoys the unenviable position of being the most densely populated city in the kingdom. Thus, with an area of 5,210 acres, it had at the Census of 1891 a population of 517,951, or 99·3 persons per acre, which is increased to 115 when the acreage (733 acres) of the docks and quays is deducted. Nevertheless, the population is decreasing, since without having been enlarged by the annexation of suburban townships there is an increasing tendency of the traders to live outside the city boundaries. In this respect the city of Liverpool may be compared with the city of London, and doubtless this migration will continue. The annual increase of births over deaths has for the past 10 years averaged about 5,000. In 1891 the birth-rate was 34·5 per 1,000, the average of the previous 10 years being 35·7.

Death-rate, 1892.

The accompanying diagram (from the Annual Report of the Medical Officer of Health for 1891) gives the fluctuations in the death-rate for a period of 30 years, and also shows the influence exerted upon it by zymotic disease (Pl. III.). I am also indebted to Dr. Stopford Taylor for the following memorandum of the death-rate for the past year:—

Liverpool: Death-rate, 1892.

	Deaths.	Per 1,000.	1891.	Per 1,000.
First quarter	3,940	30·7	3,535	27·3
Second quarter	3,039	23·7	4,101	31·7
Third quarter	2,853	22·2	2,892	22·4
Fourth quarter	2,839	24·7	3,383	26·2
Total	12,671	24·7	13,911	26·9

The total deaths were 1,240 fewer than in 1891, and the rate per 1,000 was 2·2 less than that of 1891. The total deaths were 1,266 below the average of the last 10 years (1882 to 1891) and 1·5 per 1,000 below the average rate for the same period.

The number of deaths registered last year is the lowest, with the exception of 1888, of any year during the past 30 years, and the rate the lowest, with the exception of 1888, when it was 23·1.

The deaths from typhus last year were 18, the lowest number registered in any year.

The deaths from zymotic diseases (1,824) were also the fewest registered in any year with the exception of 1888, when there were 1,796; but the zymotic deaths (289) during the last quarter of the year were the fewest ever registered in any corresponding quarter.*

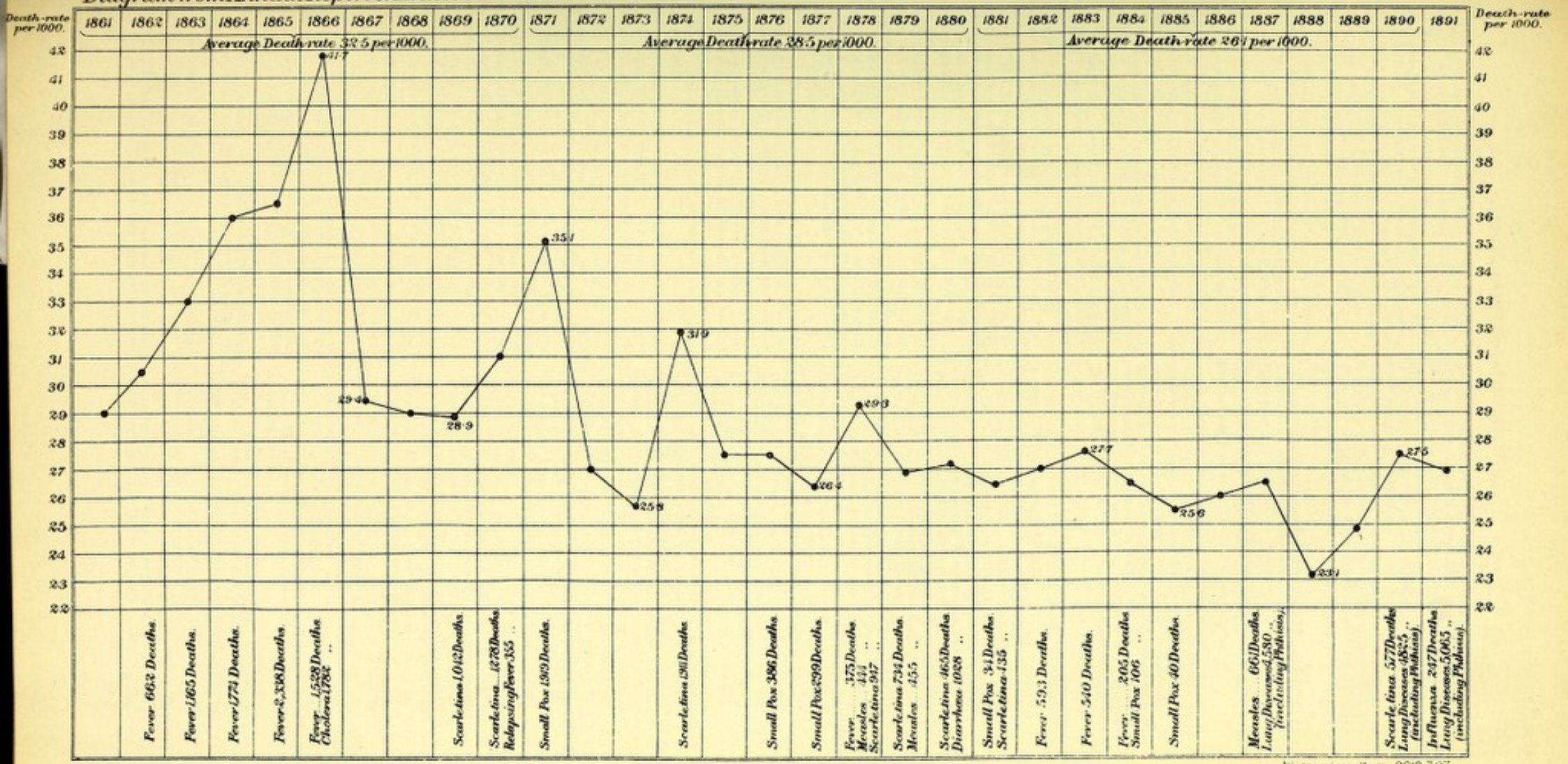
Liab... outbr... of Zy...

The liability of a city like Liverpool to suffer from outbreaks of infectious diseases imported from other lands is self-evident, and every precaution is taken to detect and isolate cases of such illness which arrive in port. The Medical Officer of Health of the city is also the medical officer to the Port Sanitary Authority, and "by the Act for the Compulsory Notification of Infectious Disease, every master of a ship, and the surgeon on board, if there is one, are bound under "penalty to notify the existence of infectious disease "on board their ship to the Sanitary Authority." (Port Sanitary Authority, Report of the Medical Officer of Health, 1891.) Dr. Taylor goes on to say:—"The difficulty in dealing with imported cases is "that, owing to the shortness of the voyage from "America or Spain, passengers or members of the

* "It is satisfactory to know that the large expenditure on public "works incurred by the Corporation has transformed Liverpool from "what it was described in the year 1847, 'as the most unhealthy town "in the United Kingdom,' with a death-rate of 63·5, to one of the "healthiest of the large cities of the Empire, with an average death-"rate for the past ten years of 25·1 per 1,000." Trans. Seventh Internat. Congress of Hygiene, 1891.

CITY OF LIVERPOOL.

Diagram from Annual Report of Medical Officer of Health for 1891.



"crew may be landed apparently well, and yet within "a few days develop disease. This circumstance has "frequently occurred, but it has not been confined "to passengers from ships, but passengers by railway "have frequently introduced disease into the city, "and it is one of those risks which Liverpool, the great "highway of all nations, must necessarily be exposed "to." In the year 1891, 52 vessels had cases of infectious disease on board, yielding 69 cases, of which number 11 were of small-pox.

The transit of emigrants through Liverpool, amounting in 1891 to 206,418, (the annual average for the past decade being 200,000), must also expose Liverpool to the above risks, but it is noteworthy that of this large number only 28 emigrants arriving by land in Liverpool in 1891 were sent to hospital suffering from infectious disease (measles 25, scarlet fever 3). It should be added that Dr. Taylor points out that the method of examination of emigrants during transhipment is hardly conducive to a correct judgment of their ailments.

In view of the important share taken in the dissemination of infectious disease by lodging-houses, a few words on the regulation of these places in Liverpool may not be deemed out of place. By the regulations framed by the Town Council in 1869, under the provisions of the Common Lodging-houses Acts of 1851 and 1853, the Council or Health Committee determines the number of inmates which it is permitted to the lodging-house keeper to accommodate, he having with his application to be registered stated particulars of the house. Each house is "ticketed" with the number of lodgers it can accommodate, and a code of rules and instructions is issued respecting the cleansing of the house, the steps to be taken in the case of infectious disease among the inmates, &c. The supervision of the lodging-houses is entrusted to the Medical Officer of Health, who is empowered to see that the regulations are carried out. A penalty is attached to the neglect of any lodging-house keeper to notify the medical officer of any case of contagious disease, or of taking such measures for disinfection and cleansing as may be required. The medical officer is also empowered to reduce the number of inmates, if desirable, according to Byelaw 12:—

"Whenever the Medical Officer of Health of the said "city for the time being shall, under special circum-"stances, consider it necessary to reduce the number "of lodgers for any such room, the keeper of the "house shall, upon receiving notice to that effect "from the said Medical Officer of Health, receive and "accommodate in such room such reduced number and "no more, until the said medical officer shall other-"wise direct."

There are also byelaws for the regulation of houses let in lodgings, which provide for the registration and inspection of such houses, their regulation as to number of inmates (350 cubical feet per adult in sleeping apartment, or if there be a day room, 300 cubic feet), and other matters. Thus, these houses are all under the immediate direction of the Health Department.

of ion.

The Infectious Disease (Notification) Act, 1889, was adopted and came into force in 1890. The advantages of compulsory notification had frequently been urged by the Medical Officer, but it always met with opposition on the Health Committee. Before it was adopted the majority of cases of infectious disease were reported by the inspectors, and it often happened that an outbreak had attained some dimensions before the authorities became aware of its existence. At the present time about two-thirds of the cases are notified by medical men.

§ 2. *Sanitary Administration.*

The sanitary administration of the city of Liverpool is entrusted to the Health Committee of the Town Council, of which again there are two sub-committees, viz., the Sanitary and Works Sub-Committees. There is also a Hospitals Committee.

The Medical Officer of Health is J. Stopford Taylor, M.D., and the Assistant Medical Officer, E. W. Hope, M.D.

The city, which comprises the parish of Liverpool, with its 12 wards (Scotland, Vauxhall, St. Paul's, Exchange, St. Anne's, Lime Street, Castle Street, St. Peter's, Pitt Street, Great George Street, Rodney Street, and Abercrombie), and the out townships of Everton, Kirkdale, West Derby, and the Toxteths,—is for sanitary purposes divided into 18 districts, to each of which a district inspector is appointed. A certain portion of the duties sometimes pertaining to sanitary inspection is placed in the hands of a staff of four "prosecuting inspectors," thus enabling the district inspectors to confine themselves to their essential functions. These consist in a regular system of house-to-house visitation in their districts, and in following up complaints as to nuisances, or inquiries into epidemic disease.

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Duties of inspectors.

They attend at the office every morning to receive instructions, when they are seen by the assistant medical officer. At the close of the day's work they hand in their note-books to enable the proper entries to be made in the registers by the clerks, of whom there is a staff of eight or ten.

As regards the various departments of sanitary inspection, every opportunity is taken to fill vacancies with men who have had some previous technical training in the matters falling in his department; *e.g.*, one who has been a butcher is appointed meat inspector, or a former plumber to house inspection, an engineer for smoke inspection, whilst most of the "ambulance men" have served in the Marines as hospital bearers.

Procedure in cases of infectious disease.

In periods of epidemic each district inspector is instructed to report to Dr. Hope any case of infectious disease or suspected infectious disease with which he has met in his ordinary rounds.

The procedure when cases are notified by medical men is as follows:—All notifications are made direct to the Medical Officer of Health, and are registered as soon as received. The ambulance is then sent to the house to remove the patient to hospital, on the certificate of the medical man, the Medical Officer of Health only visiting the case if required, or if otherwise considered necessary. Dr. Hope informed me that there was very seldom any difficulty about removing patients to hospital, and during the present epidemic of small-pox every case notified has been so removed. Occasionally it has been necessary to send the mother with her sick child, but she does not return until after she has been re-vacciuated and disinfected.

Removal to hospital.

A special staff of inspectors undertake the disinfection of the houses, and the removal of articles from the infected house to the disinfecting station. Sulphur fumigation is employed for the first-named purpose, and when completed, notices are served on the owners of the property to strip the walls and clean the house down. (Appendix I.)

Disinfection.

There is a disinfecting house in the grounds at Parkhill City Hospital, and it is there that articles from houses invaded by small-pox are taken. But for other infectious diseases the articles are sent to one of the two disinfecting establishments in the city (one at present not being used). A new establishment fitted with a Lyons' disinfector is being prepared.

Liberal compensation is given for clothes, bedding, &c. which may have to be destroyed under the Public Health Act, either by replacing the articles or by money payment. A register is kept at the office in which is entered the operations of the department in these respects, under such headings as "Articles disinfected," "Articles conveyed by the Corporation Van," "Articles conveyed by the Owners," "Articles destroyed without Compensation," "Articles destroyed with Compensation," "Persons using Wash-houses," "Patients removed in Vans," "Cabs disinfected." On an average the working expenses amount to 80*l.* per fortnight, although the amount varies much according to the amount of compensation given.

If a liner belonging to one of the large shipping companies has a case of small-pox on board, the company remove all the fittings and articles that may by any possibility have been infected. The bedding, &c. is given by the company to the authorities, and after its disinfection it is sent to the matron of the Fever Hospital at Grafton Street to be distributed to persons in need.

Inspection of infected houses.

The house in which a case of small-pox has occurred is visited daily by one of the ambulance staff for the space of a fortnight, and at occasional intervals for a short time subsequently. The precaution is taken of providing the men whose duty it is to visit an infected house (with small-pox) with a change of clothing, and there is also at present a special officer detailed off to small-pox duty. The inspector does not confine himself to merely visiting the house, but makes inquiry of the

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neighbours as to cases of sickness in the vicinity. In this way fresh cases are discovered, or broken links in the chain of evidence as to the origin of cases are repaired.

Schools and infectious diseases.

Many cases of infectious diseases, especially measles, which is not in the schedule, are made known to the department through the agency of the School Board, and mutually the Board receives notice of such cases from the department. Thus the register of school children suffering from infectious disease or kept away from school owing to the presence of such illness in the house is sent from the Health Office daily in order that those names may be marked which no longer require supervision. Upon this the Board instructs its teachers that the child may be re-admitted. Then several cases of infectious disease are brought to light through the same agency, the teachers and visitors to the schools being furnished with forms to be filled in and returned to the Medical Officer of the names and addresses of children suffering from infectious disease or suspected to be so. The same purpose is served by means of postal cards addressed to the Medical Officer of Health on which a teacher notifies the absence of a child from illness of an infectious kind, and on its receipt the particulars are entered on the inspector's list so that he may forthwith make inquiry at the house indicated.

On the other hand, when there is infectious disease in a household from which there are children attending school notice is sent from the office to the master of the school informing him of the fact, and requesting him not to permit such children to attend the school until 14 days have elapsed from the time of disinfection of the house. This plan works admirably with the board and national schools, and has also been adopted with success in not a few private schools.

Inmates of infected houses engaged in work.

All inmates of infected houses who may be engaged in work are advised to abstain from going to work for a fortnight, and if they themselves are averse to take this advice they are often influenced by the disinclination of their employers, who have been notified of the fact, to receive them back during this period.

Steps taken with regard to lodging-houses.

Reference has already been made to the general supervision exercised by the Health Department over the common lodging-houses and houses let in lodgings, the keepers of which are bound under penalty to notify the authorities of any infectious illness among their lodgers. The case is at once removed to hospital, and the rooms disinfected, &c. If there has been any delay in notification, or the case has been some time in the lodging-house, the Medical Officer forbids the reception of any more lodgers for a fortnight, and of course the infected house is specially visited to detect any fresh cases that may arise during this period.

Hospital accommodation for fevers.

There are three city hospitals in Liverpool for the reception of cases of infectious disease, namely:—(1.) City Hospital North, Netherfield Road; (2.) City Hospital South, Grafton Street; (3.) City Hospital, Parkhill. At the present time only the last-named receives small-pox cases. It was founded for this purpose in 1884, but it has been largely utilised for the reception of cases of fever (scarlet fever chiefly) in the period of convalescence, at times when small-pox is not prevalent. Before referring to this institution in more detail it may be of interest to give a brief account of the hospital provision for small-pox in previous years.

For small-pox.

Former accommodation.

In the years 1870–71 Liverpool, in common with many of the large centres of population in the kingdom, was visited by a most severe and extensive epidemic of small-pox. In 1871 there were no fewer than 1,919 deaths from the disease. The history of the outbreak was given at the time by Dr. Trench, the Medical Officer of Health, who notes that it commenced with the deaths in Netherfield Road Hospital of two Spanish sailors, on July 30th and August 8th, 1870, respectively. He says that "the Netherfield "Road Hospital was at the time the only public place "in the borough to which persons suffering from "small-pox were or could be received. It is a chari-"table institution established and aided by private "subscription, and managed on the self-supporting "principle. There is a fixed charge for private "patients, and the select vestry had likewise con-"tracted with the managers of the hospital for the "reception and maintenance of all small-pox patients "who were chargeable to the parish."* This hospital could only accommodate 30 patients, and with the spread of the epidemic the other infectious hospitals belonging to the parish and to the guardians of Toxteth and West Derby were made available for cases of small-pox. These comprised:—

(*a.*) The permanent parish workhouse hospital at Brownlow Hill, containing 160 beds in 8 wards.

(*b.*) The temporary hospitals at Kirkdale, Ashfield Street, and West Derby Road, belonging to and also under the direction of and management of the select vestry of the parish, and capable of containing 950 beds.

(*c.*) The Union Hospital in Mill Road, belonging to the guardians of West Derby, and having a permanent accommodation of 150 beds.

(*d.*) The workhouse hospital in Smithdown Road, belonging to the Toxteth Board, having a permanent accommodation of 60 beds in six wards, and a temporary accommodation for 133 beds in wooden annexes to the several wards.

During this epidemic in the year 1871 there were 1,616 cases of small-pox treated at the workhouse hospitals.

Of all these institutions that at Netherfield Road (which has since been acquired by the Corporation and much enlarged) and that in Mill Road came to be chiefly utilised for the reception of cases of small-pox, although up to 1881 many were also treated at the workhouse hospitals at Brownlow Hill and Toxteth.

1876. *Removed to hospitals*† :—

250 cases of fever.
415 cases of small-pox.

Netherfield Road Hospital - -	268
Parish Workhouse (Brownlow Hill) -	191
Toxteth Workhouse (Smithdown Road) -	35
West Derby Union (Mill Road) - -	171

1877. *Removed to hospitals*† :—

255 cases of fever.
314 cases of small-pox.

Netherfield Road Hospital - -	198
Parish Workhouse (Brownlow Hill) -	223
Toxteth Workhouse (Smithdown Road) -	17
West Derby Union (Mill Road) - -	131

It would seem, however, that the position of these hospitals was responsible for some diffusion of small-pox in their vicinity. At any rate, during 1876–77 when cases were chiefly sent to Mill Road, in 1881 when they went to Netherfield Road, and again in 1883 when Mill Road Hospital received them, the incidence of small-pox was notably large in the area around these hospitals. Therefore, in the last-named year the Corporation took steps to establish a temporary hospital for small-pox on the confines of the city as far removed as possible from inhabited dwellings. The new departure is thus referred to by Dr. Taylor in his Annual Report for 1884:—

"The assistance given to the Corporation by the "West Derby Guardians in confining their hospital in "Mill Road to small-pox patients only was of the "greatest importance and rendered valuable aid "towards checking the spread of the disease. The "increase of small-pox, however, in the immediate "neighbourhood of the hospital was much to be re-"gretted, from whatever cause it originated, but, as "good is said to spring out of evil, so in this instance "it led to the erection of a temporary hospital by the "Corporation on the Parkhill Estate, which was kindly "let by the Mersey Docks and Harbour Board for that "purpose. This hospital was erected by the city "engineer and completed in two months, and is ca-"pable of meeting every requirement." It was opened for the reception of patients on September 23rd, 1884, and from that time to the present (January 1893) it has been the exclusive hospital for small-pox.

* Annual Report of the Medical Officer of Health, 1871.

† By officers of the sanitary authority only.

The Parkhill Estate is situated on the right bank of the Mersey, just within the southernmost boundary of the city. Bounded on the west by the river, some dockyards and petroleum stores, and to the south by open country, it comes within about 400 or 500 yards of inhabited dwellings on the north and east. It should, however, be added that the small-pox wards are placed on the western or riverside of the estate, and are, therefore, at a considerable distance from, as well as at a much lower level, than these houses (except those on the north). The original wards certainly bear evidence of their temporary character and the rapidity with which they were erected more than eight years ago. They are constructed of wood and Willesden paper, and are connected by covered ways. Their general arrangements are also not such as can be approved. These wards were only being used for a few convalescent cases at the time of my visit, the bulk of the patients being contained in two much larger, more commodious, and better fitted wards constructed of wood and brick, which are more in harmony with modern requirements. Two similar pavilions of two wards each are now being erected on the eastern and upper half of the estate for scarlet fever cases. In these the entrance is in the centre of the block, with the ward kitchen on the left hand, and the nurses' room opposite the entrance. A short passage leads into a ward on either hand, and one feature of the building is the establishment of a bath room and dressing room beyond the further end of the ward and close to a door of exit. The patient on being discharged will thus be enabled to undergo thorough disinfection, and will not again pass through the ward.

The total accommodation at present is 160 beds, far in excess of the ordinary demand for small-pox. Hence of late years the hospital has been filled with fever cases drafted from Grafton Street, which is about half a mile distant, and when, as for the past five years has been the case, there are not more than 10 cases of small-pox in the building at one time these are relegated to a small structure of wood and canvas (resembling a field hospital) standing by itself in the grounds at some distance from the main buildings. Thus, when in July 1892 there were only two or three cases of small-pox to be provided for, the wards were re-opened for scarlet fever; but in August, owing to the increasing number of small-pox patients, these fever cases had again to be relegated to Grafton Street. LIVERPOOL.

The conditions under which the Corporation holds the land—it is a monthly tenure—from the Mersey Docks Board are doubtless in a measure responsible for any reluctance to replace the old temporary blocks by buildings of a more stable and suitable character, but the erection of the two new pavilions above mentioned, and the similar wards now in occupation, are an earnest of the aims of the Corporation to make the best provision possible under the circumstances. The site is in many respects a suitable one, and certainly there is no reason to believe that the hospital has spread small-pox around it.

The large mansion near the entrance to the estate on the north-east is devoted to the administration, and all the food required is cooked here, unless the wards become filled, when a kitchen nearer to them is utilised. A large quadrangular brick building hard by the mansion forms the nurses' quarters. There is a disinfecting establishment in the grounds with a steam disinfector.

The visiting physician is Dr. N. E. Roberts, and the resident physician, Dr. Philip Walker.

Vaccination in Liverpool.

As regards the extent to which the community of Liverpool is vaccinated, I may be allowed to cite the following returns for the year 1892, so far as they are available. Those for the township of Toxteth have been furnished to me by Mr. Moulding, clerk to the Toxteth Board of Guardians, and comprise the figures for the first half of the year. A like return for the parish of Liverpool has been kindly supplied me by Mr. Hagger, clerk to the Vestry, who adds that in his district during 1892 there were 2,595 primary vaccinations performed by the public vaccinator, and 97 re-vaccinations, including those done at the workhouse. Mr. McKenna, Vaccination Officer of the West Derby Union, has also kindly furnished me with statistics of the year from his districts, which comprise districts beyond the municipal boundaries:— Vaccination returns.

VACCINATION RETURNS.—JANUARY TO JUNE, 1892.

	Births.	Successfully vaccinated.	Insusceptible.	Previous Small-pox.	Died unvaccinated.	Postponed.	Removals.		Unaccounted for.
							Known.	Unknown.	
Parish of Liverpool - - - -	2,556	2,110	8	—	314	23	42	58	—
Township of Toxteth - - - -	2,037	1,444	5	—	208	167	5	230	—
West Derby Union:									
No. 1 District (*a*) - - - -	3,201	2,619	11	—	320	52	3	182	14
No. 2 „ (*b*) - - - -	2,459	2,088	13	—	217	37	18	63	23
No. 3 „ (*c*) - - - -	1,997	1,691	7	—	150	32	—	87	30

(*a*) Registration sub-districts of Everton South, Everton North, and Kirkdale.
(*b*) „ „ West Derby, Municipal, West Derby, Rural, and Wavertree.
(*c*) „ „ Walton, Litherland, Great Crosby.

Thus about 81 per cent. of the total number of children born are returned as having been successfully vaccinated before the end of 1892, or, subtracting those "died unvaccinated," about 90 per cent. [*For further statistical details see Appendix II.*]

§ 3. *Small-pox in Liverpool, 1863 to 1892.*

The history of small-pox in Liverpool, as gleaned from the annual reports of the Medical Officer of Health, can be traced for many years. The appended table give the statistical data thus obtained from the year 1860. Up to the year 1871 these consist simply in the mortality returns. In that year and the succeeding the numbers of those treated in the hospitals are given, and in 1877 we begin to have a clearer notion of the actual incidence in a record of the number of cases of the disease reported; but compulsory notification did not come into force until 1890. It will now at length be possible to form a juster notion of the actual case-mortality from the disease, and to have some conception of the vast numbers that must have been attacked in 1871, when the mortality from small-pox reached so high a level. It will be seen from these figures how the epidemics have recurred with something like regular periodicity, for, in spite of its undoubted diffusion by contagion, the study of these variations seem to point to an additional and, probably, equally essential factor which operates in producing the greater outbursts. During this term of 33 years there have been at least four such periods of great increase in cases of the disease. The first of these extends over at least four years, 1864 to 1866, the second three years, 1871 to 1872, the third two years, 1876–7, the fourth two years, 1884–5, and it may be that a smaller "wave" is rising to its crest this year (1893). It must, however, be remarked that in several of the intermediate years the prevalence of small-pox was, if regard were had to the case-incidence and not the mortality alone, of nearly equal significance as the rest. Thus it may well be that in 1862, when the deaths reached 30, the total number of cases were at least 300; in 1867 on the same reckoning they might well have been 250; in 1869, 200; in 1874, 300; in 1875, 300; in 1881, 350; in 1883, 250; in 1885, 400; in

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1886, 300. This reckoning, which allows for a mortality of 10 per cent., may, however, be very fallacious, since the type of this disease, as of all zymotics, may vary from time to time. But, at any rate, it is manifest that the casual introduction of cases from other lands, which is sufficient perhaps to account for years of low mortality, can hardly always explain outbreaks which yield a sum total for the year of 200 or 300 cases. Looked at from this point of view, and reckoning the years during which there was least mortality from small-pox, we find the following years during this whole period as the best in this respect. In 1879 and 1890 there were no deaths from the disease, in 1887, 1888, 1889, only one death, in 1880 and 1891, only two deaths. The years 1873, 1878, 1861, 1882, 1860 stand out next most conspicuously as years of low mortality from small-pox.

TABLE I.

Liverpool: Small-pox, 1860–1892.*

	No. of Cases reported.	No. removed to Hospital.	Deaths		Total Deaths.
			Above 5 Years.	Below 5 Years.	
1860	—	—	—	—	8
1861	—	—	—	—	4
1862	—	—	—	—	30
1863	—	—	—	—	109
1864	—	—	—	—	482
1865	—	—	—	—	459
1866	—	—	—	—	102
1867	—	—	4	18	22
1868	—	—	3	15	18
1869	—	—	9	11	20
1870	—	—	98	76	174
1871	—	1,616	1,183	736	1 919
1872	—	138	35	15	50
1873	—	21	7	3	10
1874	—	34	21	9	30
1875	—	46	21	8	29
1876	—	415	260	126	386
1877	1,000	314	197	102	299
1878	35	25	1	2	3
1879	12	11	—	—	—
1880	14	8	2	—	2
1881	262	199	26	8	34
1882	67	56	2	4	6
1883	126	105	17	9	26
1884	832	743†	81	25	106
1885	375	342	39	7	46
1886	234	215	20	9	29
1887	23	23	1	—	1
1888	27	19	1	—	1
1889	9	8	1	—	1
1890	2‡	2	—	—	—
1891	21	21	2	—	2
1892	193	193	5	11	16

* The number (1,616) removed to hospital in 1871 represents only those removed to the hospital within the parish.

The numbers removed during the years 1872-75 are those removed to the parish hospitals only, with the addition of those removed by the sanitary officers.

The numbers for 1876 and 1877 represent only those removed by the officers of the sanitary authority.

In none of the years 1871-77 are the numbers removed by the officers of the guardians to the out township workhouse hospitals belonging to the West Derby and Toxteth Guardians included, and consequently the figures given do not represent the whole of the cases removed to hospital for those years.

All the figures commencing from 1878 are correct as regards removals to hospitals.

The deaths include those in hospitals and private houses, and occurring in any part within the city boundaries for those years.

† City Hospital, Parkhill, opened.

‡ Compulsory notification established.

Apart from any supposed "epidemic influence" to account for the marked variations in extent of different small-pox invasions, it would be idle to ignore another and probably very important factor which, as knowledge grows, must play an ever-increasing part in limiting the spread of epidemics of contagious disease. I refer to the efforts of the sanitary authority, and especially the greater promptitude in the isolation of infected persons, as shown by the increasing proportion of cases treated in hospitals to those attacked; and there is no doubt that this will have a very material influence in the future. It is on this ground alone legitimate to question whether we shall ever see again in this country so severe an outbreak of small-pox as that of 1871–72.

From facts gathered from the Medical Officer's Reports and others kindly supplied to me by him the per-centage of those treated in hospital since 1877 is as follows:—

			Per cent.
1878.	35 cases reported.	25 treated in hospital, or	71·4
1879.	12 „	11 „	91
1880.	14 „	8 „	57·1
1881.	262 „	199 „	76
1882.	67 „	56 „	83·6
1883.	126 „	105 „	83·3
1884.	832 „	743 „	88·3
1885.	375 „	342 „	91·2
1886.	234 „	215 „	91·8
1887.	23 „	23 „	100
1888.	27 „	19 „	80·4
1889.	9 „	8 „	88·8
1890.	2 „	2 „	100
1891.	21 „	21 „	100
1892.	193 „	193 „	100

I propose now to cite from the annual reports certain passages and tables bearing on the more important of these outbreaks.

1870–71.—Prior to the occurrence of the two fatal cases in Spanish sailors at Netherfield Road Hospital, in July and August, 1870, there had been admitted to that hospital, between January 1st and June 30th, nine cases, viz., one in January, one in February, two in March, two in May, and three in June. None of these cases were fatal. Of the whole nine cases, three were foreign emigrants, three were seamen from on board ships, two were houseless tramps from the vagrant ward of the workhouse, and one, a girl aged six years, was a pauper patient from No. 3 Court, Birkett Street. Of the deaths from small-pox registered between the 30th July and the end of November 1870, 30·7 per cent, were seamen, or of the families of seamen, while of the deaths registered from small-pox in December 1870, and during the whole of 1871, the per-centage of sailors and their families was 8·3. Dr. Trench then sketches the course of the epidemic which, during 1871, was in the main localised to Everton, and thence invaded the city; and he goes on to discuss the reason for these outbreaks by comparing them to a conflagration, due to neglect of protective measures (*e.g.*, vaccination) in the intervals between epidemics. At the same time he admits that the contagion may occasionally be of special virulence, "altogether apart from the number " and condition of the persons susceptible of the " disease. It is in such cases that more than ordinary " precautions are to be taken to secure protection. " The only possible mode of protection is by vaccina- " tion, and vaccination alone; but experience has " proved that as a defence against waves of contagion " of a special malignancy it is necessary for the people " to be re-vaccinated so as to ensure the efficiency of the " antidote. The contagious germ to which we trace " the epidemic of small-pox of 1871 was brought from " the Continent of Europe, and was of peculiar ma- " lignancy. None of us, not even the oldest physicians, " remember so many cases which presented the " hæmorrhagic and confluent characteristics of the " disease, nor so many cases where primary vaccina- " tion performed in childhood failed in adult age to " ensure protection. The extreme mortality from the " disease in Liverpool was no doubt greatly due to the " home conditions of our poor, and to the wretched " weakness and debility to which they had been " brought by the previous epidemic of relapsing or " famine fever, but it was also greatly due to the " peculiar virulence of the disease itself. It is, under " these circumstances, especially gratifying to know " that re-vaccination, timely and efficiently done, " proved a constant and perfect protection from the " disease."

Dr. Trench also gives the following analyses of the cases treated in the workhouse hospitals during 1871:—

Parish of Liverpool. Workhouse Hospitals. Small-pox Epidemic of 1871.

	Below 1 Year.	1 to 6.	6 to 10.	11 to 15.	16 to 20.	21 to 30.	31 to 40.	41 to 50.	51 to 60.	Total.
Unvaccinated or uncertain	13	84	73	53	49	100	40	16	4	432
Vaccinated:—										
1 cicatrix	1	16	39	64	91	97	35	8	4	355
2 „	—	13	51	126	151	170	40	12	2	565
3 „	2	6	31	40	57	48	—	2	—	200
4 „ and upwards	1	6	14	4	13	14	5	1	—	58
Cicatrices not specified	1	1	1	1	1	—	—	1	—	6
	18	126	209	297	362	429	125	40	10	1,616

Total cases, 1,616. Deaths, 375.

Of the above were—

Not vaccinated	264	148 deaths.
Vaccination doubtful	168	96 „
Vaccinated—1 cicatrix	355	53 „
„ 2 „	565	56 „
„ 3 „	200	14 „
„ 4 „	46	4 „
„ 5 or upwards	12	1 „
„ imperfectly	4	2 „
„ well	2	1 „
	1,616	375

In 1872.

1872.—There were 135 cases in the workhouse hospital, 55 of whom were emigrants or seamen from on board ship; also three seamen taken to Netherfield Road Hospital.

TABLE OF CASES admitted to West Derby Union Hospital, Mill Road, from end of May 1876 to February 1877, and the Number of Deaths.

Admissions.

Total.	Below 8.				Above 8 and under 16.				Above 16 Years.			
	Vaccinated.	Unvaccinated.	Doubtful.	Total.	Vaccinated.	Unvaccinated.	Deaths.	Total.	Vaccinated.	Unvaccinated.	Doubtful.	Total.
1,021	61	70	10	141	223	52	16	291	447	96	46	589

Deaths.

158 or 15·5 per cent.	1 or 1·6 per cent.	31 or 44·3 per cent.	2 or 20 per cent.	34 or 24·1 per cent.	6 or 2·7 per cent.	13 or 25·0 per cent.	2 or 12·5 per cent.	21 or 7·2 per cent.	38 or 8·5 per cent.	53 or 58·3 per cent.	9 or 19·6 per cent.	103 or 17·5 per cent.

Total cases	1,021.	Deaths	158 or 15·5 per cent.	
Vaccinated	731.	„	45 „ 6·3	„
Unvaccinated	218.	„	100 „ 45·9	„
Vaccination doubtful	72.	„	13 „ 18·1	„

Writing in 1877 Dr. Taylor points out the occurrence of much imperfect vaccination, and urges the desirability of re-vaccination at earlier ages than 12, especially in epidemic times.

In his report for 1885 he gives an analysis of the cases of small-pox admitted into Parkhill Hospital from the date of its opening, on September 23, 1884, to the 31st December 1885. He says:—

"In considering the influence which vaccination has "upon small-pox it is necessary to determine the pro- "portion which the vaccinated population bears to the "unvaccinated. It is a fair estimate that 92 per cent. "of the people have been more or less efficiently vac- "cinated; that is to say, there were 46,378 persons out "of the estimated population of 579,724 who had not "been vaccinated, and constituted a standing danger "from their susceptibility to the contagion of small- "pox. If vaccination were useless and had no preven- "tive influence, the incidence of small-pox would be "the same amongst the vaccinated and the unvac- "cinated, and 92 per cent. of the patients admitted "into hospital would be furnished by the vaccinated, "and 8 per cent. by the unvaccinated. What we do "find, however, is that the proportional incidence of "small-pox upon the unvaccinated is more than 50 per "cent. in excess of the incidence upon the vaccinated. "The subjoined table refers to this, and also to another "point, which is of infinitely greater importance, "namely, the striking contrast which the character "and progress of the disease present in the vaccinated "and the unvaccinated.

		Patients admitted.	Died.	Rate of Mortality.
Vaccinated	Well	90	2	2·2 per cent.
	Indifferently	201	12	6·0 per cent.
Vaccination doubtful (no scars)		20	5	25·0 per cent.
Not vaccinated		63	27	42·8 per cent.
Total		374	46	12·3

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Excluding all doubtful cases, the unvaccinated constitute 17·8 per cent. of the total admissions, and they contribute 58·7 per. cent to the total deaths.

In the next table the influence of vaccination in modifying the course of the disease is more fully shown; the age of the patient, the condition as regards vaccination, the character and the result of the illness are shown in each case.*

City Hospital.

Table showing Age of each Patient, Conditions in regard to Vaccination, and Nature of Illness in each Case.

Age.	Vaccinated. Number and Character of Scars.								Re-vaccinated.	Vaccination doubtful.	Not Vaccinated.
	Good.				Indifferent.						
	1	2	3	4 or more.	1	2	3	4 or more.			
Under 1 year.	—	—	—	—	—	—	—	—	—	—	1 S.
1 and under 10.	1 M.	1 M.	2 M.	3 M. 1 S.	2 M. 1 S.	2 M.	7 M. 3 S.	2 M.	—	5 S.	22 S. 11 F.
10 and under 20.	4 M. 1 S.	2 M.	17 M. 2 S. 1 F.	14 M. 2 S.	2 M. 5 S.	8 M. 8 S.	17 M. 5 S.	15 M. 2 S.	—	1 M. 5 S.	7 S. 6 F.
20 and under 40.	8 M. 2 S. 1 F.	9 M. 6 S.	5 M. 2 S.	1 M.	7 M. 10 S. 5 F.	16 M. 24 S. 3 F.	12 M. 5 S. 2 F.	6 M. 1 S.	—	2 S. 4 F.	5 S. 10 F.
40 and upwards.	1 M. 2 S.	2 M.	—	—	3 M. 5 S. 2 F.	2 M. 9 S. 2 F.	1 M.	—	—	2 S. 1 F.	1 S.

M. = mild. S. = severe. F. = fatal.

* For a similar table dealing with a larger number of cases prepared by Dr. Hope, *see* Appendix III.

In no case did any nurse or servant of the hospital contract small-pox, although many of them were in close and constant attendance upon the sick. All were re-vaccinated when entering upon duty.

In 1891.

1891.—Of the 21 cases reported in this year, the origin was doubtful in only three, viz., two from different streets reported in March, and one in December. Of the rest, one in February was a sailor on board the S.S. "Sorata," from Valparaiso; one in April, a sailor from the S.S. "Norman Prince," from Huelva; and seven in May, all referable to contact with this vessel. In October a foreign sailor on his way to join a ship was attacked and sent to Bootle Hospital. On November the S.S. "Gulf of Trinidad" arrived with two cases on board, and later six other cases arose in connexion with the same ship.

"On November 11 the S.S. 'Majestic' arrived from "New York having the body of a lady passenger on "board who had died from the disease during the "voyage."

In marked contrast to the experience of the following year, there was no spread of the disease from any of these cases.

§ 4. *Small-pox in Liverpool*, 1892–93.

In 1892-3.

The subjoined lists of cases reported to the Medical Officer of Health since the beginning of January 1892 have been supplied me by Dr. Taylor. The first comprises the number reported in each week, distinguishing those that were notified, and those which were not notified. The latter include also two cases which appear in the hospital list (*see* Appendix V., Nos. 27 and 49), but not in this, thus bringing the total number of cases in the city during the year to 179, of which number 126 were notified. During the four weeks ending January 28th there were 12 cases reported, of which five were notified. The other list includes the cases coming from the Test House, Belmont Road, outside the municipal boundary, cases which can be traced in connexion with an outbreak among lodging-house people in October to December.

TABLE II.

SMALL-POX.

CITY OF LIVERPOOL.

——	No. of Cases reported.	Number notified.	Number not notified.	Remarks.
1892.				
Week ending—January 2	—	—	—	
„ 9	—	—	—	
„ 16	1	1	—	
„ 23	7	3	4	
„ 30	7	3	4	
February 6	5	5	—	
„ 13	8	7	1	And also one case contracted small-pox after admission to hospital with her infant.
„ 20	5	4	1	
„ 27	12	7	5	
March 5	3	1	2	One doubtful case admitted to hospital not included in this list.
„ 12	—	—	—	
„ 19	6	5	1	
„ 26	3	2	1	
April 2	1	1	—	
„ 9	3	2	1	
„ 16	1	1	—	
„ 23	2	2	—	
„ 30	1	1	—	
May 7	2	2	—	One a *foreign emigrant.*
„ 14	2	2	—	
„ 21	—	—	—	
„ 28	1	1	—	

——	No. of Cases reported.	Number notified.	Number not notified.	Remarks.
1892. Week ending— June 4	8	8	—	Five of the patients from the SS. "Toronto.
„ 11	6	1	5	
„ 18	2	1	1	
„ 25	—	—	—	
July 2	—	—	—	
„ 9	—	—	—	
„ 16	—	—	—	
„ 23	—	—	—	
„ 30	1	1	—	A steward, SS. "Agia Sofia," from Constantinople.
August 6	2	—	2	Wife of the steward and inspector who removed infected clothing, &c. for disinfection.
„ 13	—	—	—	
20	—	—	—	
„ 27	—	—	—	
September 3	—	—	—	
„ 10	—	—	—	
„ 17	—	—	—	
„ 24	—	—	—	
October 1	—	—	—	
„ 8	—	—	—	
„ 15	11	11	—	First case notified on 10th. One of the 11 a destitute seaman from Constantinople.
„ 22	6	6	—	
„ 29	9	7	2	
November 5	10	8	2	
„ 12	2	—	2	
„ 19	9	2	7	
„ 26	7	7	—	One, a seaman from SS. "Lake Ontario."
December 3	5	5	—	
„ 10	9	3	6	One, a seaman from SS. "Teutonic."
„ 17	3	2	1	
„ 24	11	9	2	
„ 31	6	5	1	
1893. Week ending— January 7	1	1	—	
„ 14	7	2	5	
„ 21	1	1	—	A seaman from South Shields.
„ 28	3	3	—	

Small-pox.

City of Liverpool.

Cases from the Belmont Road Test-house, belonging to the West Derby Guardians and the Select Vestry of Liverpool, brought into the City Hospitals.

Date.	No. of Cases.	Hospital.	Remarks.
1892. November 3	3	Parkhill.	
„ 14	1	„	
„ 19	2	„	
December 1	2	„	
„ 2	3	„	
„ 5	1	„	
„ 8	2	„	

The first case of small-pox in 1892 reported to the authorities was that of a man, 25 years of age, living in Morton Street. The case was notified on *January 12th*, his illness having commenced on the 4th. He had been vaccinated in infancy, presenting two good marks, passed through an attack of discrete small-pox, and was discharged from the hospital on March 17th. The clue to his illness became apparent subsequently, when, on January 18th, there were removed from a court in Bond Street, the mother and two children of a family who shortly before had sent a child three years old to the workhouse suffering from an illness which proved fatal on the 19th. An inquest was held in this case, and in accordance with the medical evidence its death was attributed to "cancrum oris." In the light of subsequent facts it is highly probable that this child died from small-pox, for on the 23rd an inmate of the workhouse was removed to hospital suffering from small-pox, and another on February 4th. Moreover, the mother of the family in Court 3, Bond Street, said that the child first attacked and removed to the workhouse was taken ill in the same way as the other two. It appears that the man whose case was first reported was believed to have come in contact with some members of this family or their relatives at a music hall; but whether he infected them or was infected by them cannot be certainly determined. At any rate this was the starting point for an outbreak in Bond Street and the vicinity, and also in the workhouse, which lasted for three months. The last case traceable to infection from this source was reported on March 30th, the total number of cases in this group being 54. Liverpool

During this same period seven other cases of small-pox were reported. Three of these were infected at the City Hospital, Parkhill, viz.:—Dr. O., the house surgeon of Netherfield Road Hospital, who visited Parkhill wards, and who was attacked on February 22nd; Dr. W., the resident physician at Parkhill, attacked on February 24th, and who had had variola in childhood; this attack was very mild; and E. T., a wardmaid in the hospital, who had been re-vaccinated. She was considered by Dr. W. to have been inoculated with small-pox in the discharge of her duties, her illness commencing on March 15th.

Of the remainder, one patient, W. T., reported on March 21st, came from Aikin Street, in the south of the city, near Parkhill, but there is no evidence of infection (direct or indirect) from the hospital. The others were:—A female, 17 years of age, sent from the Royal Infirmary on January 21st, when she had gone on being, taken ill; a female, 33 years of age, living at Chirkdale Street, in the extreme north of the city, reported on February 11th; and a man, æt. 25, sent from the workhouse, but with a very slight attack. It was very doubtful if this man had been vaccinated; he was a half-caste, and had some questionable marks on the arm. The origin of infection in these cases could not be traced.

During the month of *April* seven cases were reported; four in connexion with a lodging-house in St. Anne's Street, two having first gone to the workhouse infirmary, and two from a house in Grafton Street, and one from a house in Wolfe Street. These cases were not connected with the preceding cases, and their origin is obscure.

In *May* there were 13 cases. Of these, five were sailors on board the S.S. "Toronto," sent into hospital on May 31st, three of them having been ill a fortnight, one 10 days, and one a week. One case was admitted to Parkhill from the workhouse on May 2nd; one case came from Chirkdale Street (where there had been a case in February) on May 31st; and one case from Carver, Robsart, Conway, Virgil, Barry, and Raymond Streets respectively. Most of these cases were disconnected.

In *June* there were eight cases. Of these, six were members of one household in Raymond Street; removed on June 11th to 13th, occupying a house close to that from which a case was removed on May 30th. One was removed on June 13th from Barry Street. The son of a man removed on May 30th. The other case was removed from Mitylene Street, on June 8th.

In *July* there was only one case, and in *August* another from the same house, when one of the inspectors, employed in disinfecting the house, was also attacked.

Thus, of the 91 cases reported during the year up to August 6th, 54 were accounted for from one source of infection; 26 were connected in separate groups, leaving only 11 apparently unconnected with either of these.

There were no cases in September, but in *October* 31 were reported, 24 of which formed part of another group of cases, similar to the outbreak at the beginning of the year. The district involved on this occasion was Group II.

LIVERPOOL. in St. Anne Street and its vicinity, where many lodging-houses abound, and where many of the inhabitants belong to the poorest class. Hence it happened that several of the patients came from the Test House in Belmont Road, which had been infected by an inmate coming from one of these lodging-houses. The workhouse at Brownlow Hill, also for a like reason, again furnished a contingent. Of the six remaining cases, three came from a house in Adelaide Street, the first being a barman out of employment, and who may have been infected at some place of public resort. He was taken ill on October 3rd, and removed to hospital on the 10th; a brother and sister being attacked on the 16th and 21st respectively. A lad, aged 18, was removed from the Newsboys' Home, Everton, on October 11th, having been attacked on the 8th. The lad left Dudley a fortnight previously, and had tramped to Liverpool. A sailor, taken in the first instance to Netherfield Road Hospital, was removed on the 12th to Parkhill, where he died from hæmorrhagic small-pox on the 14th. The sixth case, not traceable to the St. Anne Street group, was that of a cab-driver, living in the south-east of the town, whose case was notified on October 31st, and the seventh a female removed from Arthur Street on the same day.

There were 32 cases removed to the hospital in *November*, and of these (including six from the Test House) 20 were connected with the St. Anne's Street
Group III. group; four others with another group connected with one of the Belfast line of boats; and of the remainder one was an inspector, no doubt infected in the discharge of his duty, another from a house near to the last-named, two from houses near Parkhill, one from S.S. "Ontario;" two from one house in Dacy Road, one of whom had been in the habit of frequenting public-houses. A girl, aged 13, living in a lodging-house near the Clarence Dock, was removed on November 2nd; but the previous source of her infection could not be ascertained.

During *December* there were 38 cases reported. 10 of them, and possibly 11, were obviously connected with the outbreak which commenced in St. Anne Street in October; 13 were similarly connected with the "Belfast boat" series, whilst nine occurred in
Group IV connexion with a "missed case" at the Stanley Hospital. As I shall give particulars of each of these groups more fully presently, I need not enter into further detail now. There remain five cases to be accounted for. One was landed from the S.S. "Teutonic" on December 12th; one was engaged at railway work at St. Helen's, where small-pox prevailed; another was a mason, whose father worked at Warrington; and the other two men of the same family, father and son, the former taken ill on December 7th, and dying from bronchitis and pneumonia after passing through the attack of small-pox, and the son attacked on December 21st. The source of infection in the father's case was not known.

During the month of *January* 1893 there have been 13 cases, and of these one possibly is indirectly connected with the St. Anne Street group, two with the "Belfast boat" group, and five with the "Stanley Hospital" group. The remaining five include the house surgeon of Netherfield Hospital, who apparently contracted small-pox on visiting Dr. W. at Parkhill; a sailor who arrived a few days previously at South Shields from London and Hull; and a man who entered a lodging house from Manchester. Two other cases were untraced.

So that, to sum up, so far as the record goes, the total number of 206 cases may be classified as follows into—

(*a.*) Cases occurring in several households, but directly linked into large groups; four of which can be clearly established.

(*b.*) Multiple cases occurring together in same house, or otherwise shown to have been in direct contact.

(*c.*) Isolated cases, the source of infection can be traced (probably) in some, but not in others.

Series A.—142 (or 144) cases.

Group I.—54 cases occurring in January, February, March.

Group II.—54 (or 56) cases occurring in October, November, December (and perhaps January).

Group III.—20 cases occurring in November, December, January.

Group IV. 14 cases occurring in December, January.

Series B.—35 cases, in 11 groups.

Series C.—27 cases, origin of which can be traced in eight.

To render this account complete it seems to me necessary that I should enter into more detail respecting each of the groups enumerated under Series A., which may conveniently be described as:—I. The Bond Street Group; II. The St. Anne's Street Group; III. The Belfast Boat Group, and IV. The Stanley Hospital Group.

I. *The Bond Street Group.*—The cases in this group came from 24 different households. One case came from 13 houses, and five of them first entered the workhouse hospital; four houses sent two cases, and from one, one case proceeded first to the workhouse hospital; three houses yielded three cases each; and three houses yielded four cases, two from one house going to the workhouse. Lastly, from one house came six patients. Besides, however, serving as a sort of receiving house for those sickening of small-pox, the workhouse itself became infected. The first case arising there (No. 8), although originally coming from a house in Bond Street, was probably infected by the child who died on January 19th. No. 8 was a girl, nine years of age, who had been an inmate of the workhouse for some time. She was attacked with small-pox on January 20th. There were six other inmates of the workhouse who were subsequently attacked, at periods ranging from February 1st (No. 18) to February 29 (No. 49), and who may have been infected by the cases which came in from the Bond Street area in January and February. (Plate IV.)

II. *The St. Anne's Street Group.*—In his reply to a letter addressed to him by the Secretary of the Royal Commission on Vaccination, Dr. Stopford Taylor, writing on Dec. 5, 1892, thus refers to the earlier cases in this outbreak:—

"On 11th Oct. we removed from the Newsboys' Home a boy who had left Dudley a fortnight previously and tramped to Liverpool, where he was found in a desolate condition, and taken to the home, where he had been a few days, when the disease developed itself. On the same day, the 11th Oct., we removed a man from 107, St. Anne Street. This is a large common lodging-house, registered to accommodate 170 people, and situated in a district full of lodging-houses. No account could be obtained of the origin of the disease except that some people had a short time previously been staying at the house, who, from their conversation, were said to have come from Warrington, but we could not obtain any trace of them.

"On the same day we removed a woman from 32, Queen Anne Street, within a short distance of the lodging-house, 107, St. Anne Street; she was supposed to have associated with the people at 107.

"On the 12th Oct. we removed three more cases from 107, St. Anne Street, and one case from 61, St. Anne Street, also a common lodging-house, besides a destitute man who had been in the Northern Hospital a few days, where he developed the disease, and subsequently died after removal.

"On 13th Oct. we removed a man from Burleigh Road South; he could give no account how he had contracted the disease, but as he was a light porter was supposed to have come in contact with some lodging-house people.

"On 14th Oct. a case from 107, St. Anne Street, was removed, and on the 16th another from the same house.

"On 18th Oct. a case from 165, Richmond Row, which is a common lodging-house, and within a short distance of 107, St. Anne Street; and on the same day a man from the Workhouse Hospital, where he had gone from 57, Pitt Street." . . . . .

Cases traceable to these lodging-houses, and to people in contact with their inmates, continued to arise until the close of the year. Indeed, if two cases—one from Glegg Square (No. 177), who was working with some people from a house in Arlington Street, whence two cases were removed (Nos. 145, 162), and one from Great Howard Street (No. 194), adjoining Glegg Square—be included, the group would extend from Oct. 5th to January 1st, the dates of onset of the first and last cases respectively.

The inclusion of the two last-named cases make the total number of the group 56, which are thus distributed:—

15 houses, each yielding one case, of whom five went to the Workhouse Hospital, and one to the Test House.

LIVERPOOL. SMALL POX. 1892.

"Bond Street" Group.

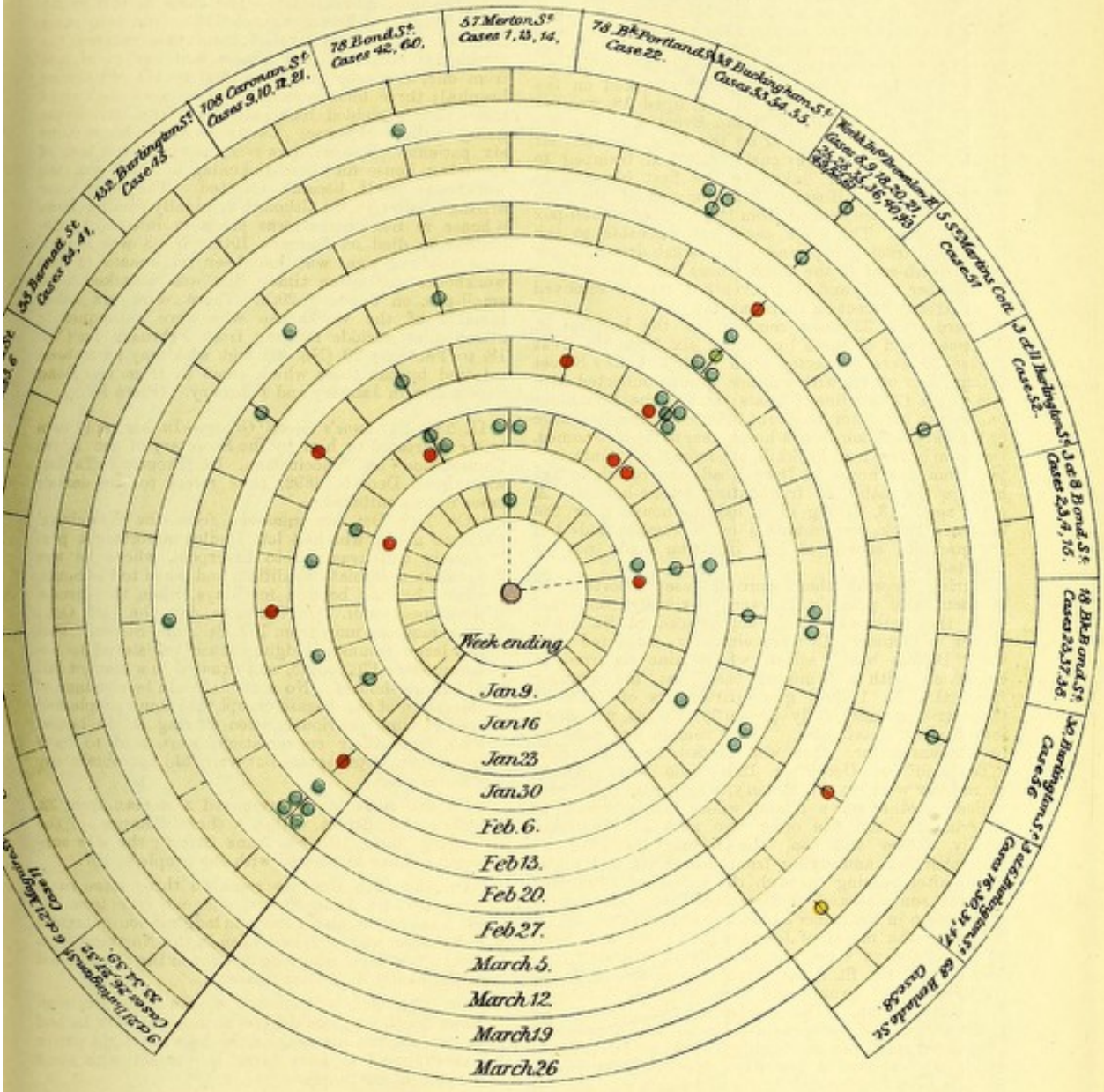

DIAGRAM *to illustrate the distribution of Cases of Small Pox arising during a period of 12 consecutive weeks which were presumably connected with the case of a child age 3 years from 3 & 8 Bond St. who died in the Workhouse Infirmary at Brownlow Hill, on Jan. 19th 1892 from "Cancrum Oris"*

Vaccinated

Unvaccinated

Vaccination alleged or doubtful

To face page 38

LIVERPOOL. SMALL POX. 1892.

"ST ANNE STREET" GROUP.

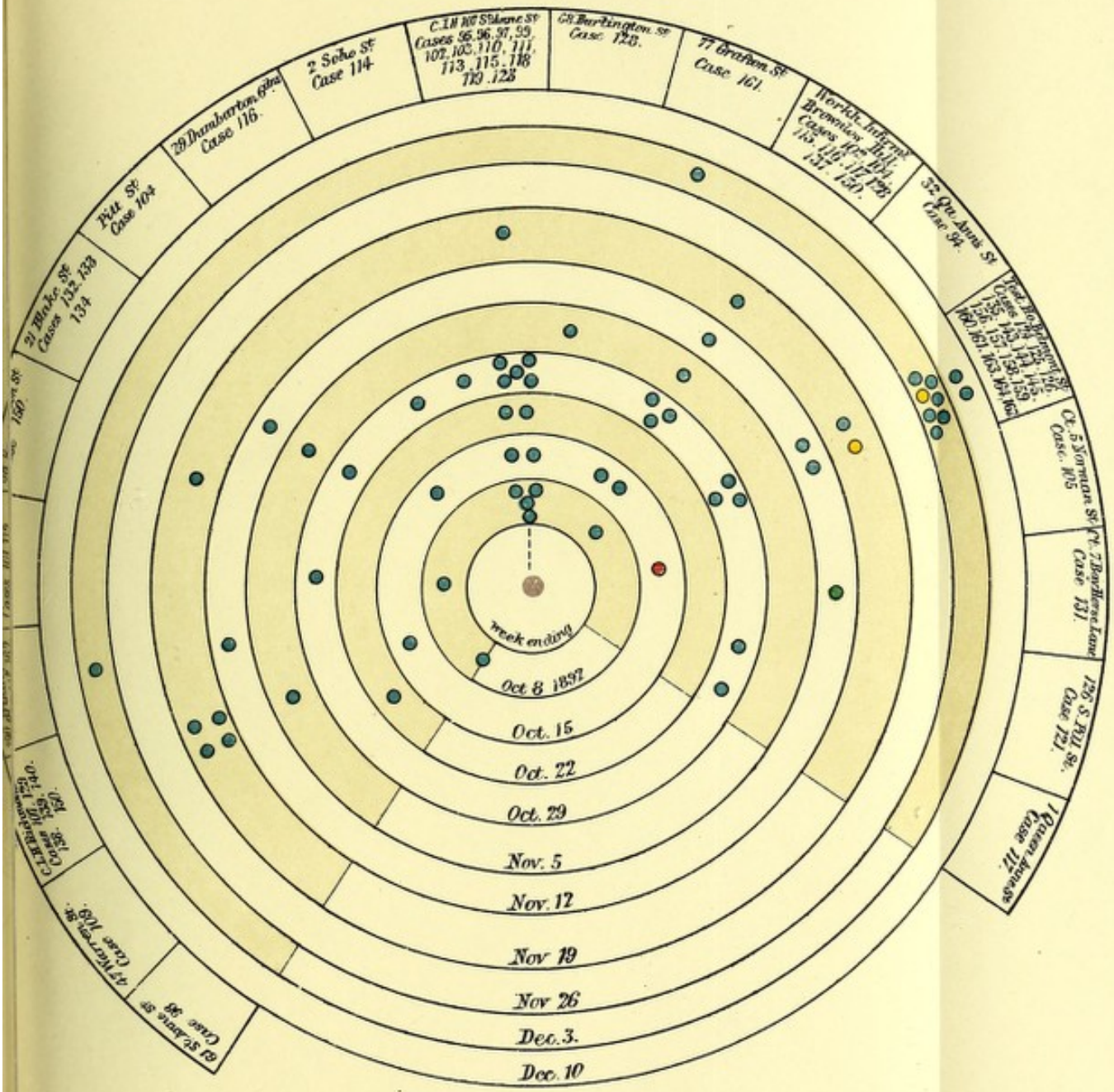

Diagram to illustrate the cases of Small Pox arising during a period of ten consecutive weeks, which were traceably connected with a Common Lodging House in St Anne Street Liverpool, the disease being in all probability imparted there by a tramp from Warrington.

Vaccinated	●	
Alleged Vaccination	●	*For Case References,*
Under ..... ,,	●	*See Table in Appendix V*
Unvaccinated	●	

To face page 38.

Wyman & Sons, Ct, Lith. 90 / 9. 8. 87.

LIVERPOOL, SMALL POX, 1892.

"Belfast Boat" Group.

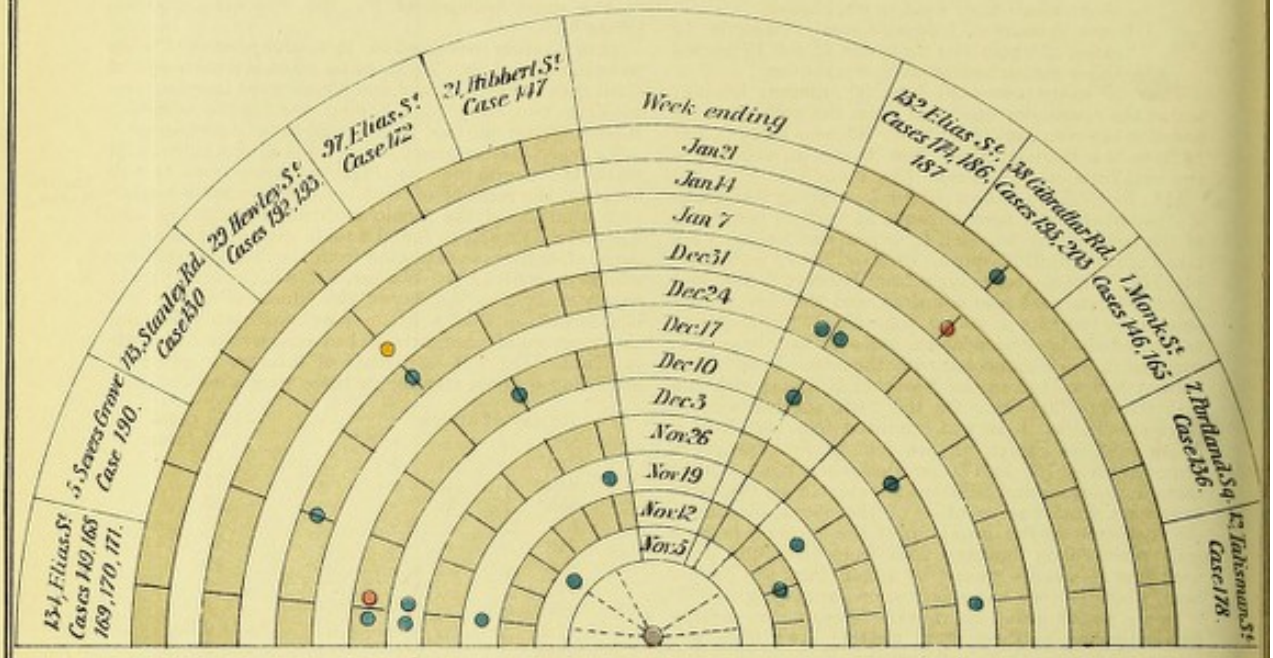

DIAGRAM *to illustrate the distribution of cases of small pox arising during a period of 12 consecutive weeks which were traceably connected with cases occurring amongst men employed on one of the Belfast boats*

"Stanley Hospital" Group.

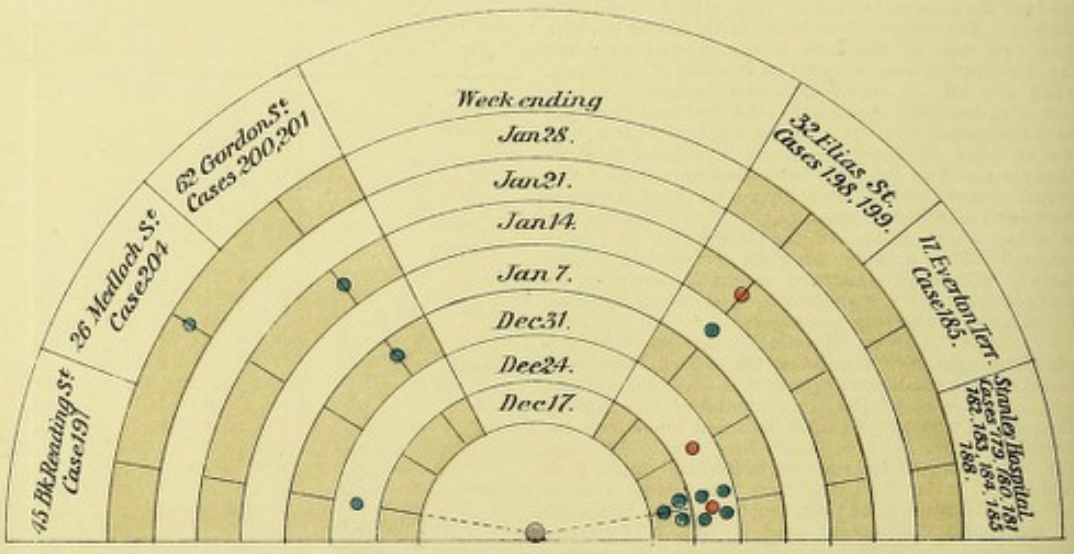

DIAGRAM *to illustrate the distribution of cases of small pox arising during a period of 7 weeks which were traceably connected with the case of an inmate of the Stanley Hospital, who died on Dec. 12th 1892, believed at the time to be suffering from "malignant scarlet fever."*

Vaccinated ●

Unvaccinated ●

Vaccination alleged or doubtful ●

Wyman & Sons, Ltd. Lith. 63, Carter Lane 1893.

2 houses, each yielding two cases, of whom one went to the Test House.
1 house, yielding 3 cases.
1 house (common lodging-house), yielding six cases, of whom one (from one of the 15 houses above mentioned) went to workhouse.
1 house (common lodging-house), yielding 14 cases, of whom two (from one of the 15 houses above mentioned) went to workhouse.

Thus, 41 cases proceeded from 20 different houses; and of the remainder one came from the workhouse (in addition to seven sent there from different houses), and 14 from the Belmont Road Test House (in addition to two sent from other houses). (*See* Plate V.)

III. *The "Belfast Boat Group."*—During the month of November some men engaged at work on board one of the boats going between Liverpool and Belfast were taken into Parkhill Hospital. On Nov. 23 two men (Nos. 146, 147), coming respectively from Hibbert Street and Monk Street, were also admitted, and they recognised among the patients a young man (No. 130) who was of no settled abode or occupation, but who had been also engaged in work connected with the same boat. This patient had walked to the Northern Hospital with the rash out on Nov. 5th. On the 24th another worker from the Belfast boat was admitted (No. 149), from a house in Elias Street, whence four other cases were removed (Nos. 168 to 171) on December 9th.* Other cases in the same and adjacent streets, closely traceable to contact from one or other of the above, also men; the last case of the group (up to the present) being a girl, removed on January 25th from Gibraltar Row, next door to a house visited by a man from the Belfast boat, whence a case was removed on January 9th.

In the whole group there were 20 cases, five coming from one house, three from another, two from two houses and one each from 8 houses.

It was not for some time that the connexion between these cases in Elias Street and vicinity and the Belfast boat service was made manifest. It was finally clinched by the removal on the 19th December of a woman whose husband was employed on the boat in question, and by the receipt on the 21st of a telegram from the Port Medical Officer of Health of Belfast informing Dr. Taylor that two cases of small-pox had been removed from this boat on its arrival at Belfast from Liverpool. As soon as the boat returned to Liverpool on the 23rd, it was visited by an inspector, who learnt from the captain that about three weeks previously one of his firemen living at Belfast had been at home ill, and had rejoined the boat on December 12th after a fortnight's absence. The ship was disinfected at Belfast on the 21st then two men of the crew developed small-pox; and the disinfection was repeated on the 23rd at Liverpool, when also all the crew were re-vaccinated, except six men who declined. Seeing that the first case known to have contracted small-pox among workers on this boat was attacked on November 1st, it is probable that the boat remained an infected focus,—unsuspected—for a period of seven weeks. Possibly not a tithe of those who were later attacked by small-pox from exposure to this infection were conscious of the place where they were infected. The episode suggests reflections on the facility with which small-pox might be carried to all parts of the country, if an unrecognised case occurred on board a vessel carrying passengers.

IV. *The "Stanley Hospital" Group.*—Within a period of eight days, December 16th to 23rd, there were attacked with small-pox no fewer than seven individuals, who either were at the time inmates of the Stanley Hospital or who had recently returned home from the hospital. Most of these cases (Nos. 179 to 185, and 188) were reported and removed to Parkhill on the 22nd and 23rd. It is clear that they must have been all infected about the same time, probably in the first week of the month. A woman aged 45 (No. 191) was removed from Reading Street on December 27th, having been attacked with small-pox on the 22nd, just a fortnight after the removal of her son, 21 years of age, to Stanley Hospital, where he died within 12 hours from an acute disease certified as "scarlet fever; hæmorrhage." It seems impossible to avoid the conclusion that this young man died from malignant small-pox, but where he contracted it is not known. Other cases traceable to the same source were notified in January. Thus on January 13th, in removing two cases (Nos. 198 and 199) from Elias Street, the inspector learnt that the brother of No. 198 (living at Gordon Street) had recently been in Stanley Hospital, and had visited a friend at Howe Street (No. 197), who had also been notified that day. On proceeding to Gordon Street the inspector found this man (No. 201) and his sister (No. 200) the latter ill about about three days, and removed them both to Parkhill. On January 27th a woman (No. 204) engaged in the same laundry as No. 198 was also removed. (Plate VI.)

Thus 15 cases occurred in this group, nine of them were inmates of Stanley Hospital when the unsuspected fatal case occurred; and five houses were infected, two yielding two cases (one having been in no hospital), three yielding one case (one having been in no hospital).

As every case of small-pox notified to the authorities since the beginning of 1892 has been removed to hospital, the records of that institution enable a complete analysis of the whole outbreak to be made. In Appendix IV. will be found a table giving the essential facts of each case extracted from the hospital register which is kept by Dr. Walker. It will be seen that in nearly every case the day of the illness of the patient is recorded, so that a list may be constructed showing the numbers of cases attacked in each week of the year (v. Table III.). It is further of interest to note that according to these statements there were admitted on—

1st day of attack	1 case.
2nd " "	3 cases.
3rd " "	19 "
4th " "	35 "
5th " "	43 "
6th " "	43 "
7th " "	21 "
8th " "	12 "
9th " "	7 "
10th " "	5 "
11th " "	2 "
13th " "	3 "
14th " "	3 "
16th " "	1 case.
in 3rd week	1 "
" 4th "	1 "
not stated	5 cases.
	205

and one (No. 27) developed the disease after admission.

TABLE III.

Liverpool, 1892-3. *Cases of Small-pox according to Weeks of onset of Illness.*

Week ending— 1892.	Rec.	Died.	Still in Hospital.
January 9	1	1	—
" 16	6	3	3
" 23	7	7	—
" 30	4	4	—
February 6	10	8	2
" 13	3	3	—
" 20	11	10	1
" 27	4	4	—
March 5	5	4	1
" 12	3	3	—
" 19	5	5	—
" 26	2	1	1
April 2	3	3	—
" 9	—	—	—
" 16	2	1	1
" 23	1	1	—
" 30	1	—	1
May 7	1	1	—
" 14	2	2	—
" 21	4	4	—
" 28	5	5	—
June 4	1	1	—
" 11	7	5	2
July 23	1	1	—
" 30	—	—	—

* These cases had not been notified. No medical man had been called in. The householder was prosecuted for not notifying.

LIVERPOOL.

—	—	Rec.	Died.	Still in Hospital.
1892. Week ending—				
August 6	2	2	—	—
* * * * * * * * * * *				
October 8	10	9	1	—
„ 15	5	5	—	—
„ 22	6	6	—	—
„ 29	13	12	—	1
November 5	7	6	—	1
„ 12	6	5	—	1
„ 19	13	10	1	2
„ 26	4	4	—	—
December 3	11	6	—	5
„ 10	9	6	1	2
„ 17	6	4	—	2
„ 24	11	3	—	
„ 31	3	—	1	2
1893. January 7	4	—	—	
„ 14	3	—	—	
„ 21	2	—	—	
„ 28	2	—	—	2
	206	155	16	35

TABLE IV.

Liverpool: Small-pox, 1892-3. Age. Sex. Mortality.*

—	Males.			Females.			Both Sexes.			Total.
	Recovered.	Died.	Still in Hospital.	Recovered.	Died.	Still in Hospital.	Recovered.	Died.	Still in Hospital.	
Under 1 year	—	—	—	—	2	—	—	2	—	2
1— 5	—	1	1	1	2	1	1	3	2	6
5—10	3	1	1	5	—	—	8	1	1	10
10—15	5	—	2	12	2	3	17	2	5	24
15—20	24	—	3	8	2	1	32	2	4	38
20—30	32	—	10	23	—	5	55	—	15	70
30—40	14	3	4		—	—	18	3	4	25
40—50	12	1	1	3	—	1	15	1	2	18
50—60	1	—	—	—	—	—	1	—	—	1
60—70	4	1 (*a*)	2	—	—	—	4	1	2	7
70 and over	2	—	—	—	—	—	2	—	—	2
Age not stated	2	1 (*b*)	—	—	—	—	2	1	—	3
	99	8	24	56	8	11	155	16	35	206
	131			75			206			

* From January 12th, 1892, to January 30th, 1893.

(*a*.) Man, æt. 61, had mild attack of small-pox, and died from bronchitis during convalescence.

(*b*.) Had recovered from small-pox, when attacked with acute laryngitis, and died from œdema glottidis.

It will be seen that of the 18 children under the age of 10 years who were attacked with small-pox, six died, or 33 per cent.; that of those attacked between 10 and 30 years, 132 in number, four died, or 3 per cent.; and those aged 30 years and over, 53, there died five, or 9·4 per cent. The age is not stated in three cases (all adults), of whom one died.

Types of the small-pox attacks.

The next table (V.) contains an analysis of the character of the disease, as stated in Dr. Walker's register. It will be noted that the term "semi-confluent" is employed; and that the vast majority fall under the head of "discrete" cases. The term "modified" has been applied to a few cases in which the eruption was either very scanty or ill developed; and that of "inoculated" where the history of the case, as well as the character of the attack, suggested this mode of infection. One may perhaps, without over-estimating the actual facts, group these divisions under the three heads of "mild," "severe," and "fatal," including under the first head all those enumerated as discrete cases, except the fatal cases. This division may not be quite accurate, since, if we may judge from the time during which some of this class remained in the hospital, they merit to be considered as "severe" as those entitled "semi-confluent."

—	Mild.	Severe.	Fatal.	Total.
Under 1 year	—	—	2	2
1 to 10 years	8	4	4	16
10 to 30 „	106	22	4	132
30 years and over	40	8	5 (*a*)	53
Age not stated	2	—	1 (*b*)	3
	156	34	16	206

(*a*.) } See previous footnotes to Table IV.
(*b*.) }

TABLE V.

Liverpool: Small-pox Cases, 1892-93. Type of Attack.

—	Confluent.			Semi-confluent.			Discrete.			"Modified."			"Inoculated."			Total.			—
	Recovered.	Died.	Remaining in Hospital.	Recovered.	Died.	Remaining in Hospital.	Recovered.	Died.	Remaining in Hospital.	Recovered.	Died.	Remaining in Hospital.	Recovered.	Died.	Remaining in Hospital.	Recovered.	Died.	Remaining in Hospital.	
Under 1 year - -	—	—	—	—	—	—	—	2	—	—	—	—	—	—	—	—	2	—	2
1 to 5 years - -	—	—	—	—	3	1	1	—	1	—	—	—	—	—	—	1	3	2	6
5 to 10 „ - -	1	—	1	1	—	—	6	1	—	—	—	—	—	—	—	8	1	1	10
10 to 15 „ - -	—	1	—	1	—	2	15	1	3	1	—	—	—	—	—	17	2	5	24
15 to 20 „ - -	3	1	—	4	—	—	22	1	4	2	—	—	1	—	—	32	2	4	38
20 to 30 „ - -	3	—	6	5	—	1	44	—	7	2	—	—	1	—	1	55	—	15	70
30 to 40 „ - -	1	3	3	2	—	—	15	—	1	—	—	—	—	—	—	18	3	4	25
40 to 50 „ - -	—	1	—	1	—	—	12	—	2	1	—	—	1	—	—	15	1	2	18
50 to 60 „ - -	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	1	—	—	1
60 to 70 „ - -	—	—	—	—	—	1	2	1(a)	1	2	—	—	—	—	—	4	1	2	7
70 and over - -	—	—	—	—	—	—	2	—	—	—	—	—	—	—	—	2	—	—	2
Age not stated - -	—	—	—	—	1(b)	—	2	—	—	—	—	—	—	—	—	2	1	—	3
	8	6	10	14	4	5	122	6	19	8	—	—	3	—	1	155	16	35	206

(a.) } *See* note to Table IV.
(b.) }

As regards the vaccination relations of these patients it will be seen from the annexed table (Table VI.) that 177 are reported to have been vaccinated, in three there was a doubt as to vaccination, in two it was stated that they had been vaccinated, but no marks were visible, five were undergoing primary vaccination when attacked by small-pox, and 19 were unvaccinated. Of the cases which had been discharged from the hospital at the time of my visit, 171 in number, there had been 16 deaths, a mortality of 9·4 per cent., or, excluding two cases from affections contracted during convalescence from small-pox, 8·2 per cent. Dealing with the latter number (14), only the deaths are distributed as follow:—

—	Cases.	Deaths.	Per cent.
Vaccinated - - -	145	4	2·7
Vaccination doubtful - -	3	2	66
Alleged vaccination - -	2	—	—
"Under" vaccination - -	4	1	25
Unvaccinated - - -	15	7	16·6

Analysing the series of "vaccinated" according to the record of the condition of the cicatrices, which are given in the register under the heads of "good," "fair," and "faint," or "bad" we find that:—

Of 102 patients having "good" marks, 86 recovered, and 16 were under treatment on January 30th.

Of 35 having "fair" marks, 25 had recovered, and 10 remained under treatment.

Of 37 with "faint" or "bad" marks, 27 had recovered, six had died (or four if the two cases previously referred to be excluded), and four remained under treatment. Lastly, in three cases which recovered the condition of the marks is not stated. Too much stress must not be placed on this analysis, since what constitutes a "good" or a "bad" cicatrix depends much on the standard adopted by the observer. It should further be said that in nine instances the marks are of more than one category, and their relegation by me under one head only has been somewhat arbitrary. Nevertheless this does not affect the most important deduction from these figures, few as they are, namely, that each of the fatal vaccinated cases falls under the series of those having "faint" or "bad" marks.

In the Appendix VI. will be found an analysis of the vaccination conditions in reference to the character of the attack. This is summarised in the following table, and the age-incidence is also included (Table VII.).

LIVERPOOL.

TABLE VI.

Liverpool: Small-pox Cases, 1892-3.—Vaccination Statistics.

Age.	Vaccinated.			Vaccination doubtful.			Vaccination alleged, but no Evidence.			"Under" Vaccination.			Unvaccinated.			Total.			—	Re-vaccinated.
	Recovered.	Died.	Remaining in Hospital.	Recovered.	Died.	Remaining in Hospital.	Recovered.	Died.	Remaining in Hospital.	Recovered.	Died.	Remaining in Hospital.	Recovered.	Died.	Remaining in Hospital.	Recovered.	Died.	Remaining in Hospital.		
Under 1 year	—	—	—	—	—	—	—	—	—	—	1	—	—	1	—	—		—	2	
1 to 5 years	—	—	—	—	—	—	—	—	—	—	—	—	1	3	2	1	3	2	6	
5 to 10 „	4	1	—	—	—	—	—	—	—	2	—	—	2	—	1	8	1	1	10	
10 to 15 „	17	1	4	—	—	—	—	—	—	—	—	—	—	1	1	17	2	5	24	
15 to 20 „	28	—	4	—	1	—	—	—	—	—	—	—	4	1	—	32	2	4	38	5 (Nos. 57, 79, 157, 158, 168).
20 to 30 „	53	—	15	—	—	—	—	—	—	1	—	—	1	—	—	5	—	15	70	3 (Nos. 35, 36, 75).
30 to 40 „	17	1	3	—	1	—	1	—	—	—	—	1	—	1	—	18	3	4	25	3 (Nos. 137, 156, 166).
40 to 50 „	14	1	2	1	—	—	—	—	—	—	—	—	—	—	—	15	1	2	18	5 (Nos. 27, 76, 119, 126, 160).
50 to 60 „	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	1	
60 to 70 „	3	1	2	—	—	—	1	—	—	—	—	—	—	—	—	4	1	2	7	1 (No. 139).
70 and over	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	—	—	2	1 (No. 143).
Age not stated	2	1	—	—	—	—	—	—	—	—	—	—	—	—	—	2	1	—	3	
Total	141	6	30	1	2	—	2	—	—	3	1	1	8	7	4	155	16	35	206	

TABLE VII.

Cases of Small-pox.—Type and Vaccination.

—	Type.	Below 1 Year.	1 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 and over.	Age not stated.	Total.
Vaccinated	Confluent	—	—	—	—	1	9	4	1	—	—	—	—	15
	Semi-confluent	—	—	—	3	3	6	1	1	—	1	—	1	16
	Discrete	—	—	5	18	25	49	16	13	1	3	2	2	134
	"Modified"	—	—	—	1	2	2	—	1	—	2	—	—	8
	"Inoculated"	—	—	—	—	1	2	—	1	—	—	—	—	4
	Total	—	—	5	22	32	68	21	17	1	6	2	3	177
Vaccination doubtful	Confluent	—	—	—	—	—	—	1	—	—	—	—	—	1
	Semi-confluent	—	—	—	—	—	—	—	—	—	—	—	—	—
	Discrete	—	—	—	—	1	—	—	1	—	—	—	—	2
	Total	—	—	—	—	1	—	1	1	—	—	—	—	3

Table VII.—*continued.*

—	Type.	Below 1 Year.	1 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 and over.	Age not stated.	Total.
Alleged vaccination; but no marks	Confluent	—	—	—	—	—	—	—	—	—	—	—	—	—
	Semi-confluent	—	—	—	—	—	—	1	—	—	—	—	—	1
	Discrete	—	—	—	—	—	—	—	—	—	1	—	—	1
	Total	—	—	—	—	—	—	1	—	—	1	—	—	2
"Under" vaccination	Confluent	—	—	—	—	—	—	1	—	—	—	—	—	1
	Semi-confluent	—	—	1	—	—	—	—	—	—	—	—	—	1
	Discrete	1	—	1	—	—	1	—	—	—	—	—	—	3
	Total	1	—	2	—	—	1	1	—	—	—	—	—	5
Unvaccinated	Confluent	—	—	2	1	3	—	1	—	—	—	—	—	7
	Semi-confluent	—	4	—	—	1	—	—	—	—	—	—	—	5
	Discrete	1	2	1	1	1	1	—	—	—	—	—	—	7
	Total	1	6	3	2	5	1	1	—	—	—	—	—	19
	TOTAL	2	6	10	24	38	79	25	18	1	7	2	3	205

Re-vaccination and Small-pox.—It will be seen from Table VI. that 18 of the patients admitted into Parkhill had been re-vaccinated. Two of these (Nos. 126, 75) had been re-vaccinated 20 and 10 years ago respectively. They both had discrete attacks. Two were re-vaccinated at Brownhill Workhouse before admission to Parkhill (Nos. 35, 36); discrete attacks. Seven were inmates of the Belmont Road Test House when re-vaccinated, three successfully (Nos. 156, 157, 158), four unsuccessfully (Nos. 143, 160, 166, 168). One of these had a confluent attack (No. 156), one a "modified" attack (No. 160), the rest discrete. One other case from the Test House was re-vaccinated on admission into Parkhill (No. 159); his attack is stated to have been a "modified" one. Two cases from the s.s "Toronto" had been re-vaccinated unsuccessfully (Nos. 76, 79), both discrete attacks. A female admitted to Parkhill (No. 27) with her infant was re-vaccinated on admission, and was probably incubating small-pox at the time; she was thought to have been inoculated by her child. A wardmaid at Parkhill contracted small-pox after re-vaccination (No. 57), also thought to have been inoculated. Lastly, two patients are said to have been unsuccessfully re-vaccinated (twice) after admission (Nos. 119, 137), one had discrete and the other "modified" small-pox.

There is no provision in Liverpool for harbouring the inmates of infected houses during the fortnight elapsing from the date of removal of a case of small-pox to the hospital. But occasionally it has been found advisable to "quarantine" one or two persons who have been in intimate contact with the patient, and for that purpose the detached pavilion in the grounds at Parkhill, which, at the most can only accommodate 10 persons, has been utilised. Or cases in which there is doubt have been placed here. All so entering Parkhill are re-vaccinated on their admission.

As stated previously, a strict surveillance is kept by the inspectors on all infected houses, and lodging houses during the fortnight, and schools and workshops are informed of the outbreak of disease in the households of children attending school, or of workers engaged at the establishment.

Respecting the provision for re-vaccination and the extent to which the public have availed themselves of it, I may quote from letters received from the clerks to the Boards of Guardians. Mr. Hagger, clerk to the Select Vestry, parish of Liverpool writes:—

"The only steps taken by us during the recent outbreak beyond our ordinary precautions, were to placard the parish calling attention to the importance of vaccination &c., and having the regular stations open on one evening in each week for the convenience of those desirous to be re-vaccinated. This latter arrangement was kept up during the months of December, but as one person only attended to ask for re-vaccination it was not persisted in."

Mr. Moulding, clerk to the Toxteth Park board of guardians, writes:—

"The special steps taken by the guardians have been to open the vaccination stations in an evening, and they have invited re-vaccination by placard and advertisement. They have ordered that all fit adults in the workhouse, and, with the consent of the managers, all the children in Industrial and Charitable Schools, to be re-vaccinated. Very few have offered themselves for re-vaccination at the stations."

Mr. J. A. Ellison, vaccination officer to the West Derby Union, writes:—

"In view of the presence of small-pox, 18 assistants were engaged on the 28th November to make a house to house visitation throughout the Union. This was completed on the 6th ult., and owing to the absence of my colleagues I cannot give you the results. In my district, 24,716 houses were visited, and 417 children between six months and 14 years were found unvaccinated. For the most part these were born outside this Union. One of our public vaccinators let it be known that he would re-vaccinate free of charge any persons at his own house, but he had not a single case. There have been practically no re-vaccinations performed, except upon the inmates of some of our public institutions."

Conclusions.

1. The sanitary organisation of Liverpool is excellent, and the various methods in force for coping with epidemic disease are well planned.

2. There is prompt action taken after notification in the removal of infected persons to hospital, and in the disinfection of clothing and houses. In no case has there been any case traceable to neglect of these precautions.

3. The main reasons for the spread of small-pox in the present epidemic have been, firstly, in the occurrence of cases the true nature of which was overlooked in the first instance—and in the class of persons infected being amongst those who frequent common lodging houses and inhabit crowded districts.

4. It is open to question whether some of the groups of cases might have been more limited in their numbers had there existed a system of isolation of members of infected households.

5. Primary vaccination is performed on the great majority of the inhabitants, but the facilities for free re-vaccination have not been taken advantage of to any great extent. It is not possible to arrive at any conclusion as to the amount of imperfect vaccinations, but there can be no doubt that in a large community like that of Liverpool many of the vaccinations not done by the public vaccinators fall under this category.

I desire to thank Dr. Stopford Tayler, Dr. Hope, Dr. Walker, and other gentlemen for all the assistance they have kindly rendered me in this inquiry.

London, February 21st, 1893. S. C.

LIVERPOOL.

LIST OF APPENDICES.

I. *Form of Order for House Disinfection.*
II. *Returns of Vaccination.*
III. *Statistical Analysis of Cases of Small-pox in respect to Vaccination.* (*Dr. E. W. Hope.*)
IV. *Return of Cases treated at Parkhill Hospital from January 1st, 1892, to February 6th, 1893.* (*Dr. Walker.*)
V. *Table of Cases of Small-pox admitted into Parkhill Hospital from January 12th, 1892, to January 30th, 1893.*
VI. *Analysis of Cases of Small-pox with regard to the Type of the Disease and the Character of Vaccination.*
VII. *List of Fatal Cases of Small-pox.*
VIII. *Liverpool Union :—Vaccination Returns, 1872–1892.*

APPENDIX I.

FORM OF ORDER FOR DISINFECTION OF HOUSE.

Infectious or Contagious Disease.

CITY OF LIVERPOOL.

WHEREAS, by "The Ninth and Tenth of Victoria, chapter one hundred and twenty-seven, Liverpool Sanitary Act, 1846," it is enacted, That when it shall appear to the Town Council or Health Committee of the said Borough, either from the Report of the Officer of Health for the said Borough or otherwise, that the whitewashing, cleansing, or purifying of any house or of any part thereof, would tend to prevent or check infectious or contagious disease, which may have occurred therein, it shall be lawful for the said Council or Health Committee from time to time, if they shall think it expedient, to order the Owner or Occupier of such house or dwelling, or part thereof, within the said Borough, to whitewash, cleanse, and purify the same, in such manner and within such time as the said Council or Health Committee may deem reasonable; and if such Owner or Occupier shall not comply with such order, he shall forfeit and pay any sum not exceeding ten shillings for every day's neglect thereof; and it shall be lawful for the said Council or Health Committee to cause such house or dwelling or part thereof, to be whitewashed, cleansed, and purified, and to recover the expenses thereof from such Owner or Occupier.

AND WHEREAS it appeareth to the Health Committee of the said City in manner required by the said Act, that the whitewashing, cleansing, and purifying of the house No. Street, would tend to check or prevent infectious disease which has occurred therein.

The following work will require to be done, viz.:—

TO STRIP AND THOROUGHLY CLEANSE

The infected paper stripped from the walls must be burnt in the grates in the room, or by other effectual means, so as to avoid exposure

Now you No.
being the Owner of the said house are hereby ordered and required by the said Health Committee to whitewash, cleanse, and purify the said house
to the satisfaction of the said Committee, within forty-eight hours from the service of this order, and you are further required to take notice, that in default of your so doing, you will become liable to forfeit and pay any Inspec sum not exceeding ten shillings for every day's neglect to comply with such order, and that proceedings will be taken against you to recover the same.

Dated this day of
one thousand eight hundred and ninety-two.

By order of the Health Committee
of the Council of the City of Liverpool.
GEORGE. J. ATKINSON,
Town Clerk.

To Mr. _____

NOTE.—All inquiries respecting the above order to be made at the Sanitary Department, Municipal Offices, Dale Street, Liverpool, between the hours of Nine and half-past Nine a.m.

N.B.—If the Occupier offers any opposition to the execution of the Order, or if there be any sick person in the house not sufficiently recovered to allow of the work being done, or if any other difficulty shall arise in the matter, the person to whom the above Order is addressed should, without the least delay, communicate with the Inspector of Nuisances, who will give such information, and render such assistance as may be necessary, otherwise the terms of the above Order will be strictly enforced.

READY FOR CLEANING.

APPENDIX II.

RETURNS OF VACCINATION.

RETURN FOR 1892.

RETURN made by Mr. JOHN MCKENNA, Vaccination Officer of No. 1 District of the West Derby Union, respecting the Vaccination of Children whose Births were registered in his District, from 1st January to 30th December 1892, inclusive.

Registration Sub-Districts comprised in the Vaccination Officer's District.	Number of Births returned in the "Birth List Sheets" as registered from 1st January to 30th June 1892.	Number of these Births duly entered by in Columns 10, 11, and 13 of the "Vaccination Register" (Birth List Sheets), viz.:—					Number of these Births which remained unentered in the "Vaccination Register" on account (as shown by Report Book) of			Number of these Births remaining on neither duly entered in the "Vaccination Register" (Columns 3, 4, 5, and 6 of this Return) nor temporarily accounted for in the "Report Book" (Columns 8, 9, and 10 of this Return).
		Column 10. "Successfully Vaccinated."	Column 11. "Insusceptible of Vaccination."	Column 11. "Had Small-pox."	Column 13. "Dead, unvaccinated."	[This Column to be left blank.]	Postponement by Medical Certificate.	Removal to Districts the Vaccination Officer of which has been duly apprised.	Removal to Places unknown, or which cannot be reached; and Cases not having been found.	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
First six months.										
1. Everton, South -	1,015	818	1	—	124		15	1	52	4
2. Everton, North -	996	844	3	—	89		13	2	41	4
3. Kirkdale - -	1,190	957	7	—	107		24	—	89	6
Total - - -	3,201	2,619	11	—	320		52	3	182	14
Second six months.										
4. Everton, South -	1,045	768	3	—	114		42	—	42	76
5. Everton, North -	1,024	735	—	—	111		51	—	51	96
6. Kirkdale - -	1,165	858	1	—	95		59	—	59	93
Total - - -	3,234	2,361	4	—	320		152	—	152	265
TOTAL - -	6,435	4,980	15	—	640		204	3	334	279

Dated 17th February 1893.

(Signed) JOHN MCKENNA,
Vaccination Officer.

RETURN FOR 1892.

RETURN made by Mr. J. ELLISON, Vaccination Officer of No. 2 District of the West Derby Union, respecting the Vaccination of Children whose Births were registered in his District, from 1st January to 31st December 1892, inclusive.

Registration Sub-Districts comprised in the Vaccination Officer's District.	Number of Births returned in the "Birth List Sheets" as registered from 1st January to 30th December 1892.	Number of these Births duly entered by in Columns 10, 11, and 13 of the "Vaccination Register" (Birth List Sheets), viz.:—					Number of these Births which remained unentered in the "Vaccination Register" on account (as shown by Report Book) of			Number of these Births remaining on neither duly entered in the "Vaccination Register" (Columns 3, 4, 5, and 6 of this Return) nor temporarily accounted for in the "Report Book" (Columns 8, 9, and 10 of this Return).
		Column 10. "Successfully Vaccinated."	Column 11. "Insusceptible of Vaccination."	Column 11. "Had Small-pox."	Column 13. "Dead, unvaccinated."	[This Column to be left blank.]	Postponement by Medical Certificate.	Removal to Districts the Vaccination Officer of which has been duly apprised.	Removal to Places unknown, or which cannot be reached; and Cases not having been found.	
1.	2.		4.	5.	6.	7.	8.	9.	10.	11.
First six months.										
West Derby, Municipal	1,419	1,191	9	—	122		24	11	47	15
West Derby, Rural -	561	470	3	—	55		10	4	11	8
Wavertree - - -	479	427	1	—	40		3	3	5	—
Total - - -	2,459	2,088	13	—	217		37	18	63	23
Second six months.										
West Derby, Municipal	1,421	1,033	5	—	128		66	10	39	140
*West Derby, Rural -	520	394	2	—	29		13	2	8	72*
Wavertree - - -	472	384	2	—	30		35	—	9	13
Total - - -	2,414	1,811	9	—	187		114	12	56	225
TOTAL - -	4,873	3,899	22	—	404		151	30	119	248

* Public vaccination for part of this district is quarterly, not weekly.

Dated 17th February 1893.

(Signed) JOHN A. ELLISON,
Vaccination Officer.

LIVERPOOL.

RETURN FOR 1892.

RETURN made by MR. MORROW, Vaccination Officer of No. 3 District of the West Derby Union, respecting the Vaccination of Children whose Births were registered in his District, from 1st January to 30th June 1892, inclusive.

1892. Registration Sub-Districts comprised in the Vaccination Officer's District.	Number of Births returned in the "Birth List Sheets" as registered from 1st January to 30th June 1892.	Number of these Births duly entered by 31st January 1893, in Columns 10, 11, and 13 of the "Vaccination Register" (Birth List Sheets), viz. :—					Number of these Births which on 31st January 1893 remained unentered in the "Vaccination Register" on account (as shown by Report Book) of			Number of these Births remaining on 31st January 1893, neither duly entered in the "Vaccination Register" (Columns 3, 4, 5, and 6 of this Return) nor temporarily accounted for in the "Report Book" (Columns 8, 9, and 10 of this Return).
		Column 10. "Successfully Vaccinated."	Column 11. "Insusceptible of Vaccination."	Column 11. "Had Small-pox."	Column 13. "Dead, unvaccinated."	[This Column to be left blank.]	Postponement by Medical Certificate.	Removal to Districts the Vaccination Officer of which has been duly apprised.	Removal to Places unknown, or which cannot be reached; and Cases not having been found.	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
First six months.										
1. Walton - -	1,583	1,340	7	—	127		25		67	17
2. Litherland - -	261	214	—	—	17		3		16	11
3. Great Crosby -	133	137	—	—	6		4		4	2
Total - - -	1,997	1,691	7	—	150		32		87	30
Second six months.										
4. Walton - -	1,688	1,242	1	—	135		62		33	215
5. Litherland - -	284	169	—	—	20		11		3	81*
6. Great Crosby -	159	102	—	—	7		11		1	38*
Total - - -	2,131	1,513	1	—	162		84		37	334
TOTAL - -	4,128	3,204	8	—	312		116		124	364

Dated _____ (*Signed*) ROBERT MORROW,
Vaccination Officer.

* There are periodical Districts vaccinating every three months only.

From Liverpool "Courier," 10th February 1893.

Mr. J. Moulding, the clerk, as vaccination officer of the township of Toxteth, presented a supplemental return for the year 1891, from which it appeared that there were 4,278 births registered during the year. Of these children, 3,065 were successfully vaccinated, 15 were insusceptible of vaccination, 532 died unvaccinated, 150 were postponed by medical certificate, and 515 were removed to places unknown. During the half year ending June last there were 2,067 births. Of these children 1,444 were successfully vaccinated, 6 were insusceptible of vaccination, 208 died unvaccinated, 167 were postponed by medical certificate, 5 were removed to other districts, and 230 to places unknown.

In submitting these returns Mr. Moulding said that he regretted to have to state that, notwithstanding greater assiduity on the part of the Board's officers, increased pressure on the public to take advantage of the vaccination laws, and the warning which lies in the fact that small-pox prevails largely in neighbouring towns, they were not quite as satisfactory as those that had preceded them for corresponding periods. The causes did not lie on the surface. Something might be attributed to the weihgt of personal influence in high quarters, and to leaflets strewn broadcast inveighing against vaccination and calling it nasty names. Something, too, may be put down to a small per-centage of disasters from vaccination that had been made the most of, and perhaps a good deal to the absence of any report from the Royal Commission on Vaccination, which seemed to justify the inference that there must be a good deal to be said against it, and which, he feared, had impaired the public faith in its efficacy. In the absence of this report, which, when it came, might or might not set the question at rest, they were driven back on their own speculations whether the operation was the specific it claimed to be. They should not forget that two generations have passed away since the scourge of small-pox claimed thousands as its victims; some escaping with their lives were left without sight, and others, who escaped with both, were so disfigured as to pass the remainder of their lives objects of compassion. It was a rare thing now to find a person even pitted. The reply to this might be the removal of causation in improved sanitation and habits of the people. These could not be discarded as doubtful forces, but after all there remained an overwhelming mass of evidence that vaccination had most to do with it.

WEST DERBY UNION.

VACCINATION SUPPLEMENTAL RETURN, made 8th February 1893 for 1891.

Districts.	Births.	Vaccinated.	Dead.	Insusceptible.	Removed to other Districts.	Postponed.	Not known.	Blank.
No. 1 District - - - - -	6,462	5,333	718	10	22	75	296	8
No. 2 District - - - - -	4,634	3,953	463	13	42	44	121	18
No. 3 District - - - - -	4,205	3,548	442	4	2	33	173	3
Totals - - -	15,321	12,834	1,623	27	66	152	590	29

APPENDIX III.

ANALYSIS OF CASES OF SMALL-POX.—(DR. HOPE.)

Table showing Age, Condition in regard to Vaccination, and Nature of Illness in 840 Cases of Small-pox.

Age.	Number and Character of Cicatrices. Good. 1.	2.	3.	4 or more.	Indifferent. 1.	2.	3.	4 or more.	Re-vaccinated.	Vaccination doubtful.	Not vaccinated.
Under one year.			1 M.			1 S.					4 S. 6 F.
One year and under 10.	2 M. 1 S.	5 M. 2 S.	7 M.	11 M. 5 S.	7 M. 6 S.	5 M. 2 S.	10 M. 5 S.	5 M.		7 S.	45 S. 23 F.
10 years and under 20.	6 M. 9 S.	22 M. 5 S. 1 F.	39 M. 6 S. 1 F.	32 M. 8 S.	5 M. 17 S.	17 S. 13 S.	21 M. 16 S.	28 M. 14 S. 2 F.	3 M.*	3 M. 9 S. 3 F.	17 S. 15 F.
20 years and under 40.	17 M. 4 S. 1 F.	21 M. 21 S. 1 F.	9 M. 9 S.	4 M.	14 M. 27 S. 5 F.	22 M. 39 S. 4 F.	16 M. 16 S. 2 F.	10 M. 1 S.	2 M.*	1 M. 5 S. 5 F.	10 S. 15 F.
Over 40 years.	2 M. 5 S.	3 M. 3 S.	1 F.		5 M. 10 S. 6 F.	3 M. 9 S. 2 F	1 M. 1 S.	6 M. 1 S.		1 M. 2 S. 2 F.	2 S.

M.=mild. S.=severe. F.=fatal. * Said to have been re-vaccinated.

	Total.	Died.	Mortality.
Vaccinated { Having one or more good scars - -	284	5	1·7 per cent.
Vaccinated { Having indifferent scars - - -	374	21	5·6 „
Vaccination doubtful (No scar visible.) - - - - -	38	10	26·3 „
Not vaccinated - - - - - -	139	61	43·9 „

LIVERPOOL.

APPENDIX IV.

RETURN of Cases admitted into the City Hospital, Parkhill, from January 1st, 1892, to February 6th, 1893 (Dr. Walker).

Diseases.	Patients in Hospital on December 31st, 1891.	Admitted from January 1st, 1892, to February 6th, 1893.			Patients in Hospital on February 6th, 1893.	Total under Treatment from January 1st, 1892, to February 6th, 1893.	Number of Patients in Hospital on December 31st, 1892.	Deaths and Mortality per Cent. on Convalescents.		Deaths and Mortality per Cent. on Acute Cases.		
		Acute Cases.	Convalescents.									
			From Grafton Street.	From Netherfield Road.								
Scarlet fever	32	4	96	61	0	193	0	0	0	0	0	
Small-pox	1	210	—	—	—	211	50	—	—	14	6·60	
Measles	12	6	—	—	0	18	3	—	—	0	0	
Typhoid	1	—	—	—	0	1	0	—	—	1	100	
Chicken-po	—	11	—	—	2	11	0	—	—	1	9·090	
Cholera	—	4	—	—	0	4	0	—	—	2	50	
Other diseases	—	17	—	—	0	17	0	—	—	2	11·76	These were two convalescent cases of small-pox, one died of œdema glottis, the other of pneumonia.
Total	—	—	96	61	—	465	53	—	—	20	4·301	

APPENDIX V.

TABLE of Cases of Small-pox admitted into the City Hospital, Parkhill, from January 12th, 1892, to January 30th, 1893.

[Compiled from the Register kept by Dr. Walker, Resident Physician, Parkhill.]

No.	Name.	Sex.	Age.	Date of Admission.	Day of Attack.	Type of Small-pox.	Result.	Day of Discharge.	Vaccination Marks.	Re-vaccination.	No. of Days in Hospital.	Remarks.
1	T. H.	M.	25	Jan. 12	9th	Discrete	R.	Mar. 17	2 good	—	66	
2	S. W.	F.	25	„ 18	1st	„	R.	Feb. 19	1 faint	—	33	
3	T. W.	M.	5	„ 18	6th	Hæmorrhagic	D.	Jan. 20	3 faint	—	3	
4	M. W.	F.	1	„ 18	7th	Discrete	R.	Feb. 19	*Unvaccinated*	—	33	
5	E. P.	F.	17	„ 19	10th	Confluent	D.	Jan. 22	„	—	4	
6	T. P.	M.	20	„ 20	4th	Discrete	R.	Feb. 20	4 very faint	—	32	
7	G. H.	F.	17	„ 21	(?)	„	D.	Jan. 21	(?)	—	1	
8	M.K.	F.	9	„ 23	4th	Semi-confluent	R.	Mar. 17	18. Jan. 1893	—	55	As result of vaccination no vesicle found, only papule.
9	R. McL.	M.	16	„ 25	3rd	Discrete	R.	Apr. 14	*Unvaccinated*	—	81	Albuminuria.
10	A. B.	M.	22	„ 25	5th	„	R.	Mar. 3	Fairly good	—	39	
11	R. M.	F.	33	„ 27	8th	Semi-confluent	R.	May 5	1 very faint	—	100	Abscesses. Bronchitis.
12	T. M.	M.	46	„ 28	6th	Discrete	R.	Mar. 3	1 fair	—	36	
13	C. H.	F.	26	„ 29	7th	„	R.	Feb. 26	2 large, bad	—	29	
14	S. H.	F.	21	„ 29	7th	„	R.	„ 19	3 good	—	22	
15	M. C.	F.	26	„ 29	2nd	Semi-confluent	R.	Mar. 31	2 good	—	63	
16	M. W.	F.	14	Feb. 2	7th	Discrete	R.	„ 17	2 good	—	45	

No.	Name.	Sex.	Age.	Date of Admission.	Day of Attack.	Type of Small-pox.	Result.	Day of Discharge.	Vaccination Marks.	Re-vaccination.	No. of Days in Hospital.	Remarks.
17	J. M.	M.	19	Feb. 3	6th	Semi-confluent	R.	Mar. 31	2 very faint	—	58	Axillary abscess.
18	S. P.	F.	14	„ 4	4th	Discrete	R.	„ 3	2 fair	—	29	
19	M. R.	F.	40	„ 4	8th	Semi-confluent	R.	Apr. 16	2 faint	—	73	
20	J. G.	M.	17	„ 5	5th	Confluent	R.	„ 23	*Unvaccinated*	—	79	
21	J. O'B.	M.	26	„ 9	7th	Discrete	R.	Mar. 31	3 good	—	52	
22	M. B.	F.	10	„ 9	7th	Hæmorrhagic	D.	Feb. 14	*Unvaccinated*	—	5	
23	E. H.	F.	16	„ 9	6th	Discrete	R.	Mar. 24	2 fair	—	45	
24	M. E. H.	F.	16	„ 10	6th	Semi-confluent	R.	Apr. 9	*Unvaccinated*	—	60	
25	J. B.	M.	29	„ 10	5th	Discrete	R.	Mar. 10	3 faint	—	30	
26	E. M.	F.	1 5/12	„ 10	6th	Semi-confluent	D.	Feb. 24	*Unvaccinated*	—	15	Hyperpyrexia.
27	M. M.	F.	40	„ 10	—	Inoculated	R.	Mar. 3	2 good	10 Feb. 1892.	23	Not suffering from small-pox at time of admission with her infant (No. 26).
28	E. A.	M.	31	„ 11	7th	Discrete	R.	Apr. 2	2 faint	—	52	Albuminuria.
29	Mrs. G.	F.	33	„ 11	6th	„	R.	May 19	2 good	—	90	
30	A. W.	M.	16	„ 16	8th	„	R.	Mar. 10	2 fair	—	24	
31	J. W.	M.	19	„ 16	4th	„	R.	May 21	3 good	—	96	
32	J. M	M.	21	„ 20	5th	„	R.	Mar. 17	3 good	—	27	
33	C. M.	F.	12	„ 20	7th	„	R.	„ 11	3 bad	—	21	
34	M. M.	F.	21	„ 20	5th	„	R.	May 5	4 fair	—	76	
35	W. P.	M.	27	„ 21	5th	„	R.	Mar. 17	Bad	Yes	26	
36	C. S.	M.	20	„ 21	5th	„	R.	April 6	1 good	„	46	
37	A. D.	F.	24	„ 22	5th	„	R.	Mar. 24	3 good	—	32	
38	J. A. K.	F.	12	„ 22	5th	„	R.	„ 17	Marks?	—	25	
39	M. M.	F.	11	„ 22	4th	„	R.	„ 11	2 good	—	19	
40	J. B.	M.	24	„ 22	6th	„	R.	April 23	2 recent	—	62	"Under" vaccination.
41	S. M.	F.	17	„ 23	5th	"Modified"	R.	Mar. 24	4 good	—	31	
42	A. V.	F.	13	„ 24	6th	Discrete	D.	„ 6	2 bad	—	12	Septicæmia Hyperpyrexia.
43	E. S.	F.	24	„ 25	5th	„	R.	„ 31	2 good	—	36	
44	R. O.	M.	27	„ 26	5th	Semi-confluent	R.	May 25	1 faint	—	110	
45	T. B.	M.	11	„ 27	6th	"Modified"	R.	Mar. 24	1 good	—	27	
46	P. C. W.	M.	24	„ 27	4th	„	R.	„ 10	2 good	—	13	Variola 20 years ago.
47	S. E. W.	F.	2½	Mar. 3	5th	Semi-confluent	D.	„ 7	*Unvaccinated*	—	5	
48	M. M.	M.	17	„ 5	7th	"Modified"	R.	„ 31	2 good	—	27	
49	E. M.	M.	25	„ 5	6th	Discrete (?)	R.	April 11	*Unvaccinated*	—	38	No marks. Two attempts at vaccination failed. Case very mild. ? Small-pox infancy.
50	T. S.	M.	39	„ 12	9th	„	R.	„ 14	2 fair	—	34	
51	E. McL.	F.	22	„ 16	6th	Semi-confluent	R.	June 4	1 bad	—	81	
52	J. M.	M.	16	„ 18	6th	„	R.	„ 11	3 fair	—	86	
53	R. B. B.	M.	18	„ 18	8th	Discrete	R.	April 14	3 good	—	28	
54	W. H. B.	M.	20	„ 18	14th	„	R.	„ 6	2 faint, 1 fair	—	20	
55	A. J. B.	F.	15	„ 18	8th	„	R.	May 6	4 good	—	50	
56	E. M.	F.	18	„ 18	6th	„	R.	April 14	4 good	—	28	
57	E. T.	F.	18	„ 18	4th	"Inoculated"	R.	„ 6	3 good	Yes	18	A wardmaid at Park-hill.
58	P. M.	M.	38	„ 21	5th	Semi-confluent	R.	May 28	0 marks	—	69	Stated to have been vaccinated.
59	W. T.	M.	43	„ 21	6th	Discrete	R.	April 6	1 good	—	17	
60	A. V.	F.	10	„ 25	3rd	Semi-confluent	R.	June 11	1 bad, 1 fair	—	79	
61	J. S.	M.	?	„ 30	6th	„	D.	May 1	1 fair, 2 faint	—	33	Died from acute œdema of glottis when convalescent from small-pox.
62	G. A.	M.	?	April 4	5th	Discrete	R.	„ 12	2 good	—	39	
63	C. L.	M.	36	„ 5	5th	„	R.	„ 12	2 good	—	38	
64	G. S.	M.	19	„ 6	5th	„	R.	„ 12	1 good 1 fair 1 faint	—	37	
65	T. W.	M.	11	„ 16	6th	„	R.	„ 19	3 good	—	34	
66	W. T.	M.	33	„ 22	11th	Confluent	D.	April 25	*Unvaccinated*	—	4	
67	M. T.	F.	½	„ 28	4th	Discrete	D.	May 10	„	—	13	Attempt at vaccination 23rd; failed.
68	L. D.	M.	29	May 2	13th	„	R.	June 3	2 good	—	33	
69	P. G.	F.	37	„ 6	4th	Confluent	R.	July 6	2 good, 1 faint	—	62	
70	H. S.	M.	19	„ 12	4th	Discrete	R.	June 25	3 fair	—	45	

LIVERPOOL.

No.	Name.	Sex	Age.	Date of Admission.	Day of Attack.	Type of Small-pox.	Result.	Day of Discharge.	Vaccination Marks.	Re-vaccination.	No. of Days in Hospital.	Remarks.
71	S. C.	F.	26	May 14	5th	Discrete	R.	July 15	3 fair	—	63	
72	D. L.R.	F.	15	„ 27	5th	„	R.	June 25	4 faint	—	30	
73	A. K. B.	M.	28	„ 30	4th	„	R.	July 7	2 good	—	39	
74	A. O'N.	F.	23	„ 30	16th	Semi-confluent	R.	June 27	4 fair	—	29	
75	G. M.	M.	23	„ 31	13th	Discrete	R.	„ 18	4 good	10 years ago.	19	From ss. "Toronto."
76	R. S.	M.	43	„ 31	13th	„	R.	July 2	2 fair	Unsuccessful.	33	Ditto.
77	J. H. J.	M.	18	„ 31	14th	Semi-confluent	R.	„ 11	2 fair	—	42	Ditto.
78	T. H.	M.	41	„ 31	7th	Discrete	R.	June 25	1 doubtful	—	26	Ditto.
79	T. V.	M.	16	„ 31	10th	„	R.	„ 28	1 good	Unsuccessful.	29	Ditto.
80	J. J. H.	M.	6	„ 31	5th	„	R.	July 15	4 fair	—	46	
81	A. B.	F.	21	June 8	8th	„	R.	„ 13	4 good	—	36	
82	M. M.	F.	19	„ 11	6th	„	R.	„ 13	3 good	—	33	
83	M. J. M.	F.	12	„ 11	6th	„	R.	„ 9	4 good	—	29	
84	R. M.	F.	5	„ 11	6th	„	R.	„ 30	*Unvaccinated*	—	50	
85	P. M.	M.	4	„ 11	6th	Semi-confluent	D.	June 16	„	—	6	
86	M. O'N.	F.	⅔	„ 11	4th	Discrete	D.	„ 17	June 1, 1863	—	7	"Under" vaccination.
87	R. P.	M.	29	„ 13	3rd	Confluent	R.	Aug. 6	3 good	—	55	
88	E. B.	M.	9	„ 13	5th	Discrete	R.	July 6	3 good	—	24	
89	W. E.	M.	25	July 25	10th	„	R.	Aug. 26	3 faint	—	33	
90	A. E.	F.	27	Aug. 2	3rd	„	R.	„ 29	Marks (?)	—	28	
91	R. H.	M.	26	„ 6	6th	"Modified"	R.	„ 28	3 good	—	23	At inspector.
92	G. W.	M.	24	Oct. 10	8th	Discrete	R.	Nov. 17	6 good	—	39	
93	T. B.	M.	18	„ 11	4th	„	R.	Dec. 30	3 good	—	81	
94	E. L.	F.	24	„ 11	5th	Confluent	R.	„ 27	2 good	—	78	
95	J. C.	M.	30	„ 11	4th	Discrete	R.	Nov. 25	2 good	—	46	
96	E. R.	M.	25	„ 12	7th	„	R.	„ 10	2 good, 2 fair	—	30	
97	E. M.	M.	28	„ 12	7th	„	R.	„ 10	4 fair	—	30	
98	J. M.	M.	40	„ 12	6th	„	R.	Dec. 1	3 good	—	51	
99	J. O'D.	M.	43	„ 12	6th	„	R.	Nov. 17	2 good	—	37	
100	H. A.	M.	45	„ 12	6th	Hæmorrhagic	D.	Oct. 14	3 faint	—	3	
101	C. M.	M.	17	„ 13	7th	Discrete	R.	Nov. 17	4 good	—	36	
102	C. O.	M.	19	„ 14	4th	„	R.	Dec. 8	2 good	—	56	
103	O. H.	M.	24	„ 16	6th	„	R.	Nov. 17	1 fair, 1 faint	—	33	
104	R. B.	M.	19	„ 18	4th	„	R.	Dec. 8	2 fair	—	52	
105	W. A.	M.	17	„ 20	6th	Confluent	R.	„ 27	*Unvaccinated*	—	69	
106	R. W.	M.	18	„ 21	6th	Discrete	R.	Nov. 10	2 good	—	21	
107	[illegible]. M.	M.	72	„ 18	9th	„	D.	Dec. 15	2 faint	—	59	
108	A. A. W.	F.	18	„ 22	2nd	„	D.	Nov. 21	1 good	—	31	
109	J. M.	F.	21	„ 25	5th		R.	Dec. 20	4 good	—	57	
110	J. H.	M.	20	„ 25	5th	„	R.	Nov. 25	3 good	—	32	
111	W. C.	M.	19	„ 26	6th	„	R.	Dec. 8	4 good	—	44	
112	J. M.	F.	11	„ 27	4th	„	R.	Nov. 10	4 good	—	15	
113	C. J.	M.	56	„ 28	4th	„	R.	Dec. 5	4 good	—	32	
114	J. G.	M.	67	„ 28	4th	„	R.	„ 8	2 faint	—	42	
115	W. P.	M.	63	„ 29	?	Semi-confluent	Still in hospital		2 fair	—	—	
116	M. O'N.	F.	28	„ 30	3rd	„	R.	Dec. 30	4 fair	—	63	
117	W. G.	M.	25	„ 30	5th	Discrete	R.	„ 31	4 fair	—	63	
118	W. M.	M.	19	„ 30	3rd	Confluent	R.	Jan. 1	1 fair	—	64	
119	J. B.	M.	40	„ 30	3rd	Discrete	R.	Dec. 10	1 good	2 attempts both failed.	42	
120	J. C.	M.	27	„ 31	14th	„	R.	„ 30	3 good	—	61	
121	R. W.	F.	7	„ 31	5th	Confluent	R.	Jan. 6	Unvaccinated	—	68	
122	E. McD.	F.	27	„ 31	5th	Discrete	R.	Nov. 19	Marks?	—	20	
123	J. G.	M.	43	Nov. 1	4th	„	R.	Dec. 5	2 good	—	35	
124	T. C.	M.	29	„ 2	5th	Semi-confluent	Still in hospital		1 good, 1 fair.	—	—	From Belmont Road Test House.
125	A. M.	M.	35	„ 2	5th	Discrete	R.	Dec. 30	2 fair	—	59	Ditto.
126	J. L.	M.	49	„ 2	5th		R.	„ 10	5 faint	20 years ago.	39	
127	S. H.	F.	18	„ 2	7th		R.	Nov. 25	1 good	—	24	

No.	Name.	Sex.	Age.	Date of Admission.	Day of Attack.	Type of Small-pox.	Result.	Day of Discharge.	Vaccination Marks.	Re-vaccination.	No. of Days in Hospital.	Remarks.
128	H. G.	M.	18	Nov. 2	4th	Discrete	R.	Dec. 1	2 good	—	30	
129	W. H. L.	M.	41	„ 4	4th	„	R.	„ 30	3 good	—	57	
130	J. A.	M.	22	„ 5	6th	„	R.	Jan. 12	1 good	—	68	
131	F. F.	F.	6	„ 11	5th	„	R.	„ 18	Vaccinated Nov. 11, 1892.	—	69	"Under" vaccination.
132	A. W.	F.	23	„ 12	9th	"Inoculated"	R.	Dec. 10	4 good	—	29	Infected by No. 134.
133	J. T.	M.	32	„ 14	7th	Discret	R.	Jan. 12	2 good	—	60	
134	J. McG.	M.	22	„ 14	4th week.	„	R.	Dec. 8	4 good	—	25	
135	T. B.	M.	25	„ 14	4th	Confluent	Still in hospital		2 good	—	—	From Belmont Road Test House.
136	A. F.	F.	5	„ 15	4th	Discrete	R.	Jan. 5	4 good	—	52	
137	J. H.	M.	62	„ 15	8th	"Modified"	R.	Dec. 7	2 faint	—	23	
138	J. M.	M.	34	„ 17	4th	Discrete	R.	Jan. 18	2 good	Attempt failed.	63	
139	W. C.	M.	28	„ 17	3rd	Confluent	R.	„ 18	2 good	—	63	
140	J. W.	M.	39	„ 17	4th	Discrete	R.	Dec. 9	3 good, 1 faint.	—	23	
141	A. C.	M.	25	„ 18	?	Confluent	Still in hospital		3 good	—	—	
142	J. F.	M.	31	„ 18	4th	Discrete	R.	Jan. 10	2 faint	—	54	An inspector.
143	T. F.	M.	74	„ 19	2nd	„	R.	Dec. 15	2 faint	Unsuccessful.	27	From Belmont Road Test House.
144	J. B.	M.	60	„ 19	4th	„	R.	Jan. 7	No marks	—	50	From Belmont Road Test House. Stated when unvaccinated.
145	J. C.	M.	13	„ 22	11th	„	R.	Dec. 22	2 faint	—	31	
146	J. K.	M.	33	„ 23	6th	„	R.	„ 22	2 good	—	30	
147	T. J.	M.	31	„ 23	6th	„	R.	„ 30	2 good	—	38	
148	F. O.	M.	22	„ 24	8th	„	R.	„ 22	2 good	—	29	SS. "Lake Ontario."
149	W. P.	M.	31	„ 25	7th	Confluent	D.	Nov. 29	2 faint	—	5	
150	G. M.	M.	32	„ 25	10th	Discrete	R.	Dec. 27	4 good	—	33	
151	E. J. C.	M.	26	„ 26	9th	Confluent	Still in hospital		4 good	—	—	
152	E. G.	F.	40	„ 28	6th	Discrete	R.	Jan. 12	1 faint	—	46	
153	A. T.	M.	15	„ 28	5th	„	R.	Dec. 30	4 good	—	33	
154	S. A.	F.	36	„ 29	5th	„	R.	Jan. 19	1 fair	—	52	
155	L. R.	F.	25	„ 30	6th	„	R.	„ 12	1 good	—	44	
156	M. McG.	M.	35	Dec. 1	3rd	Confluent	Still in hospital		Infancy? no marks.	1 week before admission.	—	From Belmont Road Test House. "Under" vaccination.
157	W. C.	M.	16	„ 1	3rd	Discrete	R.	Jan. 18	4 good	27 Nov. 1892.	49	Ditto.
158	G. W.	M.	12	„ 2	4th	„	R.	„ 18	3 good	27 Nov. 1892.	48	Ditto.
159	J. C.	M.	60	„ 2	4th	"Modified"	R.	Dec. 28	2 faint	On admission.	27	From Belmont Road Test House. Symptoms of small-pox, but only slight transient papules.
160	H. W.	M.	49	„ 2	6th	„	R.	„ 30	3 good	Unsuccessful.	29	Ditto.
161	D. L.	M.	15	„ 3	5th	Discrete	Still in hospital		3 fair	—	—	
162	A. B.	F.	21	„ 4	4th	Confluent	„		2 good	—	—	
163	T. M.	M.	62	„ 5	3rd	Discrete	„		2 good	—	—	From Belmont Road Test House.
164	J. D.	M.	34	„ 7	5th	Confluent	„		1 faint	—	—	From SS. "Teutonic."
165	J. L.	M.	?	„ 7	4th	Discrete	R.	Jan. 6	3 good	—	31	
166	L. V.	M.	36	„ 7	4th	„	R.	„ 10	3 fair	Unsuccessful.	35	From Belmont Road Test House.
167	T. F.	M.	14	„ 8	5th	„	R.	„ 7	4 good	—	31	Ditto.
168	E. P.	F.	13	„ 9	3rd	„	R.	„ 6	1 good	Unsuccessful.	29	
169	M. P.	F.	11	„ 9	9th	„	R.	„ 6	1 good	—	29	
170	A. P.	M.	6	„ 9	7th	„	R.	„ 6	1 good	—	29	
171	R. McK.	M.	9	„ 9	?	Confluent	Still in hospital		*Unvaccinated*	—	—	
172	W. D.	M.	54	„ 10	7th	„	„		1 fair	—	—	
173	H. J.	M.	36	„ 10	5th	Discrete	R.	Jan. 6	3 good	—	28	
174	M. L.	F.	49	„ 12	5th	„	R.	„ 19	1 good	—	38	
175	W. L.	M.	61	„ 12	4th	„	D.	Dec. 24	1 faint	—	13	Died from pneumonia *after* small-pox.
176	F. P.	M.	17	„ 17	3rd	„	R.	Jan. 18	2 good	—	33	
177	C. C.	F.	23	„ 18	6th	„	R.	„ 19	1 good	—	33	
178	M. B.	F.	22	„ 19	8th	„	R.	„ 12	2 fair	—	25	
179	M. L.	F.	27	Dec. 22	?	Confluent	Still in hospital		1 faint	—	—	
180	F. D.	F.	25	„ 22	7th	Discrete	R.	Jan. 19	3 good	—	29	
181	S. D.	F.	28	„ 22	4th	„	R.	„ 19	3 fair	—	29	
182	M. S.	F.	24	„ 22	3rd	„	R.	„ 19	2 fair	—	22	

LIVERPOOL.

No.	Name.	Sex.	Age.	Date of Admission.	Day of Attack.	Type of Small-pox.	Result.	Day of Discharge.	Vaccination Marks.	Re-vaccination.	No. of Days in Hospital.	Remarks.
183	R. M.	M.	10	Dec. 22	6th	Semi-confluent	Still in hospital		1 fair	—	—	
184	E. C.	F.	26	„ 23	3rd	Discrete	„		2 good	—	—	
185	J. Q.	M.	13	„ 24	6th	„	„		*Unvaccinated*	—	—	
186	J. D.	M.	24	„ 24	3rd	Confluent	„		4 faint	—	—	
187	M. C.	F.	14	„ 24	5th	Discrete	„		4 faint	—	—	
188	T. T.	M.	15	„ 25	3rd	„	„		1 fair	—	—	
189	G. C.	M.	21	„ 26	6th	„	R.	Jan. 20	1 good	—	26	
190	F. H.	M.	16	„ 27	5th	„	Still in hospital		4 good	—	—	
191	M. S.	F.	45	„ 27	6th	„	„		1 good	—	—	
192	E. B.	M.	21	„ 29	6th	„	„		2 fair	—	—	
193	J. D.	M.	31	„ 29	5th	Confluent	D.	Jan. 6	Vaccination doubtful, no marks.	—	9	Hæmorrhages in skin before death.
194 (1)	S. B.	F.	18	1863. Jan. 4	5th	Discrete	Still in hospital		2 fair	—	—	
195 (2)	M. McD.	F.	1 5/12	„ 9	7th	„	„		*Unvaccinated*	—	—	
196 (3)	R. E.	M.	26	„ 12	6th	„	„		1 fair	—	—	
197 (4)	W. L.	M.	20	„ 13	7th	"Inoculated"	„		4 good	—	—	
198 (5)	M. P.	F.	22	„ 13	10th	Discrete	„		5 fair	—	—	
199 (6)	J. B.	M.	3½	„ 13	3rd	Semi-confluent	„		*Unvaccinated*	—	—	
200 (7)	E. B.	F.	13	„ 14	3rd	„	„		4 good	—	—	
201 (8)	H. B.	M.	23	„ 14	3 weeks	Discrete	„		2 good	—	—	
202 (9)	J. K.	M.	36	„ 19	8th	„	„		2 good	—	—	
203 (10)	M. A. M.	F.	13	„ 20	6th	„	„		4 good	—	—	
204 (11)	A. S.	F.	22	„ 27	5th	„	„		3 good	—	—	
205 (12)	W. D.	M.	26	„ 28	9th	„	„		3 good	—	—	
206 (13)	R. P.	M.	42	„ 30	8th	„	„		5 good	—	—	

APPENDIX VI.

ANALYSIS of Cases of Small-pox with regard to the Type of the Disease and the Character of Vaccination.

VACCINATED CLASS.—Quality of Marks.

I. "*Good*" *Marks.*

—	Discrete.						Semi-confluent.						Confluent.						Modified.				Inoculated.				Total.					
	1.	2.	3.	4.	5.	6.	1.	2.	3.	4.	5.	6.	1.	2.	3.	4.	5.	6.	1.	2.	3.	4.	1.	2.	3.	4.	1.	2.	3.	4.	5.	6.
1 year	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1-5 years	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5-10 „	1	—	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	1	1	—	—
10-15 „	3	3	1	3	—	—	—	—	—	1	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	4	3	1	4	—	—
15-20 „	1	5	4	7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	1	—	—	1	—	1	6	5	8	—	—
20-30 „	5	8	8	5	1	1	—	2	—	—	—	—	—	4	2	1	—	—	—	1	1	—	—	—	—	2	5	15	11	8	1	1
30-40 „	—	7	1	2	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	8	1	2	—	—
40-50 „	4	2	2	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	1	—	—	4	3	3	—	1	—
50-60 „	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—
60-70 „	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—
70 and over	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Age (?)	—	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	—	—
Total	14	27	18	19	2	1	—	2	—	1	—	—	—	5	2	1	—	—	1	2	2	1	—	1	1	2	15	37	23	24	2	1

II. "*Fair*" *Marks.*

—	Discrete.					Semi-confluent.					Confluent.					Total.				
	1.	2.	3.	4.	5.	1.	2.	3.	4.	5.	1.	2.	3.	4.	5.	1.	2.	3.	4.	5.
1 year	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1-5 years	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5-10 „	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—
10-15 „	—	1	1	—	—	1	—	—	—	—	—	—	—	—	—	1	1	1	—	—
15-20 „	1	4	2	—	—	—	1	1	—	—	1	—	—	—	—	2	5	3	—	—
20-30 „	2	5	1	3	1	—	—	—	2	—	—	—	—	—	—	2	5	1	5	1
30-40 „	1	2	1	—	—	—	—	—	—	—	1	—	—	—	—	2	2	1	—	—
40-50 „	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	—	—
50-60 „	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
60-70 „	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
70 and over	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Age (?)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total		13	5	4	1	1	1	1	2	—	2	—	—	—	—	8	14	6	6	1

III.—"*Faint*" *and* "*Bad*" *Marks.*

——	Discrete.					Semi-confluent.					Confluent.					Modified.			Total.				
	1.	2.	3.	4.	5.	1.	2.	3.	4.	5.	1.	2.	3.	4.	5.	1.	2.	3.	1.	2.	3.	4.	5.
1 year	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1-5 years	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5-10 „	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—
10-15 „	—	1	2	2	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	2	2	2	—
15-20 „	—	1	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	2	—	—	—
20-30 „	2	—	3	1	—	2	—	—	—	—	1	—	—	1	—	—	—	—	5	1	3	2	—
30-40 „	—	2	—	—	—	1	—	—	—	—	1	1	—	—	—	—	—	—	2	3	—	—	—
40-50 „	1	—	—	—	1	—	1	—	—	—	—	—	1	—	—	—	—	—	1	1	1	—	1
50-60 „	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
60-70 „	1	1	—	—	—	—	1	—	—	—	—	—	—	—	—	—	2	—	1	4	—	—	—
70 and over	—	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	—	—	—
Age (?)	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—
Total	4	—	6	3	1	3	4	1	—	—	2	1	1	1	—	—	2	—	9	15	8	4	1

IV.—"*Marks not stated.*"

—	Discrete.	Total.
10-15	1	1
20-30	2	2
	3	3

Vaccination Doubtful.

—	Discrete.	Con-fluent.	—
15-20	1	—	1
20-30	—	—	—
30-40	—	1	1
40-50	1	—	1
	2	1	3

Total Vaccinated.

—	Discrete.	Semi-confluent.	Confluent.	Modified.	Inoculated.	—
I.	81	3	8	6	4	102
II.	28	5	2	—	—	35
III.	22	8	5	2	—	37
IV.	3	—	—	—	—	3
	134	16	15	8	4	177

Vaccination Alleged, but no Evidence.

——	Discrete.	Semi-confluent.	—
30-40	—	1	1
60-70	1	—	1
	1	1	2

LIVERPOOL.

—	"Under" Vaccination.				Unvaccinated.				
	Discrete.	Semi-confluent.	Confluent.	—	—	Discrete.	Semi-confluent.	Confluent.	—
1 year	1	—	—	1	1 year	1	—	—	1
5 years	—	—	—	—	5 years	2	4	—	6
5-10 „	1	1	—	2	5-10 „	1	—	2	3
10-15 „	—	—	—	—	10-15 „	1	—	1	2
15-20 „	—	—	—	—	15-20 „	1	1	3	5
20-30 „	1	—	—	1	20-30 „	1	—	—	1
30-40 „	—	—	1	1	30-40 „	—	—	1	1
	3	1	1	5		8	5	7	19

APPENDIX VII.

Fatal Cases of Small-pox.

—	*Vaccinated.*	*"Under" Vaccination.*	*Vaccination doubtful.*	*Unvaccinated.*
Under 1 year	Nil	*No. 86.*	Nil.	*No. 67.*
1- 5 years	Nil	Nil.	„	*Nos. 26, 47, 82.*
5-10 „	*No. 3.* "3 faint marks"	„	„	Nil.
10-15 „	„ 42. "2 bad marks"	„	„	*No. 22.*
15-20 „	Nil	„	*No. 7.*	*No. 5.*
20-30 „	Nil	„	Nil.	Nil.
30-40 „	*No. 149.* "2 very faint marks"	„	*No. 198.*	*No. 66.*
40-50 „	*No. 100.* "3 very faint marks"	„	Nil.	Nil.
50-60 „	Nil	„	„	„
60-70 „	*No. 175.* "1 faint mark"	„	„	„
70 and over	Nil	„	„	„
Age not stated	*No. 61.* "1 fair, 2 faint marks"	„	„	„
	6 cases.	1 case.	2 cases.	7 cases.

APPENDIX VIII.

LIVERPOOL PARISH.

Year.	Births registered during Year.	Of the children whose Births were registered during the Year given in the First Column, by the 31st January in the year next but one following that year there were						
		Successfully Vaccinated.	Certified as Insusceptible of Vaccination.	Had Small-pox.	Died unvaccinated.	Vaccination postponed by Medical Certificate.	Remaining.	The Children not finally accounted for (including cases postponed) being per cent. of Births.
1872	8,508	6,907	5	0	986	610		7·2
1873	7,893	6,441	3	0	972	8	469	6·0
1874	8,169	6,711	4	0	995	10	449	5·6
1875	7,796	6,394	5	0	973	2	422	5·4
1876	7,871	6,604	8	2	894	8	355	4·6
1877	7,664	6,515	8	4	842	7	288	3·8
1878	7,621	6,420	5	0	888	11	297	4·0
1879	7,543	6,358	8	1	839	6	331	4·5
1880	7,300	6,083	4	0	857	7	349	4·9
1881	6,940	5,889	4	0	792	5	250	3·7
1882	6,697	5,590	4	0	799	6	298	4·5
1883	6,290	5,287	5	0	757	4	237	3·8
1884	6,498	5,408	4	0	804	11	271	4·3
1885	6,049	5,067	3	1	692	5	281	4·7
1886	6,022	4,965	5	1	763	6	282	4·8
1887	5,583	4,545	17	0	700	10	311	5·7
1888	5,455	4,545	11	0	652	13	234	4·5
1889	5,267	4,326	15	0	698	8	220	4·3
1890	5,100	4,168	11	0	695	11	215	4·4
1891	5,002	4,153	10	0	634	8	197	4·1
1892	4,934	4,092	11	0	639	12	180	3·9

III.—Report on the Prevalence of Small-Pox at Salford, 1892-93.

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§ 1. *Salford: Area and Population.*

The County Borough of Salford has a total area of 5,170 acres. It is divided into the three townships of Salford (consisting of the municipal districts of Regent Road and Greengate), Pendleton and Broughton. The total population of the borough as estimated in the middle of the year 1891 was 198,717, the mean density of population being 38·5 persons per acre:—

Salford	Regent Road	1,066	74·6	persons per acre.
	Greengate	263	117·1	,, ,, ,,
Pendleton		2,415	21·0	,, ,, ,,
Broughton		1,426	26·6	,, ,, ,,

For the year 1891 the birth-rate was 36·3 per 1,000, and the death-rate 26·9 per 1,000, or according to the several districts—

Regent Road	26·8
Greengate	32·3
Pendleton	25·5
Broughton	19·5

These figures are taken from the Annual Report of the Medical Officer of Health for 1891, and in Appendix I. will be found further statistics as to the prevalence of, and mortality from, zymotic disease since the introduction of compulsory notification in 1883 by a local Act.

As regards small-pox in previous years, the number of deaths registered since 1880 are given in the report referred to, and are as follows:—

Salford: Small-pox Deaths.

1881	7
1882	18
1883	—
1884	—
1885	1
1886	—
1887	—
1888	8
1889	—
1890	—
1891	—
1892	1

§ 2. *Sanitary Administration, especially as regards Epidemic Diseases.*

The sanitary Department is under the control of the General Health Committee of the Town Council, and consists of the following staff:—

1. Medical Officer of Health—C. E. Paget, Esq.
2. Chief Sanitary Inspector.
3. Assistant Sanitary Inspector.
4. Lodging-house Inspector.
5. Veterinary Inspector.
6. Smoke Inspector.
7. Food and Drugs Act, and Canal Boats Inspector.
8. Workshops Inspector (a recent appointment).
9. Drain-testing Inspector.
10. District Inspectors, 5 in number.
11. Disinfecting Staff, 8 members.
12. Office clerks (5) and messenger.

The office is in the Town Hall and is in telephonic communication with Monsall Fever Hospital.

Sanitary districts.

The sanitary districts are five in number, and are not conterminous with the municipal divisions, being apportioned according to the density of population. The district inspectors attend at the office every morning to receive instructions, and again at 4 p.m. to hand in their reports, the inspector in No. 5 division also attending at 2 p.m. (*see* Appendix II). Each inspector can communicate with the office by telephone from the district police stations.

The men employed in the work of disinfection are also engaged on nuisances, when not sufficiently occupied with the former duty.

Steps taken on receipt of notification.

On receipt of the notification at the office the district inspector is sent to the house, where he enters all the particulars of the case and of the several inmates on forms specially provided for the purpose. (Appendix III.) There are various forms drawn up for the several infectious diseases. That for small-pox contains columns for the record of the sex, age, and occupation of each inmate, and of particulars as to vaccination and re-vaccination; the dates on which the patient was first attacked, of the appearance of a rash, of his apparent exposure to infection, and the place where this occurred, and other details bearing on the case. Space is also provided for detailing the steps taken to remove the patient, the hour of his removal, the disinfecting the house, &c.*

If there is a doubt about the case the medical officer goes to see it, and sometimes he is called in by the medical attendant to see the case before notification.

No delay is lost in sending to the hospital for the ambulance, and the record is kept of the time at which

* Mr. Paget was good enough to furnish me with copies of each of the filled in forms of all the cases of small-pox. It is from them that I have mainly gleaned the facts about the present outbreak, and from which I have drawn up the tactle in Appendix.

SALFORD.

Disinfection of house.

the case is removed from the house.* Within an hour from the removal of a small-pox patient to hospital the house is fumigated, the bedding, &c. removed to be disinfected, the walls stripped (Appendix IV.).

In regard to this the Public Health Act notice (Appendix V.) is at once served on the householder, and if he takes no steps within 24 hours the Health Department takes the matter into its own hands. As a matter of fact the department does all the disinfection gratuitously, the cost being borne by the rates, although the householder may be called on to pay this. Even among the wealthy the department is often invited to do the disinfection.

No undue pressure is exercised to induce people to be removed to hospital. It is almost taken as a matter of course. Sometimes it is necessary to bring some moral suasion to bear, and the employer of the patient, or if a child, the school it attends is informed of the illness. Mr. Paget is convinced that the enforcement of the Act by a magisterial order does but little good.

These is no removal of the inmates of infected houses to a place of quarantine; but they are kept from attending work or school for about a week, and the house is kept under supervision for a fortnight.

Hospital accommodation.

Under an agreement with the Manchester Infirmary Board, Salford, in common with some other districts, is entitled to accommodation for cases of infectious disease at Monsall Fever Hospital, where some 70 or 80 beds are set aside for these outlying districts. For this accommodation Salford contributes the annual sum of 100*l*. When small-pox appeared in Salford the cases were sent to Monsall, but owing to the great demand on the wards reserved for this disease from the large number sent in from Manchester no further room could be obtained. At the date of my first visit to Salford (January 23) the Medical Officer of Health of Salford had been just informed by the infirmary that no more cases of small-pox could be received from Salford as the wards were full. The Health Committee, therefore, at once took steps to secure a site in Mode Wheel Road for a temporary small-pox hospital. So prompt was their action that at the date of my next visit, a month later, the buildings were nearly completed. Meanwhile the old building in Cross Lane, which had been first in use as a small-pox hospital in 1876, and subsequently as a fever sanatorium, was at once furnished anew, and on January 26th it received cases of small-pox. This building is to be again vacated with the transference of the cases to the Mode Wheel site, and in a few months it will pass out of the hands of the Corporation.†

Selection of site for temporary hospital.

The first case to be admitted into Wilton Hospital was that of a navvy working on the Ship Canal. This was on January 24th, and within the next five days 14 cases had been admitted into the same building. On the 29th Mr. Paget with Dr. Mullen inspected various sites, and selected one on the Mode Wheel Road to the north of the borough as the most fitting for a temporary hospital. On February 1st he reported to the Health Committee that since December 22nd there had been 24 cases of small-pox in Salford, that 10 of these had been sent to Monsall and 14 to Wilton. He pointed out that the rate of increase since January 24th had been sudden, averaging two cases *per diem*, and that there was not accommodation for more than 30 cases in Wilton, which besides might be required for fever cases if Ladywell were full. He also pointed out that the distribution of the disease through the borough had been very wide, and proposed that the piece of land at Mode Wheel should be rented and enclosed, and that Messrs. Humphreys should be instructed to erect four wards capable of containing 48 to 50 patients, together with the necessary offices. That these buildings should be used as the principal small-pox hospital, Wilton being used for overflow cases so long as it remained in the hands of the Corporation. The estimated cost of the buildings was 2,000*l*. with 1,000*l*. for furnishing, but the land could only be obtained for one, or at the most, two years. This was carried by the Town Council, and by February 5th the brick foundations had been laid.

The ground on which the temporary hospital has been built adjoins the Corporation Sewage Works on the one side, and the borough cemetery on the other (see map), the municipal boundary and the Manchester Ship Canal bounding it on the south. The buildings (Pl. V.) which have been put up by Messrs. Humphreys comprise two detached pavilions, each of two wards to contain 12 beds. The entrance to the wards is in the centre of the pavilion, where are rooms for the nurses on duty, and offices, whilst at the extremity of each ward is a bath-room and watercloset. These two blocks, between 20 and 30 feet apart, are distinct from the next block, which is devoted to the nurses' dormitories and sitting rooms by 60 feet. About 20 feet behind that there are two detached blocks, one for the servants, the other for the kitchen. A separate building is apportioned to the medical officer, whilst in connexion with the porter's lodge is a bath-room and dressing-rooms, which will be used by the patients on their discharge from the hospital. There is also a small mortuary provided. The chief feature of this provisional hospital, which will probably be capable of being utilised for 20 years, is in the separation of the administrative offices from the wards, and the detachment of the several departments of the administration from one another. It is not unlikely that in course of time some more permanent accommodation may be found for the administration. It will be under the general supervision of the medical officer of Ladywell Sanatorium, and an assistant medical officer will reside in the building.

§ 3. *Small-pox in Salford*, 1892–93.

There have been 49 cases of small-pox known to the authorities since the first case notified on September 18th to February 20th inclusive.‡ Three other cases were also notified, but after being isolated they proved not to be variola. The rate of increase has been notably greater during the months of January and February than last year. Thus, in September there was only one case, in October and November there were no cases, in December four cases, in January 18 cases, 15 of which were in the latter half of the month, and in February (to the 20th) 27 cases. In the following table, showing the weekly incidence, I have stated the number of cases notified in the corresponding weeks at Manchester, for which I am indebted to Dr. Tatham, the Medical Officer of Health for that city, and the Diagram (C.) is intended to illustrate the comparative incidence of the disease during this period in these neighbouring towns.

TABLE I.

Weekly Incidence of Small-pox.

	Salford.		Manchester.
	Attacked.	Notified.	Notified.
August 20, 1892	0	0	1
„ 27 „	0	0	1
September 3, 1892	0	0	0
„ 10 „	0	0	2
„ 17 „	1	0	4
„ 24 „	0	1	1
October 1 „	0	0	4
„ 8 „	0	0	7
„ 15 „	0	0	3
„ 22 „	0	0	4
„ 29 „	0	0	0
November 5 „	0	0	1
„ 12 „	0	0	8
„ 19 „	0	0	1
„ 26 „	0	0	2
December 3 „	0	0	2
„ 10 „	0	0	11
„ 17 „	1	0	14
„ 24 „	2	2	19

* This is done with the utmost despatch, the case being admitted into hospital within two hours of the receipt of notification.

† After visiting Mode Wheel buildings Mr. Paget took me to see the Ladywell Sanatorium, the newly erected fever hospital standing on the outskirts of the borough close to Eccles. In point of view of construction, of internal arrangements in every detail, this establishment is most admirable. The resident medical officer is Dr. Mullen, and the transfer from Wilton Street took place in August last. As no cases of small-pox are treated at Ladywell, I need not describe it here, but I cannot refrain from expressing my admiration of the whole establishment in which every advantage has been taken of modern knowledge.

‡ Since then, and up to May 5th, there have been, I am informed by Mr. Paget, 76 additional cases, making a total to that date of 125.

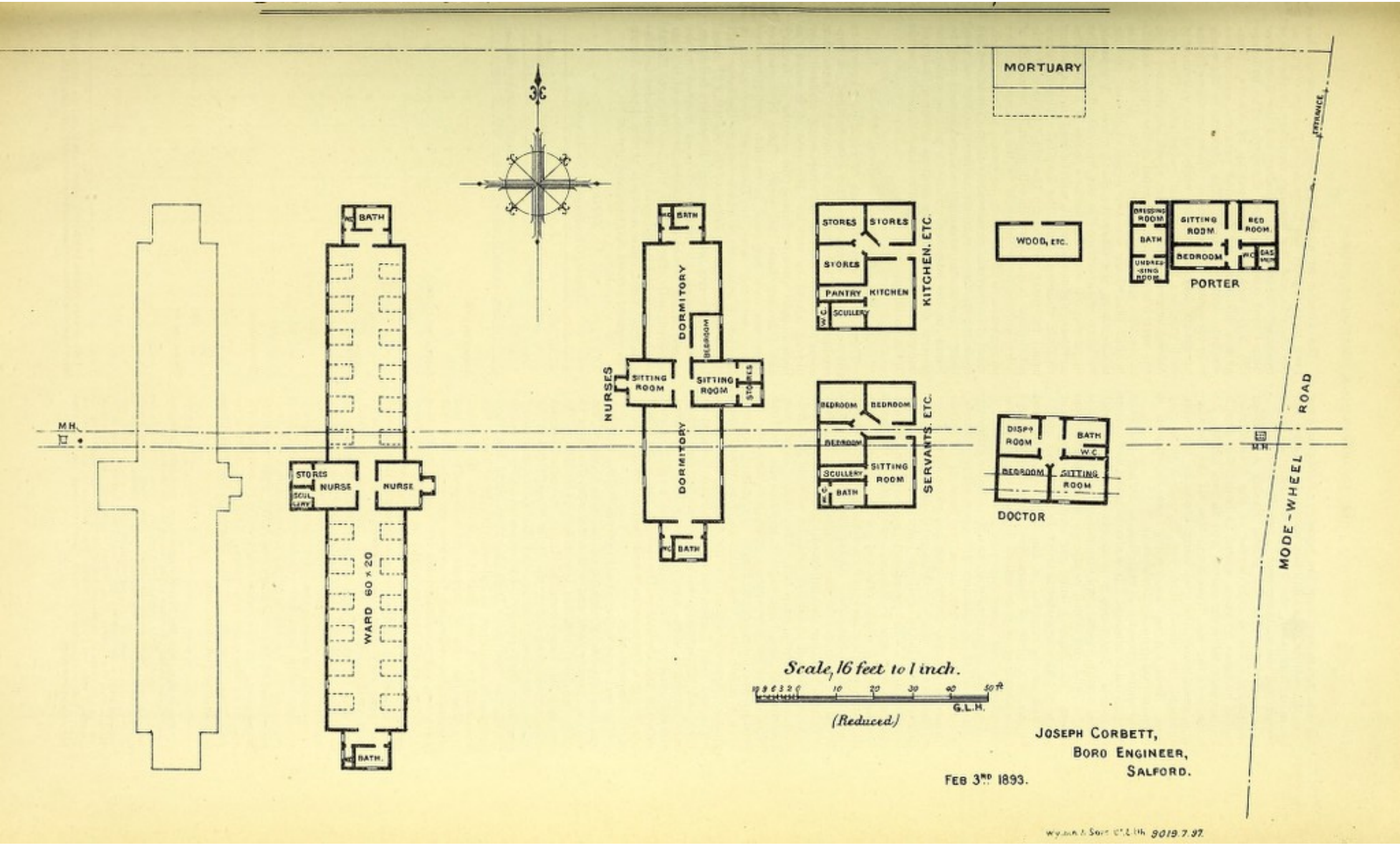
MORTUARY
ENTRANCE
BATH
STORES
NURSE
NURSE
SCUL
LAMP
BATH
WARD 60 x 20
BATH
M.H.
NURSES
DORMITORY
BEDROOM
SITTING ROOM
SITTING ROOM
STORES
DORMITORY
BATH
STORES
STORES
STORES
PANTRY
KITCHEN
KITCHEN. ETC.
W.C.
SCULLERY
WOOD, ETC.
BEDROOM
BEDROOM
BEDROOM
SCULLERY
SITTING ROOM
BATH
SERVANTS. ETC.
DRESSING ROOM
BATH
UNDRESSING ROOM
SITTING ROOM
BED ROOM
BEDROOM
W.C.
PORTER
DISP.G ROOM
BATH
W.C.
BEDROOM
SITTING ROOM
DOCTOR
M.H.
MODE-WHEEL ROAD
Scale, 16 feet to 1 inch.
12 8 6 3 2 0 10 20 30 40 50 ft
G.L.H.
(Reduced)
JOSEPH CORBETT,
BORO ENGINEER,
SALFORD.
FEB 3RD 1893.

TABLE I.—*continued.*

—	Salford.		Manchester.
	Attacked.	Notified.	Notified.
December 31, 1892	1	2	20
January 7, 1893	2	0	21
„ 14 „	2	2	67
„ 21 „	4	3	48
„ 28 „	15	8	56
February 4 „	2	9	44
„ 11 „	12	9	19
„ 18 „	7*	10	20
Total	49	46	380

* 3 of these notified on Feb. 20.

It will be seen that the disease had obtained a considerable foothold in Manchester before it attained anything like epidemic proportions in Salford. The first case, which occurred in *September*, was removed from a common lodging-house. The patient was a mechanic from Sowerby Bridge, Yorkshire, but who had probably been infected at Stalybridge on his way to Warrington, where he stayed before coming to Salford. He had only been in Salford for three days when he fell ill. Following this case there was an interval of three months before another case occurred in Salford, although in *November* two cases, which subsequently proved not to be small-pox, were reported. Of the four cases occurring in *December*, one (No. 2 in Table, Appendix VI.) was a navvy on the Ship Canal, who had been lodging in Salford for three days, and who was probably infected at Warrington. Two others (Nos. 3 and 4) were employed in Manchester. The source of infection in the fourth case (No. 5) was not traced. In *January* there were 18 cases. One (No. 6) contracted the disease from her father (No. 5), the rash in his case appeared on December 25th, and she was removed to hospital on January 10th. No. 7 was a blacksmith who worked in Manchester; he probably infected his brother (No. 12), whose rash appeared on January 25th, 14 days after No. 7 had been removed. No. 10 was transferred from the workhouse whither he had gone from a Manchester lodging-house. No. 9 may have been infected through a fellow servant who had been visiting at Warrington, but who did not herself take the disease. No. 11 was a labourer on the Ship Canal, and was thought to have been infected at Padley Wood. No. 19 was a showman, who may have been infected on the Fair Ground in Stretford Road. No. 20 had been lodging at Warrington. No. 21 may have been infected by a friend who lived at Manchester, and was removed to Monsall Hospital on January 19th. No. 21 herself had the rash on the 30th. There remain nine cases arising in January of which the origin is doubtful. Of the 26 cases in *February* (to the 20th) six were connected with a previous case living at No. 16, A—— Street. He was a man 50 years of age, and his two sons (Nos. 35 and 36) fell ill 12 days after he had been removed. Nos. 30 and 34, living in C—— Lane and S—— Street respectively, were known to have been in contact with the foregoing, whilst Nos. 38 and 39 were neighbours, residing at 18, A—— Street. No. 41 was removed on February 14th from the same house whence No. 22 had been taken on January 30th, and No. 42, also removed on February 14th, lived next door to them. Nos. 31, 32, and 33 were members of one family, who had probably been infected by a lodger who was reported to have had a rash two or three weeks before, but whose case was not at the time recognised as small-pox. No. 45 (fatal) with her child, No. 46, were probably infected by her husband, who two or three weeks before had been confined to bed and had an eruption on his face. No. 37 was engaged in Manchester. No. 44 may have been infected in Manchester where she had been on a visit, and No. 48 may also have been infected in Manchester whilst seeking employment there. There remain 11 cases not traced.

So far as the inquiries made by the inspectors go the number of "associated cases" has been comparatively small—namely, 15. They form five groups, three of two cases in the same household, one of three cases, two of which were in one house, and one group of six cases, three in one house, one in another, and two in another. In other words, of the 50 cases there were 43 infected houses, yielding a very small proportion of cases per household.

Six cases were removed from a like number of lodging-houses, no second case (up to February 20th) having occurred in any one of them.* Three tramps were removed from the workhouse where they had stayed for one or two nights only; they had come into Salford from common lodging-houses at Manchester, Bolton, and Rochdale.

Of these 50 cases seven have died, or 14 per cent., and 25 still remained under treatment on March 2nd. (I am indebted to Dr. Mullen, the physician superintendent of Ladywell Sanatorium for the information on this head.) The age incidence may be gathered from the following table:—

* Since this was written the following instance of a second case occurring in a lodging-house has been furnished me by Mr. Paget. "On "March 4th the wife of the keeper of the lodging-house, No. 1A P—— "Place, was found to be suffering from small-pox; on March 11th the "keeper himself became ill, and, though the house was on each occasion "disinfected, two cases amongst lodgers occurred on the 30th. It is "possible that in this case the husband may have contracted the "disease from his wife. . . . But the two cases of lodgers had "probably no connection with the other cases, being cattle drovers and "not permanent lodgers. In view, however, of their both sickening at "the same time and sleeping in the same room, I promptly closed that "room in the lodging-house, after disinfection, and reduced the number "of beds that might be occupied in any one room in that house, by one "half. No further case has occurred in it."

TABLE II.

Small-pox.—Sex and Age Incidence.

—	Males.			Females.			Both Sexes.			Total.
	Recovered.	Died.	Remain in Hospital.	Recovered.	Died.	Remain in Hospital.	Recovered.	Died.	Remain in Hospital.	
Under 1 year	—	1	—	—	—	1	—	1	1	2
1 to 5 years	—	1	1	—	—	2	—	1	3	4
5 to 10 years	1	—	1	—	—	1	1	—	2	3
10 to 15 years	1	—	2	—	—	—	1	—	2	3
15 to 20 years	2	—	1	—	—	1	2	—	2	4

SALFORD.

TABLE II.—*continued.*

—	Males.			Females.			Both Sexes.			Total.
	Recovered.	Died.	Remain in Hospital.	Recovered.	Died.	Remain in Hospital.	Recovered.	Died.	Remain in Hospital.	
20 to 30 years	7	—	3	2	1	5	9	1	8	18
30 to 40 years	1	2	3	1	1	2	2	3	5	10
40 to 50 years	1	1	1	—	—	—	1	1	1	3
50 to 60 years	2	—	—	—	—	—	2	—	—	2
Total	15	5	12	3	2	12	18	7	25	49

As regards the vaccination relations of these patients, the reports do not for the most part afford definite information upon the number and quality of the cicatrices amongst the vaccinated, of whom there were 39. Hence in the following table I have merely analysed the cases according to their ages and the types of variola under the headings of the "Vaccinated" and the "Unvaccinated" and "Doubtful," only one falling under the last category. I have also included the "semi-confluent" cases with the "confluent." It thus appears that of the total number (including those who are still under treatment) four out of 39 of the "Vaccinated" have died, and three out of the 10 "Unvaccinated"; that 16 of the former were confluent cases, whilst eight of the latter were confluent and only two discrete.

TABLE III.

Small-pox.—Vaccination Data.

—	Vaccinated.			Unvaccinated.			Vaccination doubtful.			Total.
	Recovered.	Died.	Remain in Hospital.	Recovered.	Died.	Remain in Hospital.	Recovered.	Died.	Remain in Hospital.	
Under 1 year	—	—	—	—	1	1	—	—	—	2
1 to 5 years	—	—	1	—	1	2	—	—	—	4
5 to 10 years	—	—	1	1	—	1	—	—	—	3
10 to 15 years	1	—	1	—	—	1	—	—	—	3
15 to 20 years	2	—	2	—	—	—	—	—	—	4
20 to 30 years	9	1	7	—	—	—	—	—	1	18
30 to 40 years	2	2	4	—	1	1	—	—	—	10
40 to 50 years	1	1	1	—	—	—	—	—	—	3
50 to 60 years	2	—	—	—	—	—	—	—	—	2
	17	4	17	1	3	6	—	—	1	49

TABLE IV.

Type of Small-pox.—Vaccination Data.

—	Vaccinated.			Unvaccinated.		Vaccination doubtful.		Total.
	Confluent.	Discrete.	Type not stated.	Confluent.	Discrete.	Confluent.	Discrete.	
Under 1 year	—	—	—	2	—	—	—	2
1 to 5 years	1	—	—	2	1	—	—	4
5 to 10 years	1	—	—	1	1	—	—	3
10 to 15 years	1	1	—	1	—	—	—	3
15 to 20 years	1	2	1	—	—	—	—	4
20 to 30 years	6	10	1	—	—	1	—	18
30 to 40 years	3	3	2	2	—	—	—	10
40 to 50 years	1	1*	1	—	—	—	—	3
50 to 60 years	1	1	—	—	—	—	—	2
	15	18	5	8	2	1	—	49

* A malignant case.

The information respecting the other inmates of the houses whence cases have been removed, which is given on each of the forms, is stated numerically in the table (Appendix VII.). The total number of cases of which these particulars are given is 37, containing 171 inmates (86 males, 85 females). The particulars as to vaccination are lacking in 19 of them; but of the rest, 148 are returned as having been vaccinated in infancy or childhood, and 4 as not vaccinated. 28 had been re-vaccinated, a number which would be increased if these stated as intending to be re-vaccinated were done. The ages and occupations of the inmates are also recorded on the forms, but it is hardly necessary to classify them here. Only four of the people exposed to infection in these cases had previously had small-pox.

Mr. Paget informed me that in September last he called on the board of guardians of the Salford Union, and at his instance a handbill was issued on September 23rd (Appendix VI.) calling attention to the prevalence of small pox in the adjoining towns and recommending vaccination and re-vaccination, the hours and places where public vaccination was performed being indicated. The distribution of these bills was left to the vaccination officers, and was almost limited to those who came to the stations for the vaccination of their children. Hearing that no result followed this publication, Mr. Paget obtained permission of the Health Committee to have a house-to-house delivery of another issue of bills, and he inserted in these bills a few statistics of the relative mortality of small-pox among the vaccinated and unvaccinated respectively. This distribution occupied about a fortnight, and was just completed at the time of my first visit. Up to that date, however, the public vaccinators reported to Mr. Paget there had been practically no increase in the applications for vaccination (I understand that during February the number of re-vaccinations has been considerable)—Appendix VIII. It may be pointed out that the hours at which the vaccination stations are open are not very suitable for a working population, and possibly some of the neglect of re-vaccination may be attributed to this cause. But it is also not possible under the existing system of public vaccination to secure the aid of the public vaccinator in the re-vaccination of mill hands and others, except at the recognised hours and stations, without the sanction of the Local Government Board. An instance of this difficulty arose in the case of a factory at Salford, whose hands, about 100 in number, mostly lived in Manchester, and one of whom was attacked by small-pox, and removed to Monsall Hospital in the second week of January. Mr. B——, one of the firm who owned the factory, sought Mr. Paget's advice, which was to the effect that the workers should be promptly re-vaccinated; but on applying to the public vaccinator he (Mr. Paget) learnt that it would be necessary that those requiring to be re-vaccinated should go to the station, about half a mile distant from the mill. Meanwhile other cases arose in the mill, three on the 20th, and three on the 21st, so Mr. Paget took upon himself to guarantee the payment by the Corporation of the sum required for the re-vaccination of the mill hands; and on the 21st January, Dr. C——, the public vaccinator, vaccinated 21 of the people, and the rest were to be done on the 23rd, the day of my visit to Salford. From an economical point of view Mr. Paget said that the cost of vaccinating a community like that was justified, since it would not amount to as much as the cost of maintenance of a single case in hospital.

Lastly, in respect to the measures taken in the case of the common lodging-houses, which are especially exposed to invasion by infected persons, the inspectors have visited every such house daily, for since September every case of illness reported in them has been inquired into, and the keepers of the lodging-houses have cordially co-operated with the sanitary department in their efforts. Early notice of a case of small-pox is then certain to be received, and, as stated, there has not been a second case in any one of the common lodging-houses whence cases have been removed.

Conclusions.

1. The sanitary administration of Salford, and the arrangements in force with respect to infectious diseases, seem to be very complete and thorough.

2. The recent acquisition of a special hospital for the treatment of small-pox cases, necessitated by the pressure on the accommodation at Monsall Hospital, is of great advantage to the town.

3. That the sanitary service and methods of prompt isolation, disinfection, &c., have been fully adequate is, I think, shewn by the smallness of the groups of "associated cases," and by the comparatively small number of fatal cases, considering the proximity to Manchester, whilst the epidemic was then at its height.

4. It is remarkable that so few adults availed themselves of the opportunities offered for vaccination and re-vaccination during the epidemic of small-pox.

In conclusion I beg to thank Mr. Paget for all the information and assistance he has rendered me, and also Dr. Mullen for kindly furnishing me with details of the cases admitted to hospital.

S. C.

London, March 10th, 1893.

LIST OF APPENDICES.

I. *Statistics of Infectious Diseases at Salford*, 1883-1891 (*from Report of Medical Officer of Health*).
II. *Duties of the District Inspectors of Nuisances.*
III. *Steps taken by Health Officers in visiting Invalided Houses.* (*Memorandum by Mr. Paget, M.O.H.*).
IV. *Rules to be observed in Removal of a Fever Patient to Hospital.*
V. *Form of Notice re Disinfection of Houses.*
VI. *Table of Cases of Small-pox*, 1892-93.
VII. *Handbills inviting Re-Vaccination.*
VIII. *Returns of Adult Vaccination, January 21st to March 11th.*
IX. *Salford Union. Vaccination Returns*, 1872–1892.

APPENDIX I.

SALFORD.—NOTIFICATION OF INFECTIOUS DISEASES.

(*From Report of Medical Officer of Health for the Year* 1891.)

Total numbers of cases of notifiable diseases (exclusive of membranous croup and erysipelas) during each year since notification came into force within the borough, together with their yearly rates per 1,000 of the population, as corrected after the Census of 1891 :—

Year.	Number of Cases.	Rates per 1,000 of Population.
1883	1,195	or 6·5
1884	1,694	„ 9·2
1885	969	„ 5·1
1886	1,902	„ 10·1
1887	1,889	„ 9·9
1888	1,971	„ 10·2
1889	2,476	„ 12·7
1890	2,068	„ 10·5
1891	1,101	„ 5·5

Cases notified during the Year 1891.

Quarters.	Total Cases.	Small-pox.	Scarlet Fever.	Diphtheria.	Membranous Croup.	Enteric Fever.	Typhus Fever.	Continued Fever.	Puerperal Fever.	Erysipelas.
1st	296	—	122	82	5	67	—	—	4	16
2nd	189	—	82	44	4	38	—	—	3	9
3rd	233	—	102	52	—	66	—	3	—	10
4th	455	—	176	44	1	207	1	2	6	18
Year	1,164	—	482	222	10	378	1	5	13	53

APPENDIX II.

COUNTY BOROUGH OF SALFORD.

Duties of the District Inspectors of Nuisances.

1. To leave the office not later than 9.30 a.m. every morning.

2. On leaving the office to proceed without delay to the houses in their several districts where fresh cases of infectious disease have been notified, and to fill in the printed forms of information regarding each case for the use of the Medical Officer of Health.

3. Their next duty is to attend to written and verbal complaints in their districts received up to the time of their leaving the office, and special matters referred to them by the Medical Officer of Health or the Chief Inspector of Nuisances.

4. Their next duty is to proceed with a systematic and regular inspection of portions of their districts, so that every court and passage may be regularly inspected at least four times in the year, and to pay visits to see if work ordered to be done has been put in hand, or is progressing satisfactorily, or has been completed.

5. The district inspector's books must be ready to be looked over by the Medical Officer of Health or the Chief Inspector of Nuisances, at 9 a.m. every day, but if seen first by the latter official the books will be also gone over by the Medical Officer of Health.

6. The district inspectors are due back at the office in the Salford Town Hall at, but not before, 4 p.m. each day, from Mondays to Fridays inclusive.

7. The inspectors are allowed one hour in each day, except Saturdays, for their dinner.

Duties of.

1. Assistant inspector of nuisances.
2. Drainage inspector.
3. Lodging-house inspector.
4. Smoke inspector.
5. Canal boats and food and drugs inspector.
6. Workshops inspector.

These inspectors will leave the office not later than 10 a.m. every morning.

Their books are to be laid every morning before the Medical Officer of Health after being posted up.

A. L. DICKINS,
Chairman of the Health Committee
of the County Borough of Salford.

October 6th, 1892.

COUNTY BOROUGH OF SALFORD.

It is the duty of each district inspector to send word to this office, with the utmost despatch, for the removal of cases of infectious diseases to the hospital.

CHARLES E. PAGET,
Medical Officer of Health.

Health Department,
October 11th, 1892.

APPENDIX III.

The following memorandum by Mr. Paget, forming his reply to one of a series of questions addressed to him by the Commission, fully describes the steps taken in respect to the inmates of infected houses, and the notification of schools and libraries of the presence of infectious disease in households having children at school or using books from the library:—

"The inmates of houses invaded by small-pox are "not specially isolated; but the vaccination of un- "vaccinated persons, and the re-vaccination of pre- "viously vaccinated persons, is in all cases recom- "mended. Immediately after receipt of notification, "the sanitary inspector or myself fills up the accom- "panying *green coloured form*, which thus furnishes "my department with full information as to the in- "mates of the house. This form is filed, and if I find "that the inmates neglect to be vaccinated or re- "vaccinated, without good cause being shown why "they should not, I communicate with their employers, "if they be employed, and in other ways prevent "them mingling for a time with other folk. In the "case of children attending a public elementary "school, information is sent to the schoolmaster or "mistress as per enclosed Form *A*. Information is "also sent to the librarians of all the public libraries, "in case books may have been lent to the family, or "may be applied for before all risk of the spread of "infection is passed. This is done by Form *B*. en- "closed."

(Enclosure referred to.)

(Green coloured Form.)

County Borough of Salford.

Regent Road District.

Small-pox.

Name _____ Age _____ Emm.

District _____

Family _____ Lodger _____

Address _____

How long in house _____

Size of house _____

Medical attendant _____ . First called in ____

Notified _____ o'clock.

_____

Age.		Occupation.	Place of Work or School.	S.P. Hist.*	Onset.	Rash.	Hospital.	Vaccination.		Revaccinated.	Last at Work.
M.	F.							Date.	Character.		

* A=Had S.P. B=Not had S.P. C=Now ill.

Probable source of infection:—

Contact on 13th, 14th, 15th day before rash.

Persons in contact with patient after onset:—

Nature of isolation _____

_____

Precautions adopted:—

Patient removed to _____ hospital.

Other inmates _____

Persons in contact _____

Neighbours _____

Employer communicated with by _____

School attended _____

Written _____

House—rooms requiring stripping? _____

Clothing—requiring disinfection? _____

Bedding—requiring disinfection? _____

Cautionary notes. _____

_____

_____

Date of fumigation _____

Date of stripping _____

Rooms stripped _____

Date bedding and clothing stoved _____

Confirmed inspection (14 days after this date)—

Date of _____

Result _____

SALFORD.

Termination of case—

Date of discharge _____

Date of death _____

Dated _____ o'clock. This _____ day of _____ 18 .

Signed _____

(*Form A.*)

Public Health Department,
Town Hall, Salford.
18

THE sanitary inspector for your district reports that small pox is present at No.
which I am informed is the residence of
one of the pupils in attendance at your school.

I would suggest, in the interest of the public health, that you should not receive into your school any pupils from this house until it has been certified free from infection.

I am, Sir,
Yours faithfully,
(Signed) CHARLES E. PAGET,
Medical Officer of Health.

To the Schoolmaster
of School

(*Form B.*)

Health Office,
Town Hall, Salford,
189

DEAR SIR,

CASES of infectious diseases have this day been reported to me at the under-mentioned addresses.

Yours faithfully,
(Signed) CHARLES E. PAGET.

Address.	Disease.

To the Librarian
_____ Library.

APPENDIX IV.

COUNTY BOROUGH OF SALFORD.

Rules to be observed on the Removal of a Fever Patient to Hospital.

1. The patient will be removed in the ambulance, with such parts of the bedding as may be convenient.

2. At the same time the remainder of the bedding and other articles of linen and clothing as may be in the patient's room, and likely to be infected, will be removed in another van to the hospital, for efficient disinfection in the apparatus there.

Special Instructions.

It is essential that the removal of linen and clothing should be at the same time as the patient is removed, lest any part of them (already perhaps infected) may be put away, and at a later date give rise to fresh cases of fever. This danger must be particularly avoided where cases of scarlet fever, small-pox, typhus fever, and diphtheria are concerned.

Within twenty-four hours after the removal of a patient to the hospital, but immediately after if possible, the room vacated by the patient must be properly disinfected.

Rules to be observed in the Process of House Disinfection.

1. On receipt of instructions from the foreman the disinfectors will proceed at once to the houses to be disinfected.

2. The disinfectors will then prepare the room or rooms for efficient disinfection, thus:—

(*a.*) Everything in a room must be arranged so as to be exposed thoroughly for fumigation; drawers must be opened, linen and clothes hung on lines across the room, books set on end or hung on lines, so that the leaves may be open, and all parcels untied and the contents freely exposed.

(*b.*) Any clock in a room may be removed after being carefully wiped over with a damp cloth which has been dipped in water containing carbolic acid in the proportion of four tablespoonfuls of powder to each gallon of water, and the cloth must then be left in the room.

(*c.*) The chimney of the room must be closed up very carefully, and also the window or windows, so as to prevent any escape of fumes during disinfection.

(*d.*) One pound of sulphur to every 1,000 cubic feet of space must be placed over a pail of water in the middle of the floor of the room, but not too close to any hanging articles of linen or clothing, and be set fire to.

(*e.*) The disinfector will then at once leave the room, and on closing the door proceed, by pasting brown paper around its edges, to prevent the escape of sulphurous fumes from the room.

(*f.*) The door is not then to be re-opened till at least two hours from the time of its being closed.

(*g.*) On the door being re-opened the windows are to be opened at the same time, the chimney also opened and a fire to be lighted in the grate, and the room thus thoroughly well ventilated.

(*h.*) The walls must then be brushed down, and, where papered, the wall paper must be thoroughly scraped off. All woodwork is to be washed down with soft soap and hot water containing carbolic acid powder, in the proportion of four tablespoonfuls to each gallon of water. The floors, bedstead, and furniture are to be thoroughly scrubbed in the same manner by the tenant.

(*i.*) The tenant must limewash the ceiling, and also the walls, and be advised to distemper the walls rather than to re-paper them in any bedroom.

IT WILL BE THE DUTY OF EACH DISTRICT INSPECTOR, AS FORMERLY, TO SUPERINTEND THE DISINFECTION OF PREMISES, AND TO REPORT ANY NEGLECT OF THE FOREGOING PROVISIONS OF THE RULES.

CHARLES E. PAGET,
August, 1889. Medical Officer of Health.

APPENDIX V.

Form of Notice served on Householders of Infected House.

_____ District.

Town Hall, Salford,
Public Health Department, _____ 189 .

NOTICE.

The Mayor, Alderman, and Burgesses of the County Borough of Salford (herein-after called the Corporation), and being the Local Authority, within the meaning of the Public Health Act, 1875, are of opinion, on the Certificate of their Medical Officer of Health, that the cleansing and disinfecting of certain premises, viz., the interior of a dwelling-house of which you are the _____, situate in _____ within the said borough, will tend to prevent or check infectious disease _____

THE CORPORATION DO THEREFORE HEREBY require you, within twenty-four hours from the delivery to you of this order, to thoroughly cleanse, limewash, and disinfect the interior of the said house in such manner as is stated on the back of this Form.

AND NOTICE IS HEREBY GIVEN, that unless the said requirements are carried out and completed in such manner as directed, within the said period, the Corporation will cause the work herein specified to be done, and recover from you the expenses thereof.

CHARLES E. PAGET,
Medical Officer of Health,
Acting for the above-mentioned Local Authority.

To Mr. _____

_____

_____

Any information relative to the above will be given on application to the Medical Officer of Health, Town Hall, Salford, from 9 a.m. to 5 p.m.

RULES TO BE OBSERVED IN THE PROCESS OF DISINFECTION.

1. Everything in the room to be disinfected must be arranged so as to be exposed thoroughly for fumigation. Drawers must be opened; linen and cloths hung on lines across the room; books set on end or hung on lines, so that the leaves may be open; and all parcels untied, and the contents fully exposed.

2. Any clock in the room may be removed after being carefully wiped over with a damp cloth, which has been dipped in water containing carbolic acid in the proportion of four tablespoonfuls of powder to each gallon of water, and the cloth must then be left in the room. SALFORD

3. The chimney of the room must be closed up carefully, and also the window or windows, so as to prevent any escape of fumes during disinfection.

4. One pound of sulphur to every 1,000 cubic feet of space must be placed over a pail of water, in the middle of the floor of the room, but not too close to any hanging articles of linen or clothing, and be set fire to.

5. The person setting fire to the sulphur will at once leave the room and close the door, and proceed by pasting brown paper round its edges, to prevent the escape of the sulphurous fumes from the room.

6. The door of the room is not then to be re-opened *till at least two hours* from the time of its being closed and the lighting of the sulphur.

7. On the door being re opened, the windows are to be re-opened at once, the chimney also opened, and a fire to be lighted in the grate, and the room thus thoroughly well-ventilated.

8. The walls must then be brushed down, and, where papered, the wall paper must be thoroughly scraped off. All woodwork is to be washed down with soft soap and hot water (containing carbolic acid powder in the proportion of four tablespoonfuls to each gallon of water), and the floors, bedstead, and furniture are to be thoroughly scrubbed in the same manner.

9. The ceiling and the walls must be limewashed, and it is strongly urged that the walls of rooms, and bedrooms especially, be distempered rather than be re-papered.

As to cleansing and disinfecting Soiled Linen or Clothes, when not sent for Disinfection by the Authority.

1. The best plan is to hang them on lines in an oven, and to bake them for an hour or more.

2. The next best plan is to place them in a tub containing water which completely covers them, and contains carbolic acid powder in the proportion of four tablespoonfuls to each gallon of water. The clothes should be then *steeped for two days*, boiled, and then washed in the ordinary way quite separately from all other things.

N.B.—Any change of colour arising from the above treatment speedily disappears in subsequent washings.

CHARLES E. PAGET,
Medical Officer of Health.

APPENDIX VI.

Table of Cases of Small-pox at Salford, 1892-93.

No.	Name.	Sex.	Age.	Notification.	Onset.	Rash.	Removal to Hospital.	Type.	Result.	Date of Discharge.	Days in Hospital.	Vaccination.		Number of other Inmates of Houses.					Remarks.
												Date.	Number and Character of Marks.	Males.	Females.	Vaccinated.	Unvaccinated.	Re-vaccinated.	
1	T. E. B.	M.	15	Sept. 18	—	Sept. 18	Sept. 18	—	Recovered	Oct. 18	32	Infancy	Faint	—	—	—	—	—	Eighteen other lodgers.
2	R. H.	M.	31	Dec. 22	—	Dec. 22	Dec. 22	—	„	Feb. 14	54	„	Three poor vaccin.	—	—	—	—	—	Navvy on Ship Canal.
3	S. A. B.	F.	35	„ 24	Dec. 21	„ 22	„ 24	—	„	Jan. 24	32	Childhood	Good	1	1	2	—	—	
4	R. W.	M.	41	„ 29	„ 25	„ 29	„ 29	Malignant	Died	Dec. 30	2	Infancy	„	2	—	2	—	2	
5	E. A.	M.	40	„ 29	„ 14	„ 25	„ 29	—	Recovered	Feb. 10	44	Childhood	„	2	3	5	?	2	
6	M. E. A.	F.	7½	Jan. 10	—	—	Jan. 10	Confluent	Still in hospital			Infancy	„	—	—	—	—	—	
7	G. S.	M.	25	„ 12	Jan. 6	Jan. 11	„ 11	—	Recovered	Feb. 3	24	Childhood	„	1	1	2	—	—	
8	J. K.	M.	20	„ 15	„ 13	„ 14	„ 15	Discrete	„	„ 24	40	„	„	1	—	1	—	—	Eight other lodgers
9	I. E. B.	F.	32	„ 20	„ 11	„ 16	„ 20	„	Still in hospital			Infancy	„	1	2	3	—	—	
10	S. H.	M.	20	„ 20	„ 18	—	„ 20	Semi-confluent	„			?	?	—	—	—	—	—	
11	H. E.	M.	20	„ 24	„ 19	Jan. 23	„ 24	Confluent	Recovered	Feb. 27	35	Childhood	„	3	5	5?	—	1	
12	W. S.	M.	21	„ 26	„ 22	„ 25	„ 26	Discrete	„	„ 18	24	Infancy	„	—	—	—	—	—	*See* No. 7.
13	H. L.	M.	2½	„ 26	—	—	„ 26	Confluent	Died	„ 28	26	*Not vaccinated*		2	8	No information.	—	—	
14	S. K.	F.	26	„ 27	Jan. 22	Jan. 27	„ 27	„	Recovered	„ 25	30	Infancy	Bad	1	2	1	—	—	
15	E. L.	F.	20	„ 27	„ 16	„ 22	„ 27	Discrete	„	„ 11	16	„	Good	1	1	2	—	1	
16	T. W.	M.	31	„ 27	„ 20	—	„ 27	Confluent	Died	„ 8	13	„	„	—	—	—	—	—	From tramp ward, workhouse.
17	S. T.	M.	21	„ 27	„ 23	—	„ 27	Discrete	Recovered	„ 18	23	„	Moderate	—	—	—	—	—	„ „
18	T. S.	M.	7	„ 28	„ 26	Jan. 28	„ 28	Confluent	Still in hospital			*Not vaccinated*		—	2	2	—	—	
19	W. S.	M.	22	„ 30	„ 28	„ 30	„ 30	Discrete	Recovered	Feb. 18	19	—	Four, moderate	13	4	17	—	—	From a lodging-house. Case sent from Hope Hospital.
20	A. U.	M.	5	„ 30	„ 24	„ 27	„ 28	„	„	„ 18	22	*Not vaccinated*		10	4	11	3	5	
21	A. W.	F.	21	„ 30	„ 23	„ 30	„ 30	„	Still in hospital			Infancy	Good	2?	4	6	—	1	Two inmates had had small-pox.
22	J. S.	M.	10	„ 30	„ 25	„ 28	„ 30	Confluent	„			*Not vaccinated*		3	1	4	—	—	
23	J. U.	M.	50	„ 30	„	„ 25	„ 30	Discrete	Recovered	Feb. 18	22	Infancy	Good	4	1	5	—	—	
24	J. S.	M.	38	Feb. 1	„ 23	„ 30	Feb. 1	Confluent	Still in hospital			*Not vaccinated*		1	2	3	—	—	
25	C. A.	M.	13	„ 1	„ 26	„ 31	„ 1	Discrete	Recovered	Feb. 17	17	Infancy	Good	1	5	6	—	—	
26	A. J. F.	F.	32	„ 2	„ 24	„ 31	„ 2	Confluent	Still in hospital			„	„	2	3	5	—	1	
27	T. K.	M.	34	„ 2	„ 28	Feb. 1	„ 2	„	Died	Feb. 7	6	*Not vaccinated*		—	1	1	—	—	
28	M. K.	M.	20	„ 7	Feb. 2	„ 5	„ 7	„	Still in hospital			Infancy	Good	2	3	5	—	2	

No.	Name.	Sex.	Age.	Notification.	Onset.	Rash.	Removal to Hospital.	Type.	Result.	Date of Discharge.	Days in Hospital.	Vaccination.		Number of other Inmates of Houses.					Remarks.
												Date.	Number and Character of Marks.	Males.	Females.	Vaccinated.	Unvaccinated.	Re-vaccinated.	
29	E. G.	F.	6/12	Feb. 8	—	Feb. 4	Feb. 8	Confluent	Still in hospital			*Not vaccinated*		1*	2	3	—	1	* Has had small-pox.
30	W. B.	M.	54	„ 10	Jan. 27	„ 10	„ 10	—„—	Recovered	Mar. 2	22	Infancy	Good	3	—	—	—	2	
31	F. L. W.	M.	about 30	„ 11	Feb. 7	„ 11	„ 11	Discrete	Still in hospital			„	Two, poor vaccin.	4	—	3	—	—	A lodger, male, æt. 23, probably had small-pox three weeks ago. See No. 33.
32	S. A. W.	F.	27	„ 11	„ 6	„ 8	„ 11	Confluent	Died	Feb. 15	5	*Not vaccinated*							
33	W. W.	M.	14/52	„ 11	„ 6	„ 8	„ 11	„	„	„ 15	5								
34	W. C.	M.	15	„ 11	„ 8	„ 9	„ 11	Discrete	Recovered	„ 23	13	Childhood	Four, good	4	4	8	—	—	
35	F. W. U.	M.	17	„ 11	„ 9	„ 11	„ 11	Confluent	Still in hospital			Infancy	Good	—	—	—	—	—	
36	F. E. U.	M.	30	„ 11	„ 9	„ 11	„ 11	Discrete	Recovered	Feb. 23	13	„	„	—	—	—	—	—	
37	J. W.	M.	11	„ 12	„ 10	„ 12	„ 12	Confluent	Still in hospital			Childhood	„	5†	4	9	—	3	† One has had small-pox.
38	S. H. B.	M.	25	„ 13	„ 8	„ 9	„ 13	Discrete	„			„	„	—	1	1	—	—	
39	E. B.	F.	28	„ 13	„ 11	„ 11	„ 13	Confluent	„			„	„	—	—	—	—	—	
40	T. W.	M.	47	„ 13	„ 9	„ 12	„ 12	Discrete	„			„	„	3	4	7	—	3	
41	E. N.	F.	17	„ 14	„ 13	—	„ 14	„	„			Infancy	„	1	1	2	—	—	
42	F. L.	F.	4	„ 14	„ 10	Feb. 12	„ 14	Confluent	„			„	„	2	2	42	—	—	‡ Two have had small-pox.
43	S. A.	F.	37	„ 15	„ 15	„ 15	„ 16	Discrete	„			„	Good	1	3	4	—	—	
44	S. A. K.	F.	36	„ 17	„ 12	„ 13	„ 17	Confluent	Died	Feb. 25	9	„	„	2	4	6	—	—	
45	A. K.	F.	3	„ 17	„ 13	„ 14	„ 17	„	Still in hospital			*Not vaccinated*							
46	F. C.	F.	25	„ 18	„ 9	„ 18	„ 18	Discrete	„			Infancy	Good	2	2	4	—	2	
47	M. C.	M.	34	„ 20	„ 16	„ 18	„ 20	„	„			„	„	2	2	4	—	—	
48	J. I.	M.	14/12	„ 20	„ 14	„ 17	„ 20	„	„			*Not vaccinated*		1	1	2	—	—	
49	M. A. K.	F.	27	„ 20	„ 18	„ 20	„ 20	Confluent	„			Infancy	Good	1	2	3	—	1	

SALFORD.

APPENDIX VIII.

SALFORD:—RETURNS from VACCINATION STATIONS of the NUMBER of PERSONS VACCINATED between January 21st, 1893, and March 11th, 1893.

1. At the Working Men's Hall, John Street, Pendleton, and at 219, Bolton Road, Pendlebury:—

Number of Adult Primary Vaccinations - 5
" " Re-vaccinations - 41

(Signed) THOMAS N. ORCHARD,
Public Vaccinator,
Pendleton.

2. Brotherton Hall, 252, Chapel Street, Salford:—

Number of Adult Primary Vaccinations - 1*
" " Re-vaccinations - 26

(Signed) A. CARSON CLARKE, M.D.,
Public Vaccinator,
1st District, Salford Union.

* This was the only adult case of primary vaccination, but there were a number of boys and girls of various ages.

3. Conservative Club Room, Liverpool Street, Salford:—

Number of Adult Primary Vaccinations none
" " Re-vaccinations - - 39

(Signed) THOS. M. JOHNSON,
Public Vaccinator,
S. Salford District, Salford Union.

4. Broughton District, Salford.

	Primary Vaccinations.	Re-vaccinations.
Over 21 years of age - -	1	10
From 15 to 21 years - -	0	20
From 10 to 15 years - -	3	24
From 5 to 10 years - -	3	1
	7	55

(Signed) F. G. ROBINSON,
Public Vaccinator.

APPENDIX IX.

SALFORD UNION.

RETURNS OF VACCINATION, 1872 to 1822.

Year.	Births registered during Year.	Of the Children whose Births were registered during the Year given in the First Column, by the 31st January in the Year next but one following that Year, there were: Successfully Vaccinated.	Certified as Insusceptible of Vaccination.	Had Small-pox.	Died Un-Vaccinated.	Vaccination postponed by Medical Certificate.	Remaining.	The Children not finally accounted for (including cases postponed) being per cent. of Births.
1872	5,662	4,840	10	0	596	216		3·8
1873	5,791	4,974	3	0	609	27	178	3·5
1874	6,123	5,117	3	0	645	93	265	5·8
1875	6,657	5,699	4	3	685	59	207	4·0
1876	7,025	5,974	10	7	740	39	255	4·2
1877	7,112	6,151	8	1	697	30	225	3·6
1878	7,419	6,203	5	0	907	40	264	4·1
1879	7,306	6,064	4	0	817	71	350	5·8
1880	7,388	5,993	6	0	915	71	403	6·4
1881	7,092	6,017	10	0	686	68	311	5·3
1882	7,335	6,095	5	0	801	97	337	5·9
1883	7,043	5,809	8	0	785	109	332	6·3
1884	7,296	5,972	16	0	844	132	332	6·4
1885	7,226	5,863	17	0	810	136	400	7·4
1886	7,480	5,905	14	0	969	176	416	7·9
1887	7,173	5,559	17	0	915	205	477	9·5
1888	7,373	5,650	35	0	905	193	590	10·6
1889	7,239	5,499	20	0	928	186	606	11·0
1890	7,227	5,379	20	0	953	236	639	12·1
1891	7,467	5,477	10	0	1,020	190	770	12·9
1892	7,448	5,506	20	0	845	236	841	14·5

IV.—Report on the Prevalence of Small-Pox at Manchester, 1892-93.

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§ 1. *Manchester: Population, Sanitary Administration.*

The City of Manchester was extended by the Act of 1890 to include the three registration districts of Manchester, Chorlton, and Prestwich, and at the census of 1891 the population of the whole city amounted to 594,502.*

The several sub-registration districts or townships are the following:—

I. *Manchester Township.*—1. Ancoats. 2. Central. 3. St. George's.
II. *North Manchester*—4. Cheetham. 5. Crumpsall. 6. Blackley. 7. Harpurhey. 8. Moston. 9. Newton Heath. 10. Bradford. 11. Beswick. 12. Clayton.
III. *South Manchester.*—13. Ardwick. 14. Openshaw. 15. Gorton (West). 16. Rusholme and Kirkmansholme. 17. Chorlton-on-Medlock. 18. Hulme.

The sanitary districts are not in every case conterminous with the foregoing, being 11 in number.

	Townships.	Estimated Population.	
I.	Ancoats	46,729	From Quarterly Report of the Medical Officer of Health for Second Quarter of 1893.
	Central	37,698	
	St. George's	63,179	
II.	Cheetham	29,569	
	Crumpsall	8,221	
	Blackley	7,476	
	Harpurhey	3,579	
	Moston	5,646	
	Newton Heath	35,165	
	Bradford	21,154	
	Beswick	10,221	
	Clayton	3,621	
III.	Ardwick	36,665	
	Openshaw	26,568	
	Gorton (West)	25,910	
	Rusholme and Kirk	18,133	
	Chorlton-upon-Medlock	69,415	
	Hulme	72,413	

* The estimated population in the middle of 1893 is given by Dr. Tatham as 517,760. (Quarterly Return of Medical Officer of Health second quarter of 1893.)

The average rate of mortality from all causes in the three unions of Manchester, Chorlton, and Prestwich, for the 20 years 1871 to 1890, was 25·7 per 1,000 persons living; the rate for the existing City of Manchester as extended by the Act of 1890 was for 1891 26·0, and for 1892, 23·2.

As regards the prevalence of infectious diseases it may be mentioned that for the years 1871-90 in the above unions the average death-rate per 1,000 was for small-pox 0·14; measles 0·68; scarlet fever 0·78; diphtheria, 0·16; whooping cough 0·71; typhus fever 0·07; enteric fever 0·30; simple continued fever 0·09; diarrhœa and dysentery 1·29; cholera 0·03. There have been no small-pox deaths, 1889 to 1892. [For a full statistical summary of these rates, see the table compiled by Dr. Tatham, Appendix I.]

Sanitary administration.

The sanitary government* of Manchester is vested in the City Council, acting as the Urban Sanitary Authority. This body consists of 104 members, of which 26 are aldermen, and the rest common councillors.

Practically the sanitary welfare of Manchester is committed to two committees of the Council, named respectively the Sanitary Committee and the Cleansing Committee. To the former of these, the following duties are delegated by the Council:—

Sanitary committee.

The administration of the Public Health Act, 1875, and the amending Act of 1889, the Infectious Diseases Prevention Act, 1890, and the Compulsory Notification of Infectious Diseases Act (Local) of 1881.

To this Committee is relegated the duty of dealing with infectious diseases within the city, of providing for the isolation of the infectious sick, and generally, of safeguarding the public health of the inhabitants.

Cleansing committee.

To the Cleansing Committee, the City Council have assigned the cleansing and sweeping of the streets, the scavenging of the city, and the disposal of the town's refuse at the various depôts and sewage farms belonging to the city. As this department possesses a large establishment of horses, the removal of patients to the fever hospital, and of infected bedding is effected by the Cleansing Department on behalf of the Sanitary Committee; they also superintend the needful arrangements for the disinfection of houses after zymotic disease. The present Sanitary Department and its Committee are the result of a reorganisation which was effected in the year 1890.

Previous to that year most of the functions now discharged by the Sanitary Committee and the Cleansing Committee between them were carried out by a single authority, under the title of "Health Committee," which was appointed in the year 1867; at which time also, the

* I am greatly indebted to Dr. Tatham for the full information given in this section of the Report.

MANCHESTER.

first Medical Officer of Health, Mr. John Leigh, M.R.C.S., received his appointment.

Under the Health Committee, which at that time consisted of many of the leading members of the Corporation, a vast amount of sanitary work was effected, including the abolition throughout the city of the Lancashire midden cesspool, the establishment of a complete ambulance department with disinfecting appliances, &c., in connexion with the hospital for infectious diseases, the establishment of a sewage farm at Carrington for the utilisation of town's refuse, and the inauguration of an effective service for night and day scavenging throughout the city.

The control of the Sanitary Department, together with the Inspectors of Nuisances and other members of the staff is, under the new *régime*, entrusted to a lay superintendent, who is responsible to the Committee, as its executive officer, for the efficiency and good conduct of his staff, consisting of two "chief sanitary inspectors," and 28 "district sanitary inspectors."

Medical officer.

Dr. Tatham, the present Medical Officer of Health of the City of Manchester, holds a position which is, at any rate, unusual. He was appointed in the year 1889 and is the medical adviser of the Council, but, unlike his colleagues in other great towns, he has no special connexion with the Sanitary Department.

He has a separate office and clerical staff for the compilation of statistics and the issue of returns, reports, &c.; and in matters relating to control of infectious disease, and to removal of conditions injurious to health, the services of the sanitary officers, inspectors, &c., are at his command; but he has no direct relationship with the Sanitary Department, or indeed with any other department of the Corporation.

It is more than questionable whether this position is a satisfactory one from the point of view of justice towards the Medical Officer of Health. For this officer, if he is to be held responsible for the safety of the public health, should certainly be at the head of the Sanitary Department, and should exercise constant control and supervision over the entire preventive organisation of the city.

Control of infectious disease.

The Sanitary Department possesses two chief inspectors and 28 district sanitary inspectors, to each of whom a certain area of the city is allotted for inspection. Each sanitary inspector is responsible for the visitation of cases of infectious disease in his district, and for the removal to hospital of such cases as require it, as well as for the disinfection of houses, bedding, &c.

Compulsory Notification of Infectious Disease has been in vogue here since the year 1881, in which year powers were obtained under a local Act. The diseases, notification of which is required in Manchester, are small-pox, scarlet fever, diphtheria, typhus, typhoid, relapsing, and puerperal fever, cholera, and, more recently, membranous croup. The Act works well and without friction in Manchester, and is believed by Dr. Tatham to be, in conjunction with its natural complement, hospital accommodation, an efficient instrument for controlling the spread of infectious disease.

Procedure in cases of infectious disease.

As regards the procedure adopted in cases of infectious disease, the sanitary inspectors call at the Public Health Office three times a day, to receive instructions relative to cases notified from their districts. They are furnished with the forms * or schedules, upon which they enter all the details of the cases. There is telephonic communication between the Health Office and police stations, so that if a notification is received after an inspector has left for his district, he can be communicated with.

By far the majority of cases of small-pox have been removed to hospital without demur on the part of the patients or their friends.† The case is removed as speedily as possible by the Ambulance Department; whilst the officers of the Cleansing Department attend to convey all the infected clothing, bedding, &c., to Monsall Hospital to be disinfected in the disinfector there.

The disinfection of the house is undertaken by the sanitary inspector, the chief agent here employed being "euchlorine," produced by acting on chlorate of potash with hydrochloric acid. Sometimes fumigation by sulphur is employed. The house is then handed over to the officers of the Cleansing Department, who dress the walls with a strong solution of caustic soda, and strip them of paper. These measures are done at the charge of the Corporation, and the occupants of the house are not given the option of doing it themselves.

* There is a series of printed forms on different coloured paper for the various diseases. For a copy of the one referring to small-pox *see* Appendix II.

† Thus out of a total of 805 cases, only 8 were treated at home.

Schools and public libraries are notified by the medical officer of the occurrence of infectious disease amongst pupils and readers (Appendices IV., V., VI., VII.), and the former are further informed when it is safe for the children of an infected household to return. *

Isolation hospitals.

In connexion with the City of Manchester, though not in its own possession, there are two fever hospitals, and one temporary small-pox hospital, and in supplement of the latter, the Corporation have lately fitted up a third hospital for the treatment of overflow cases of small-pox.

The principal fever hospital is situate at Monsall, a district about two miles from the centre of the city, where also is placed the chief temporary small-pox hospital; the second or supplementary institution for small-pox being placed at Clayton Vale, at a distance of about one mile from Monsall, and about equi-distant with the latter hospital from the centre of the city.

Monsall Fever Hospital.

The Monsall Fever Hospital stands on an airy site of 13¾ acres of ground, on the north side of Manchester. Most of the wards are of modern construction, and are well suited for the purpose of a fever hospital. The hospital at present contains 436 beds, namely, 416 in six pavilions, including an isolation block for different forms of fever, and one pavilion of 20 beds, *within this same enclosure*, for cases of small-pox. (See *Plan* .)

This arrangement for treating fever and small-pox, in adjacent pavilions, is certainly highly objectionable and dangerous; it has been frequently condemned by the Medical Officer of Health, who, in a special report to the Corporation dated 19th September 1892 (soon after the commencement of the present epidemic) thus alludes to it:—

"The Medical Officer of Health reports that since the "appointment, on the 30th August, of a Special Committee "*re* future hospital provision for infectious diseases, he "has given much careful thought to the subject, and has "paid several visits to Monsall with the object of inform- "ing himself accurately as to the disposal of existing "buildings on the site of that hospital.

"It appears that the area of ground at present occupied "by the Monsall Hospital is about 13¾ acres, and that "on this site all kinds of infectious diseases (except "cholera) are treated, 354 beds being at present available "for that purpose.

"The only arrangement for the separate isolation of "the several kinds of infectious disease consists in the "allotment of one or more pavilions for the accommoda- "tion of each several description of fever, and of one "pavilion for the separate accommodation of small-pox.

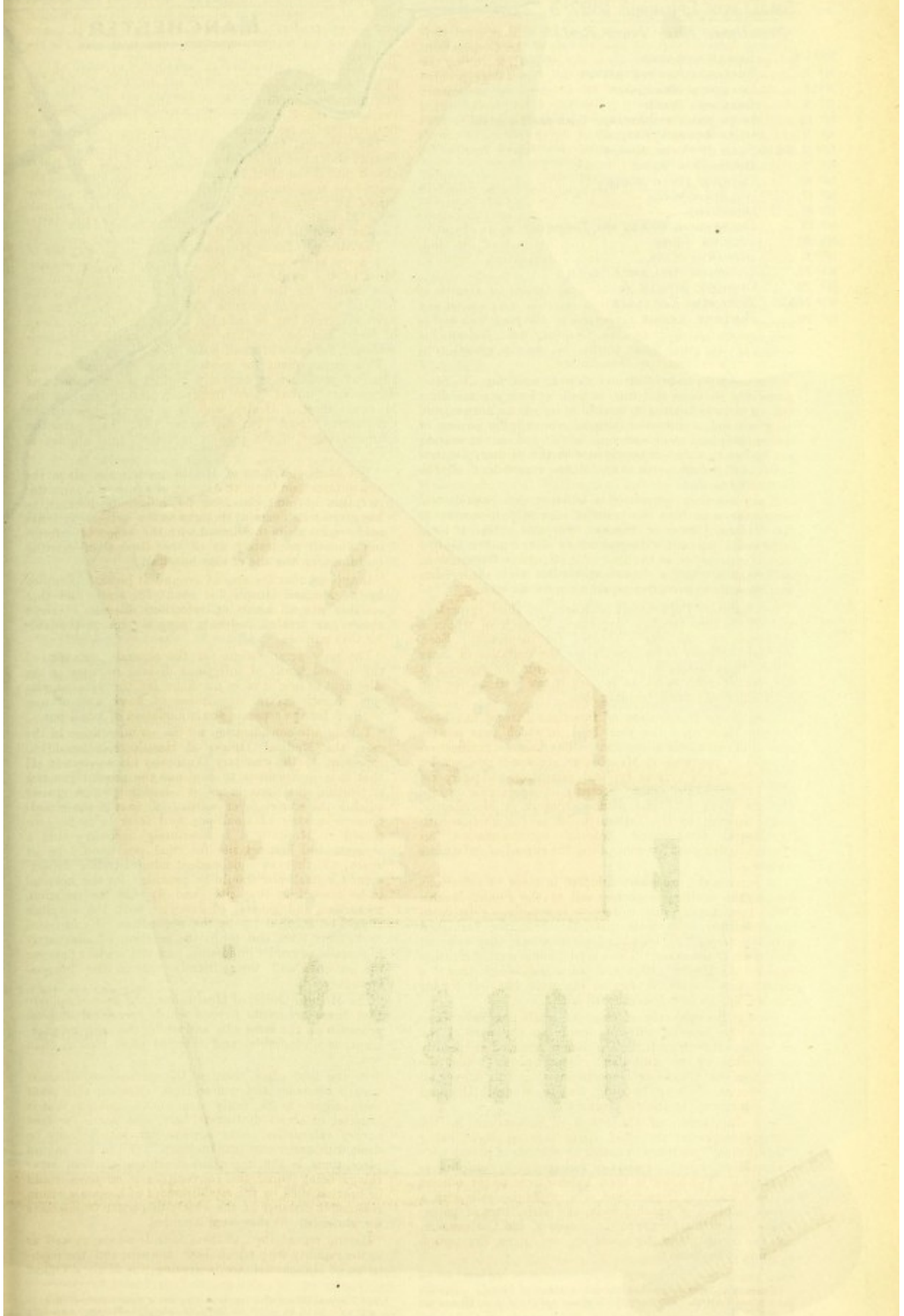
"Taking into consideration all the circumstances of the "case, the Medical Officer of Health feels bound to "represent to the Sanitary Authority his conviction (1) "that it is inexpedient to continue the present practice "of treating small-pox cases in a building which closely "adjoins the scarlet fever wards; (2) that if the simul- "taneous isolation of small-pox and fever is to be con- "tinued at Monsall, it is absolutely necessary that a "separate and distinct site for small-pox should be set "apart; (3) that an independent administrative depart- "ment for small-pox should be provided for the hospital "to be erected on that site; and (4) that the isolation, "protection, and general efficiency of both the hospitals "should be secured (*a*) by the acquisition of additional "contiguous land, and (*b*) by the erection of adequately "high walls to render impossible personal contact between "the patients and their friends outside the hospital "boundary.

"The Medical Officer of Health has long been of opinion "that there are limits beyond which *permanent hospital* "*provision* on the same site, and under the same manage- "ment, is undesirable, and this for more reasons than "one.

"In the first place, there is the question of adminis- "trative efficiency and convenience. And on this point "there seems to be fairly unanimous opinion that a "hospital of about 400 *adult beds, with space for tem- "porary enlargement*, is as large as can satisfactorily be "dealt with under one management. And in the second "place, there is the important consideration that, other "things being equal, the convenience of relatives would "be best satisfied by the establishment of hospitals within "reasonable distance of the widely-dispersed populations "for whose benefit they were intended.

"Having regard, then, to these considerations, as well as "to the rapidity with which both the area and the popu- "lation of Manchester are increasing, the Medical Officer

* The Medical Officer also issues a circular giving information as to the precautions to be taken in cases of infectious disease (Appendix III.).



MANCHESTER.

in September, 15 in October, 13 in November, and 65 in December. In January the number of cases notified in Manchester reached a total of 218, and in February of 85, March 78, April 83, May 95, when the epidemic began to decline rather rapidly. The number for June was 38, for July 8, and for August 7.

Distribution of small-pox in the City.

The distribution of the cases of small-pox amongst the various townships is well illustrated in the annexed series of spot maps which Dr. Tatham has kindly had prepared for this report. They embrace a period of 13 months or 57 weeks, commencing August 1st, 1892, and terminating September 2nd, 1893. The course of the epidemic may very well be traced on these maps. It will be observed that the disease was most prevalent in the most densely populated parts of the city, viz., the three townships of Ancoats, Central and St. George's, which constitute the Manchester township; that more cases occurred in North Manchester, the majority in Newton Heath township, than in South Manchester, where it prevailed most in the Hulme township. The only township in which no cases at all occurred during this period was that of Clayton. The following table gives the numerical statement which is illustrated in the maps :—

	1892.					1893.								Total.
	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	
I. Manchester Township :														
Ancoats	—	1	—	—	5	31	19	9	16	14	—	—	—	95
Central	1	—	—	—	8	15	15	9	7	7	2	—	—	64
St. George's	—	7	6	4	17	68	29	22	22	29	12	3	4	223
														— 382
II. North Manchester														
Cheetham	1	1	2	—	—	5	4	5	7	1	—	—	—	26
Crumpsall	—	—	—	—	—	—	3	1	1	3	4	—	—	12
Blackley	—	—	—	—	—	—	1	1	2	1	—	—	—	5
Harpurhey	—	—	—	—	—	3	2	2	2	2	—	1	—	12
Moston	—	—	—	—	—	5	4	—	3	5	7	1	—	25
Newton Heath	—	1	5	9	12	38	19	14	6	8	5	3	—	120
Bradford	—	—	1	—	—	—	2	—	2	1	—	—	—	6
Beswick	—	—	—	—	—	—	2	—	—	1	—	—	—	3
Clayton	—	—	—	—	—	—	—	—	—	—	—	—	—	—
														— 269
III. South Manchester :														
Ardwick	—	—	—	—	—	5	2	1	2	3	—	—	—	13
Openshaw	—	—	—	—	—	—	1	1	—	4	3	—	—	9
Gorton (West)	—	—	—	—	7	—	—	1	1	2	—	—	—	11
Rusholme and Kirkmansholme	—	—	—	—	—	—	1	2	2	—	—	—	—	5
Chorlton-on-Medlock	—	—	—	—	—	9	5	2	—	5	—	—	2	23
Hulme	—	—	—	—	15	11	2	11	6	15	1	—	1	62
														— 123
Total	2	10	14	13	64	190	111	81	79	101	34	8	7	714

Monthly and weekly incidence.

The subjoined tables are compiled from the returns furnished me by Dr. Tatham.* They comprise not only the 717 cases notified to the Medical Officer of Health in Manchester, from March 7th, 1892, to August 10th, 1893, but in addition, the 97 cases admitted into Monsall Hospital from outlying districts within this period.

It will be seen that the number of deaths was 59, which gives a mortality of 7·2 per cent. (on a total of 814 cases) :—

*These figures are based on the Table of Cases (Appendices VIII. and IX.).

TABLE.

Small-pox.—Monthly Incidence.

	Cases notified in Manchester.		Cases admitted to Monsall Hospital from other Districts.		Total.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
1892.						
March	2	—	2	—	4	—
April	3	—	—	—	3	—
August	2	—	9	—	11	—
September	9	—	7	2	16	2
October	15	1	3	—	18	1
November	13	—	—	—	13	—
December	65	2	4	—	69	2
1893.						
January	218	19	23	1	241	20
February	85	5	8	—	93	5
March	78	3	8	1	86	4
April	83	7	12	1	95	8
May	95	8	13	4	108	12
June	38	3	7	—	45	3
July	8	1	1	—	9	1
August	3	1	—	—	3	1
Total	717	50	97	9	814	59

OUTLINE MAPS OF THE CITY OF MANCHESTER SHEWING THE MONTHLY PROGRESS OF THE EPIDEMIC OF SMALL POX, AUGUST 1892 TO AUGUST 1893, AND THE DISTRIBUTION OF THE CASES IN THE VARIOUS TOWNSHIPS.

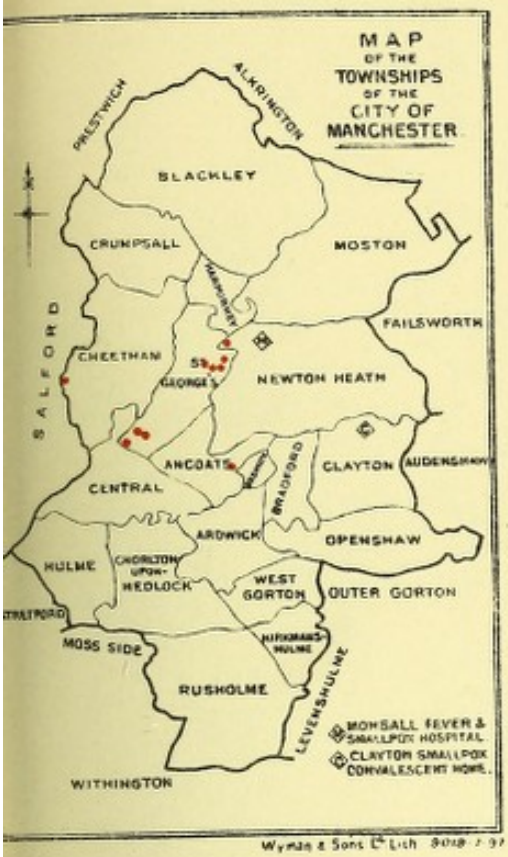
(Specially prepared under the direction of Dr Tatham, Medical Officer of Health to the City of Manchester.)

IX. *August 1892. 5 weeks ending 3rd September*



Wyman & Sons Ltd Lith

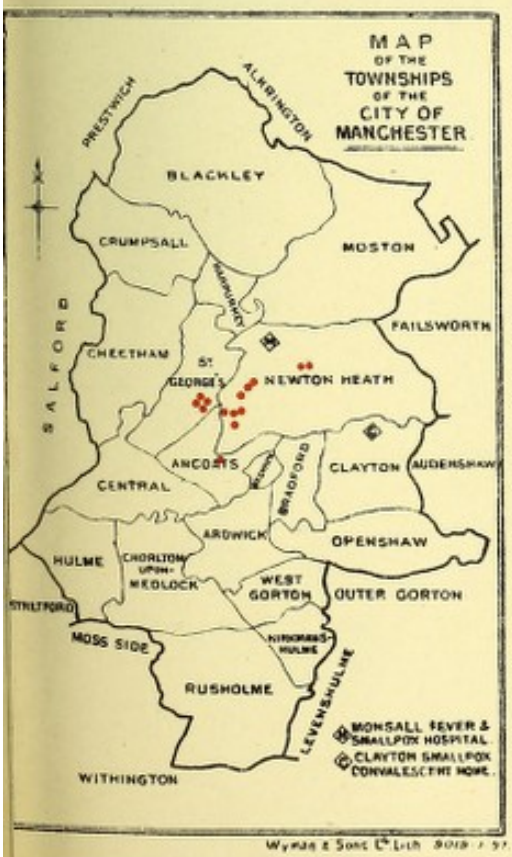
September 1892, 4 weeks ending 1st October.



XI. October 1892, 4 weeks ending 29th October.



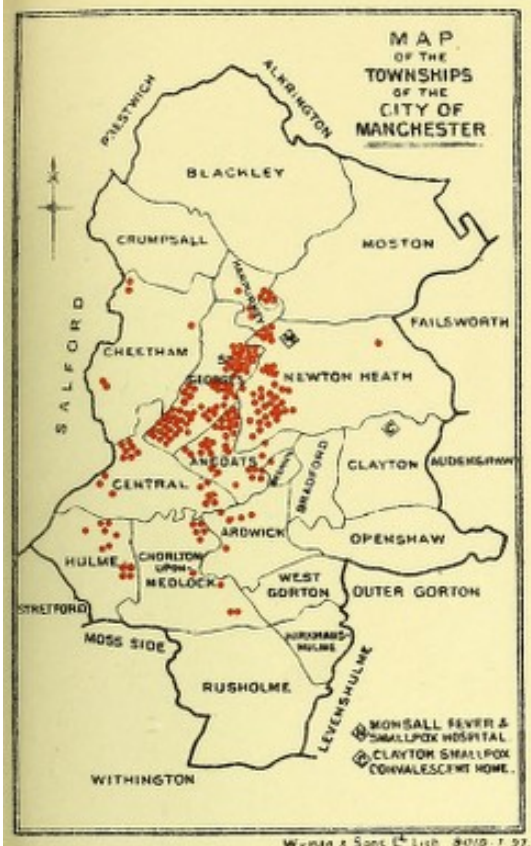
XII. November 1892, 5 weeks ending 3rd December.



XIII. December 1892, 4 weeks ending 31st December.



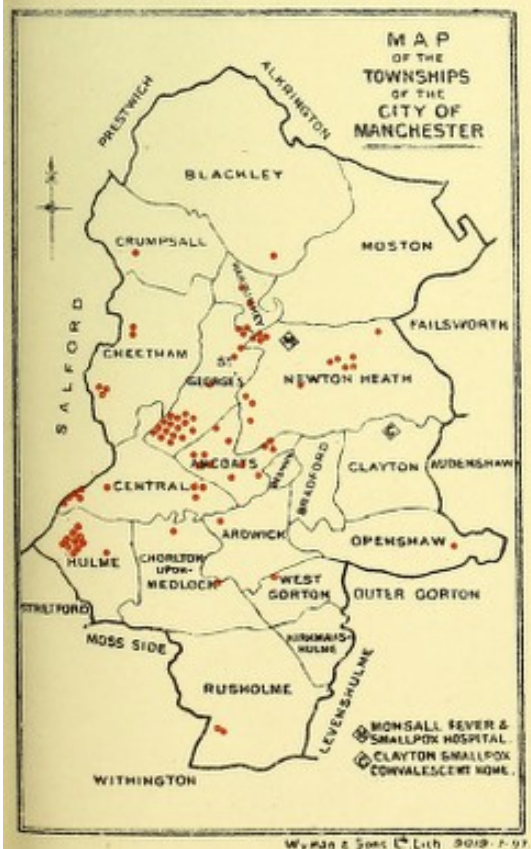
XIV. January 1893, 4 weeks ending 28th January.



XV. February 1893, 4 weeks ending 25th February.



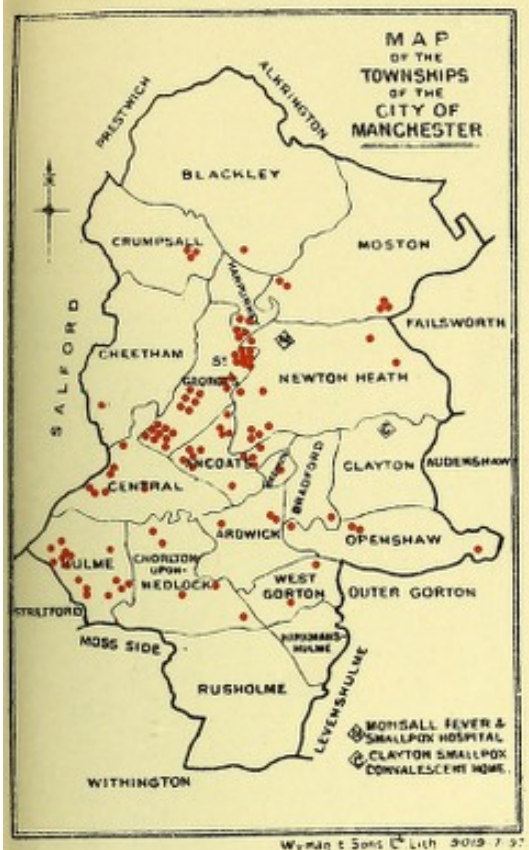
XVI. March 1893, 5 weeks ending 1st April.



XVII. April 1893, 4 weeks ending 29th April.



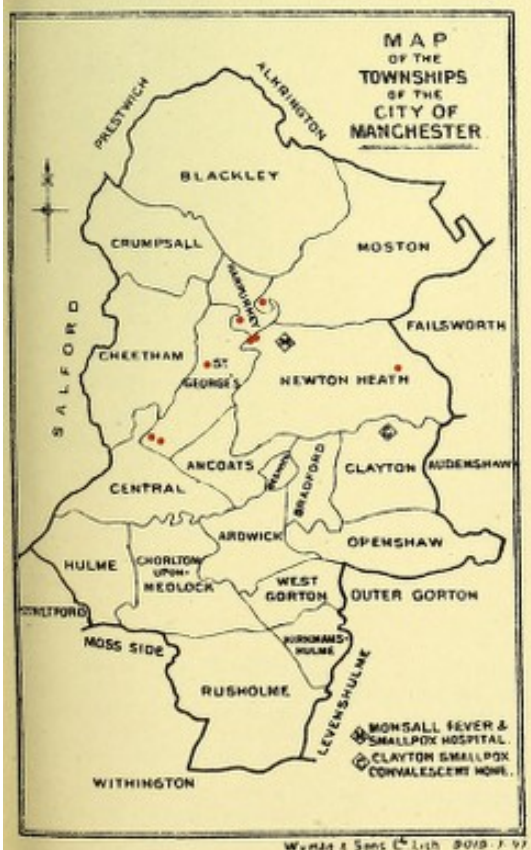
VIII. May 1893, 5 weeks ending 3rd June.



XIX. June 1893, 4 weeks ending 1st July.



XX. July 1893, 4 weeks ending 29th July.



XXI. August 1893, 5 weeks ending 2nd September.



*Small-Pox—Weekly Incidence.**

	Cases notified in Manchester.		Cases admitted into Monsall from Outlying Districts.		Total.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
1892.						
Week ending—						
March 12	1	—	—	—	1	—
„ 19	—	—	1	—	1	—
„ 26	1	—	1	—	2	—
April 2	1	—	—	—	1	—
„ 9	1	—	—	—	1	—
„ 16	1	—	—	—	1	—
* * * * *	*	*	*	*	*	*
Aug. 20	1	—	—	—	1	—
„ 27	1	—	8	—	9	—
Sept. 3	—	—	1	—	1	—
„ 10	1	—	4	1	5	1
„ 17	4	—	1	—	5	—
„ 24	1	—	—	—	1	—
Oct. 1	4	1	2	1	6	2
„ 8	7	—	—	—	7	—
„ 15	3	—	1	—	4	—
„ 22	4	—	—	—	4	—
„ 29	—	—	2	—	2	—
Nov. 5	1	—	—	—	1	—
„ 12	8	—	—	—	8	—
„ 19	1	—	—	—	1	—
„ 26	2	—	—	—	2	—
Dec. 3	2	1	—	—	2	1
„ 10	11	—	—	—	11	—
„ 17	14	—	1	—	15	—
„ 24	19	—	2	—	21	—
„ 31	20	1	1	—	21	1
1893.						
Jan. 7	20	1	—	—	20	1
„ 14	67	7	3	—	70	7
„ 21	47	1	7	—	54	1
„ 28	54	7	8	1	62	8
Feb. 4	42	4	7	—	49	4
„ 11	20	—	1	—	21	—
„ 18	18	3	1	—	19	3
„ 25	30	1	3	—	33	1
March 4	11	—	1	—	12	—
„ 11	23	2	1	—	24	2
„ 18	28	1	1	1	29	2
„ 25	10	—	3	—	13	—
April 1	13	—	3	—	16	—
„ 8	12	3	6	—	18	3
„ 15	20	2	3	—	23	2
„ 22	14	1	—	—	14	1
„ 29	33	1	3	1	36	2
May 6	25	3	—	—	25	3
„ 13	30	—	7	—	37	—
„ 20	22	1	2	1	24	2
„ 27	11	1	3	2	14	3
June 3	13	3	1	1	14	4
„ 10	15	2	1	—	16	2
„ 17	11	1	3	—	14	1
„ 24	8	—	1	—	9	—
July 1	—	—	2	—	2	—
„ 8	1	—	—	—	1	—
„ 15	4	—	1	—	5	—
„ 22	3	1	—	—	3	1
„ 29	—	—	—	—	—	—
Aug. 5	2	1	—	—	2	1
„ 12	1	—	—	—	1	—
	717	50	97	9	814	59

* *See also* Diagram.

It will be seen from the Table of Cases (Appendices VIII. and IX.) that the total number notified in Manchester during the period covered by this report was 723; but of these six proved not to be small-pox after their admission into hospital, viz.:—

2 cases of varicella—one a male æt. 16, one a male æt. 21,
1 case of measles, a female æt. 5,
1 „ syphilis, a female æt. 33,
1 „ phthiriasis, a female æt. 10, and
1 case, a female æt. 13, is recorded as "[illegible] variola."

Then of the 98 cases in the table of those who were admitted into Monsall from districts outside Manchester, one was a case of measles, a female æt. 32.

The total number of cases treated at Monsall was 805, viz., 708 from Manchester, and 97 from districts outside Manchester

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Hospital admissions.

Thus nine of the cases notified in Manchester were not admitted into the hospital. They are as follows:—

—	Date of Notification.	Sex.	Age.	Vaccination.	Result.	Treated.
1	Dec. 26, 1892	F.	27	Vaccinated	Recovered	At home.
2	„ 28, „	M.	30	„	„	Admitted into Belvedere Hospital, Glasgow.
3	Jan. 10, 1893	M.	33	„	„	At home.
4	„ 23, „	F.	5	„	Died	„
5	„ 23, „	M.	44	„	„	„
6	„ 25, „	F.	10 days	"Under" vaccination.	„	„
7	„ 26, „	F.	24	Vaccinated	Recovered	„
8	Feb. 27, „	M.	46	„	„	„
9	May 2, „	F.	75	Vaccination doubtful.	„	„

The following analysis has been made of the cases (805 in number) treated in Monsall Hospital, 514 males, 291 females. Of the males 42 died, or 8 per cent.; of the females, 14 died, or 4·8 per cent.; the mortality on the whole being nearly 7 per cent.

MONSALL HOSPITAL.—CASES OF SMALL-POX.

Age.	Males.		Females.		Total.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Under 1 year	2	1	5	2	7	3
1-5 years	11	4	14	1	25	5
5-10 „	11	—	14	2	25	2
10-15 „	35	1	45	1	80	2
15-20 „	67	2	42	1	109	3
20-30 „	174	7	90	3	264	10
30-40 „	114	13	53	3	167	16
40-50 „	64	9	20	1	84	10
50-60 „	22	4	6	—	28	4
60-70 „	11	1	1	—	12	1
70 and over	1	—	1	—	2	—
Age not ascertained	2	—	—	—	2	—
Total	514	42	291	14	805	56

Type of the disease.

The cases may be divided according to the *type* of the disease as follows:—

——	Cases.	Deaths.
Mild (including varioloid)	171	1
Discrete	396	2
Semi-confluent	70	4
Confluent	134	37
Hæmorrhagic	13	12
Type not stated	21	0
Total	805	56

Age and type.

——	Mild.		Discrete.		Semi-confluent.		Confluent.		Hæmorrhagic.		Type not stated.		Total.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Under 1 year	—	—	4	1	1	—	2	2	—	—	—	—	7	3
1—5 years	—	—	13	1	5	2	7	2	—	—	—	—	25	5
5—10 „	11	—	8	—	1	—	4	2	—	—	1	—	25	2
10—15 „	29	—	24	—	11	—	13	1	1	1	2	—	80	2
15—20 „	33	—	56	—	6	—	12	3	—	—	2	—	109	3
20—30 „	59	1	142	—	18	—	34	7	2	2	9	—	264	10
30—40 „	23	—	82	—	16	1	38	11	4	4	4	—	167	16
40—50 „	8	—	45	—	7	1	20	7	2	2	2	—	84	10
50—60 „	5	—	13	—	3	—	3	2	3	2	1	—	28	4
60—70 „	3	—	6	—	1	—	1	—	1	1	—	—	12	1
70 and over	—	—	1	—	1	—	—	—	—	—	—	—	2	—
Age not stated	—	—	2	—	—	—	—	—	—	—	—	—	2	—
Total	171	1	396	2	70	4	134	37	13	12	21	—	805	56

Or grouped in age-periods:—

	Under 1 Year.		1 to 10 Years.		10 to 30 Years.		30 Years and upwards.		Age not stated.		Total.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Mild	—	—	11	—	121	1	39	—	—	—	171	1
Discrete	4	1	21	1	282	—	147	—	2	—	356	2
Semi-confluent	1	—	6	2	35	—	28	2	—	—	70	4
Confluent	2	2	11	4	59	11	62	20	—	—	134	37
Hæmorrhagic	—	—	—	—	3	3	10	9	—	—	13	12
Type not stated	—	—	1	—	13	—	7	—	—	—	21	—
Total	7	3	50	7	455	15	293	31	2	—	805	56

Turning now to the vaccination conditions, it may be convenient, in the first place, to give the statistics of the vaccination of those individuals in respect to ages, and secondly to combine these results with those above given upon the type of the attack of small-pox.

Vaccination condition of the attacked.

	Vaccinated.		"Under" Vaccination.		Vaccination alleged, but no Evidence.		Vaccination doubtful.		Un-vaccinated.		Total.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Under 1 year	—	—	3	1	—	—	—	—	4	2	7	3
1-5 years	—	—	2	1	—	—	—	—	23	4	25	5
5-10 „	11	—	2	—	1	1	2	—	9	1	25	2
10-15 „	53	—	—	—	2	—	9	—	16	2	80	2
15-20 „	95	1	1	—	1	—	3	—	9	2	109	3
20-30 „	232	4	2	—	5	1	8	—	19	5	264	10
30-40 „	156	13	—	—	—	—	8	2	3	1	167	16
40-50 „	77	7	—	—	3	1	1	—	3	2	84	10
50-60 „	24	3	—	—	1	—	2	1	1	—	28	4
60-70 „	7	—	—	—	—	—	5	1	—	—	12	1
70 years and over	1	—	—	—	—	—	—	—	1	—	2	—
Age not stated	2	—	—	—	—	—	—	—	—	—	2	—
Total	658	28	10	2	11	3	38	4	88	19	805	56

Or grouped in age periods:—

	Under 1 Year.		1 to 10 Years.		10 to 30 Years.		30 Years and upwards.		Age not stated.		Total.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Vaccinated	—	—	11	—	389	5	265	23	2	—	658	28
"Under" Vaccination	3	1	4	1	3	—	—	—	—	—	10	2
"Alleged" „	—	—	1	1	6	1	4	1	—	—	11	3
Doubtful „	—	—	2	—	20	—	16	4	—	—	38	4
Unvaccinated	4	2	32	5	44	9	8	3	—	—	88	19
Total	7	3	50	7	453	15	293	31	2	—	805	56

These figures show that the proportion of the *unvaccinated* under 1 year of age was 57·1 per cent.; at 1 to 10 years, 64 per cent.; 10 to 30 years, 11·6 per cent.; and at 30 years upwards, 3 per cent. Again, as regards mortality, the death-rate amongst the *vaccinated* was 4·2 per cent.; amongst the *unvaccinated* 21·6 per cent., or at different age periods:—

	Vaccinated.	Unvaccinated.
Under 1 year	Nil.	50 per cent.
1 to 10 years	Nil.	15·6 „
10 „ 30 „	1·3 per cent.	20·4 „
30 years and upwards	8·6 „	37·5 „

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The Table of Cases (Appendices VIII. and IX.) also furnishes information upon the quality and number of the marks borne by those patients who had been vaccinated, and a summary of these returns gives us the following facts, which are arranged in tabular form:—

Quality and number of marks.

	Good.								Fair.								Faint or Bad.								Character not stated.								Total.	
	Marks.								Marks.								Marks.								Marks.									
	4 and over.		3.		2.		1.		4.		3.		2.		1.		4.		3.		2.		1.		4.		3.		2.		1.			
	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.
Under 1 year	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1 to 5 years	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5 to 10 „	2	—	4	—	1	—	1	—	—	—	1	—	—	—	—	—	—	—	1	—	1	—	—	—	—	—	—	—	—	—	—	—	11	—
10 to 15 „	10	—	10	—	2	—	5	—	5	—	7	—	6	—	—	—	3	—	2	—	—	—	2	—	1	—	—	—	—	—	—	—	53	—
15 to 20 „	26	—	13	—	16	—	3	—	11	1	6	—	8	—	3	—	—	—	5	—	—	—	2	—	—	—	1	—	1	—	—	—	95	1
20 to 30 „	33	1	40	1	31	—	23	1	19	—	22	—	13	—	11	—	4	—	9	—	16	—	8	1	—	—	—	—	2	—	1	—	232	4
30 to 40 „	1	—	9	—	32	2	19	—	6	—	14	1	29	4	6	—	5	2	15	2	13	—	6	1	—	—	—	—	—	—	1	1	156	13
40 to 50 „	2	—	2	—	18	1	6	1	2	—	7	2	12	—	7	2	4	—	2	—	7	1	7	—	—	—	—	—	1	—	—	—	77	7
50 to 60 „	—	—	—	—	3	—	3	—	—	—	4	—	3	—	2	1	1	1	1	—	3	1	3	—	—	—	1	—	—	—	—	—	24	3
60 to 70 „	—	—	—	—	—	—	2	—	—	—	2	—	1	—	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7	—
70 years and over	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	1	—
Age not stated	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	2	—
Total	74	1	78	1	103	3	63	2	43	1	63	3	72	4	30	3	18	3	36	2	41	2	28	2	1	—	2	—	4	—	2	1	658	28

Thus of 318 at all ages who are stated to have had "good" marks, there died from small-pox 7, or 2·2 per cent.

Of 208 at all ages who are stated to have had "fair" marks, there died from small-pox 11, or 5·3 per cent. (nearly).

Of 123 at all ages who are stated to have had "faint" or "bad" marks, there died from small-pox 9, or 7·3 per cent.

The characters of vaccination scars, no doubt, become less marked with the lapse of years, so that less importance can be attached to the above terms than they would seem to imply. In support of this may be cited the fact that the proportion of "good" marks to the whole number vaccinated at different ages ranges from 72·7 per cent. at age 5 to 10 years, down to 25 per cent. at 50 to 60 years, the intervening periods showing an almost regular decline in this proportion.

Discarding, therefore, any reference to the "quality" of the marks and looking only to their number, it appears that of the whole series:—

136 had 4 marks (and over) with a mortality of 5, or 3·6 per cent.
179 „ 3 „ with a mortality of 6, or 3·3 per cent.
220 „ 2 „ „ „ 9, or 4·1 „
123 „ 1 „ „ „ 8, or 6·4 „

It will, however, be observed that there were no deaths amongst those of this "vaccinated class" below the age of 15, and that indeed no vaccinated child under five years had small-pox, that there was only one death amongst 95 vaccinated persons of age 15 to 20; 4 deaths amongst 232 of ages 20 to 30; 13 deaths amongst 156 of ages 30 to 40; 7 deaths amongst 77 of ages 40 to 50; and 3 deaths amongst 24 of ages 50 to 60.

To put this in another way, we may contrast the death-rates at different age-periods (*a*) amongst the whole number attacked, and (*b*) amongst the vaccinated and (*c*) the unvaccinated. I shall not reckon the mortality of the other classes, viz., those undergoing vaccination, or presenting doubtful or no evidence of it, as that would only needlessly complicate the comparison.

Analysis of Small-pox Deaths.

SMALL-POX.—DEATHS.

	Total Attacked.			Vaccinated Class.			Unvaccinated Class.		
	Cases.	Deaths.	Rate.	Cases.	Deaths.	Rate.	Cases.	Deaths.	Rate.
			Per cent.			Per cent.			Per cent.
Under 1 year	7	3	42·8	—	—	—	4	2	50·0
1 to 10 years	50	7	14·0	11	—	—	32	5	15·6
10 to 30 years	453	15	3·3	380	5	1·3	44	9	20·4
30 years and upwards	293	31	10·5	265	23	8·6	8	3	37·5
Age not stated	2	—	—	2	—	—	—	—	—
Total	805	56	7·0 nearly	658	28	4·2	88	19	21·6

It remains to consider the relation between the *type* of the attack of small-pox and the condition of the subject as to vaccination.

A.—*Vaccinated Class.*

Type.	Below 1 year.		1-5.		5-10.		10-15.		15-20.		20-30.		30-40.		40-50.		50-60.		60-70.		70 years and upwards.		Age not stated.		Total.	
	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	Cases.	Deaths.
Mild	—	—	—	—	10	—	28	—	32	—	56	1	21	—	8	—	5	—	3	—	—	—	—	—	163	1
Discrete	—	—	—	—	—	—	18	—	51	—	136	—	82	—	44	—	12	—	3	—	1	—	2	—	349	—
Semi-confluent	—	—	—	—	—	—	5	—	5	—	15	—	13	1	7	1	2	—	1	—	—	—	—	—	48	2
Confluent	—	—	—	—	1	—	1	—	5	1	17	2	34	10	16	6	3	2	—	—	—	—	—	—	77	21
Hæmorrhagic	—	—	—	—	—	—	—	—	—	—	1	1	2	2	—	—	1	1	—	—	—	—	—	—	4	4
Type not stated	—	—	—	—	—	—	1	—	2	—	7	—	4	—	2	—	1	—	—	—	—	—	—	—	17	—
Total	—	—	—	—	11	—	53	—	95	1	231	4	156	13	77	7	24	3	7	—	1	—	2	—	658	28

The death recorded amongst the "mild" cases was that of a man 28 years of age who was well vaccinated, having "four good marks," and whose attack of small-pox was "highly modified." His death was due to acute tuberculosis and can, therefore hardly be reckoned amongst the small-pox deaths.

As regards the character and number of the vaccination scars, irrespective of the ages of the subjects, we find that of these having—

Analysis of small-pox in the "Vaccinated."

	Good Marks.	Fair Marks.	Faint Marks.	Quality not stated.
A.—Mild attacks (163) *Four (and over)*	39	21	4	1
Three	29	10	4	—
Two	19	15	3	1
One	10	5	2	—
Total	97	51	13	2

Showing a marked preponderance of the better vaccinated amongst this series of cases.

	Good Marks.	Fair Marks.	Faint Marks.	Marks not stated.
B.—Discrete attacks (349). *Four (and over)*	32	13	8	—
Three	35	38	20	1
Two	65	40	24	3
One	39	13	17	1
Total	171	104	69	5

In this series the proportion of these having poor or faint marks is higher than in the preceding.

	Good Marks.	Fair Marks.	Faint Marks.	Marks not stated.
C.—Semi-confluent attacks (48). *Four (and over)*	2	2	—	—
Three	7	8	4	1
Two	4	6	5	—
One	7	1	1	—
Total	20	17	10	1
D—Confluent attacks (77). *Four (and over)*	—	6	5	—
Three	3	6	7	—
Two	11	8	9	—
One	5	9	7	1
Total	19	29	28	1
E.—Hæmorrhagic attacks (4). *Four (and over)*	—	—	—	—
Three	1	—	—	—
Two	—	1	—	—
One	—	1	1	—
Total	1	2	1	—
F.—Type not stated (17). *Four (and over)*	1	1	1	—
Three	3	1	1	—
Two	4	2	—	—
One	2	1	—	—
Total	10	5	2	—

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Or, stated in another way, and irrespective of the "quality" of the marks, we find that of—

136 *having 4 marks:*—
- 65 had mild attacks, or 47·7 per cent.
- 53 „ discrete „
- 4 „ semi-confluent attacks.
- 11 „ confluent attacks, or 8 per cent.
- 3 „ attacks of type not stated.

179 *having three marks:*—
- 43 had mild attacks, or 24 per cent.
- 94 „ discrete „
- 20 „ semi-confluent attacks.
- 16 „ confluent, or 9 per cent.
- 1 „ hæmorrhagic attacks.
- 5 „ attacks of type not stated.

220 *having 2 marks:*—
- 38 had mild attacks, or 17·2 per cent.
- 132 „ discrete „
- 15 „ semi-confluent attacks.
- 28 „ confluent, or 12·7 per cent.
- 1 „ hæmorrhagic attacks.
- 6 „ attacks of type not stated.

123 *having one mark:*—
- 17 had mild attacks, or 13·8 per cent.
- 70 „ discrete „
- 9 „ semifluent attacks.
- 22 „ confluent „ or 17·8 per cent.
- 2 „ hæmorrhagic attacks.
- 3 „ attacks of type not stated.

Lastly, apportioning these cases in the several age-periods to which they belong we get the following table:—

—	Mild.				Discrete.				Semi-confluent.				Confluent.				Hæmorrhagic.				Type not stated.			
	No. of Marks.				No. of Marks.				No. of Marks.				No. of Marks.				No. of Marks.				No. of Marks.			
	4	3	2	1	4	3	2	1	4	3	2	1	4	3	2	1	4	3	2	1	4	3	2	1
5-10 years	2	5	2	1	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—
10-15 „	15	10	3	—	2	6	5	5	—	3	—	2	1	—	—	—	—	—	—	—	1	—	—	—
15-20 „	18	7	5	2	15	14	19	3	2	2	1	—	1	1	—	3	—	—	—	—	1	1	—	—
20-30 „	26	14	10	6	23	44	42	27	2	8	4	1	4	3	4	6	—	1	—	—	1	1	2	3
30-40 „	4	5	9	3	5	19	41	17	—	3	6	4	3	8	16	7	—	—	1	1	—	3	1	—
40-50 „	—	1	6	1	7	6	20	11	—	2	3	2	1	2	7	6	—	—	—	—	—	—	2	—
50-60 „	—	1	2	2	—	3	4	5	—	1	1	—	1	1	1	—	—	—	—	1	—	—	1	—
60-70 „	—	—	1	2	1	1	—	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—
70 years	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Age not stated	—	—	—	—	—	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	65	43	38	17	53	94	132	70	4	20	15	9	11	16	28	22	—	1	1	2	3	5	6	3

Collating these cases into larger groups to facilitate the comparison of the figures we have:—

—	Total Cases.	4 Marks.	3 Marks.	2 Marks.	1 Mark.
Under 10 years of age:—					
Mild attacks	10	2	5	2	1
Confluent „	1	—	1	—	—
At 10 to 30 years of age:—					
Mild attacks	116	59	31	18	8
Discrete „	205	40	64	66	35
Semi-confluent attacks	25	4	13	5	3
Confluent „	23	6	4	4	9
Hæmorrhagic „	1	—	1	—	—
Type not stated	10	3	2	2	3
At 30 years upwards:—					
Mild attacks	37	4	7	18	8
Discrete „	142	13	29	66	34
Semi-confluent attacks	23	—	7	10	6
Confluent „	53	5	11	24	13
Hæmorrhagic „	3	—	—	1	2
Type not stated	7	—	3	4	—
	656	136	178	220	122

And of two cases, the age of which is not stated, both were discrete attacks; one had three marks, the other had one mark.

B.—"*Under*" *Vaccination.*

There were 10 persons attacked with small-pox whilst undergoing primary vaccination, of whom two died, both under five years of age.

Small-pox in those "under" vaccination.

—	Cases.	Deaths.	Below 1 Year.		1 to 5.		5 to 10.		10 to 15.		15 to 20.		20 to 30.	
	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.
Mild	4	—	—	—	—	—	1	—	—	—	1	—	2	—
Discrete	5	1	2	—	2	1	1	—	—	—	—	—	—	—
Semi-confluent	0	—	—	—	—	—	—	—	—	—	—	—	—	—
Confluent	1	1	1	1	—	—	—	—	—	—	—	—	—	—
Total	10	2	3	1	2	1	2	—	—	—	1	—	2	—

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C.—"*Alleged*" *Vaccination.*

Small-pox in those in which vaccination was "alleged."

There were 11 cases in which no evidence of vaccination could be obtained, although it was averred to have been performed in infancy. Of these cases, three were fatal.

——	Cases.	Deaths.	5 to 10.		10 to 15.		15 to 20.		20 to 30.		30 to 40.		40 to 50.		50 to 60.	
			C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	C.
Mild	0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Discrete	1	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—
Semi-confluent	3	—	—	—	1	—	—	—	1	—	—	—	—	—	1	—
Confluent	7	3	1	1	1	—	—	—	2	1	—	—	2	1	—	—
Total	11	3	1	1	2	—	—	—	3	1	—	—	3	1	1	—

D.—"*Doubtful*" *Vaccination.*

Small-pox in subjects of "doubtful" vaccination.

It is noted that vaccination is "uncertain" or "doubtful" in 38 cases, of which 4 were fatal.

——	Cases.	Deaths.	5 to 10.		10 to 15.		15 to 20.		20 to 30.		30 to 40.		40 to 50.		50 to 60.		60 to 70.	
			C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.
Mild	4	—	—	—	1	—	—	—	1	—	2	—	—	—	—	—	—	—
Discrete	16	—	2	—	3	—	3	—	4	—	—	—	—	—	1	—	3	—
Semi-confluent	5	—	—	—	2	—	—	—	1	—	2	—	—	—	—	—	—	—
Confluent	9	1	—	—	3	—	—	—	1	—	3	1	1	—	—	—	1	—
Hæmorrhagic	3	3	—	—	—	—	—	—	—	—	1	1	—	—	1	1	1	1
Type not stated	1	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—
Total	38	4	2	—	9	—	3	—	8	—	8	2	1	—	2	1	5	1

E.—*Unvaccinated Class.*

Small-pox in the Unvaccinated.

Type.	Cases.	Deaths.	Below 1 year.		1 to 5.		5 to 10.		10 to 15.		15 to 20.		20 to 30.		30 to 40.		40 to 50.		50 to 60.		60 to 70.		70 and over.	
			C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.	C.	D.
Mild	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Discrete	25	1	2	1	11	—	5	—	3	—	2	—	2	—	—	—	—	—	—	—	—	—	—	—	—	—
Semi-confluent	14	2	1	—	5	2	1	—	3	—	1	—	1	—	1	—	—	—	—	—	1	—	1	—	—	—
Confluent	40	11	1	1	7	2	2	1	8	1	6	2	14	4	1	—	1	—	—	—	—	—	—	—	—	—
Hæmorrhagic	6	5	—	—	—	—	—	—	1	1	—	—	1	1	1	1	2	2	1	—	—	—	—	—	—	—
Type not stated	3	—	—	—	—	—	1	—	1	0	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	88	19	4	2	23	4	9	1	16	2	9	2	19	5	3	1	3	2	1	—	1	—	1	—	—	—

One of the points of interest from these statistics of the unvaccinated subjects of small-pox is the evidence it affords of the increasing severity (in type) of the disease with increase in the ages of the patients, after the first year of life.

Thus from 1 *to* 10 *years of age*, of 32 cases (5 deaths), no fewer than 16 were discrete, or 50 per cent.

From 10 *to* 30 *years*, of 44 cases (9 deaths), only 7 were discrete, or 15·9 per cent.

Whilst at 30 years and upwards, 8 cases (3 deaths), there were no discrete cases.

Per contra, out of 6 malignant cases (hæmorrhagic), 4 occurred at 30 years and upwards. It is remarkable that one of this class noted as occurring in a female aged 51 (No. 717 in the table) is not recorded as fatal.

Small-pox infection in hospital.

In view of the proximity of the small-pox wards to those devoted to fever cases at Monsall Hospital, it is not surprising that some of the inmates of the latter contracted small-pox.

The following is a list of those cases, seven in number:—

No.	Name.	Sex.	Age.	Disease.	Date of Attack.	Date of Recovery.	Description.	Result.	Remarks.
1	E. C.	F.	—	Scarlet fever	Dec. 27, 1892	Feb. 15, 1893	Confluent	Recovered	Unvaccinated.
2	G. B.	M.	7	" "	April 1, 1893	May 7 "	"	"	?
3	W. H.	M.	49	Cellulitis	Jan. 7 "	Feb. 3 "	Discrete	"	One good mark.
4	R. K.	F.	11	Diphtheria	. .	April 22 "	Mild	"	Three good marks.
5	F. D.	M.	15	Scarlet fever	Nov. 18, 1892	Nov. 30, 1892	Discrete	"	?
6	A. G.	M.	7	" "	Jan. 14, 1893	April 7, 1893	Mild	"	Four good.
7	M. E. M.	F.	6	Measles; pneumonia; varicella.	. .	May 14 "	"	"	Two months before.

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No. 7 was sent into the hospital as a case of variola, and was too ill to vaccinate. She had been successfully vaccinated two months before admission.

At my visit in the latter end of January I called on the Clerks to the Guardians of the three unions of Manchester Township, Chorlton, and Prestwich, Messrs. G. Macdonald, D. S. Bloomfield, and E. W. Ogden, and these gentlemen kindly furnished me with particulars as to public vaccination and re-vaccination, which will be found in the Appendix XI.

On January 13th the Medical Officer of Health issued the following handbill supplementary to one previously in circulation (Appendix X.):—

"Public Health Office,
"Town Hall, Manchester,
"January 13th, 1893.

"RE-VACCINATION.

"The Medical Officer of Health gives notice that small-pox still continues to spread in the city of Manchester, 139 persons having been already attacked since the commencement of December last. He therefore earnestly solicits the attention of proprietors of business establishments, of occupiers of mills, factories, and workshops, and, indeed, of employers of labour generally, to the great importance of their securing for all persons in their employment the protection which is afforded by re-vaccination, against attack by small-pox.

"The recent experience of neighbouring towns shows both the folly and the danger of putting off this protective measure until small-pox has become seriously epidemic; for under these circumstances people give way to panic, and repair to medical men and public vaccinators in such numbers that the requisite supply of vaccine lymph for vaccination cannot be obtained.

"The Medical Officer of Health trusts that you will give him your assistance at the present critical period, by endeavouring to induce all persons with whom you have influence to be re-vaccinated without further delay."

It will be seen from the returns for the Chorlton Union (Appendix XI. (*b*)) and the statements of the public vaccinators of the various districts, that up to that time there had been very little advantage taken of the facilities for public re-vaccination.

CONCLUSIONS.

1. The sanitary organisation in Manchester is, except in one particular, well adapted for coping with epidemic disease. The system of sanitary inspection is thorough and efficient; but it is somewhat anomalous that the department should not be controlled by the Medical Officer of Health.

2. The provision for the isolation of cases of small-pox within the grounds of the Monsall Fever Hospital is not to be commended, and it is to be regretted that the city authorities seem to have been unable to have secured a permanent site for the treatment of small-pox elsewhere. During the epidemic it was found necessary to supplement the accommodation for small-pox by the temporary occupancy of a mill at Clayton Vale.

3. As regards the character of the outbreak, it is noteworthy that of the (completed) cases here recorded, the mortality was exceptionally low, viz., 8 per cent. This fact may be considered in connection with the large proportion of attacks among vaccinated subjects, 658, as compared with those among the unvaccinated, 88, the fatality of the former being 4·2 per cent., of the latter 21·6 per cent.

4. The comparatively small number who sought to be re-vaccinated, notwithstanding the facilities offered, deserves mention.

My best thanks are due to Dr. Tatham for his courteous attention and invaluable assistance.

London, October 15th, 1893. S. C.

LIST OF APPENDICES.

MANCHESTER.

I. *Manchester*—1871-1892. *Annual Rates of Births, Marriages, and Deaths per* 1,000 *of the estimated Population.*
II. *Form to be filled up by the Sanitary Inspector.*
III. *Suggestions by the Medical Officer of Health for the prevention of Infectious Diseases generally.*
IV. *Cautionary circular from Medical Officer of Health to School Authorities.*
V. *Form to be filled up by medical attendant on completion of infectious sickness.*
VI. *Form of certificate of freedom from infection (for school authority).*
VII. *Form sent to Public Libraries (re infectious disease).*
VIII. *Manchester—Small-Pox* 1892–3. *Table of all cases notified to the Sanitary Authority.*
IX. *Table of cases notified as Small-pox admitted into the Monsall Hospital,* 1892–3.
X. *Cautionary hand-bill by Medical Officer of Health re Small-Pox and Vaccination.*
XI. *Returns of Vaccinations at the Public Stations:*
(a.) Township of Manchester.—*Weekly Returns of Vaccinations performed by the Public Vaccinators.*
Return of the Number of Persons vaccinated by the Medical Officers of the Workhouse and the Swinton Schools, and by the Public Vaccinators during the year ended 29th September 1892.
Additional Return of Vaccinations at Workhouse and Swinton Schools.
(b.) Chorlton Union.—*Returns of Vaccination Officers, January 1st to December 31st,* 1891; *and January 1st to June 30th,* 1892.
Additional Returns from Public Vaccinators, January 1893.
(c.) Prestwich Union.—*Vaccination Return of Cheetham and Newton Districts, January 1st to June 30th,* 1892.
XII. Manchester Union—*Vaccination Return,* 1872–1892.

APPENDIX I.

MANCHESTER 1871–1892.—ANNUAL RATES per 1,000 of the estimated Population. N.B.—For the years 1871–90 the Births, Deaths, and Marriages, and their corresponding proportions, are those for the three Unions of Manchester Chorlton, and Prestwich, which have been taken to represent the city approximately. The facts and rates for 1891 and 1892 are those for the existing City of Manchester, as extended by the Act of 1890.—J.W.T.

		Estimated Population.	Annual Rates per 1,000 persons living. Marriages.	Births.	Deaths all Causes.	Small-pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping Cough.	Typhus Fever.	Enteric Fever.	Simple Continued Fever.	Diarrhœa or Dysentery.	Cholera.
Quinquennial Periods.	1871-75	(Mean.) 477,344	24·6	38·9	28·3	0·26	0·64	1·08	0·08	0·78	0·14	0·43	0·21	1·92	0·03
	1876-80	500,802	18·6	38·7	20·2	0·24	0·54	1·07	0·13	0·84	0·08	0·29	0·11	1·22	0·04
	1881-85	542,746	17·9	35·1	23·6	0·04	0·71	0·48	0·10	0·68	0·05	0·20	0·03	0·96	0·03
	1886-90	575,639	16·6	33·4	24·6	0·02	0·83	0·59	0·32	0·54	0·32	0·30	0·01	1·06	0·02
Average 20 years, 1871-90		526,380	19·4	30·5	25·7	0·14	0·68	0·78	0·16	0·71	0·07	0·30	0·09	1·29	0·03
1871		464,866	24·2	38·1	29·3	0·72	0·84	0·71	0·04	0·61	0·20	0·45	0·35	2·58	0·02
1872		471,023	25·8	39·3	27·3	0·32	0·33	1·02	0·09	1·22	0·17	0·40	0·17	2·07	0·04
1873*		477,261	24·8	38·3	28·0	0·08	0·85	1·43	0·05	0·38	0·15	0·46	0·20	1·92	0·05
1874		483,582	23·8	39·3	28·7	0·05	0·62	1·33	0·07	0·83	0·08	0·39	0·19	1·71	0·01
1875		489,987	24·2	39·5	28·4	0·11	0·54	0·92	0·14	0·88	0·11	0·44	0·12	1·32	0·01
1876		496,476	20·2	40·0	28·0	0·80	0·65	1·13	0·10	0·81	0·10	0·42	0·17	1·50	0·02
1877		503,051	19·8	39·5	23·1	0·36	0·30	1·05	0·13	0·84	0·11	0·29	0·12	0·82	0·01
1878		509,714	18·8	39·7	26·8	0·01	0·45	1·07	0·14	0·68	0·05	0·31	0·10	1·42	0·07
1879*		516,464	16·8	37·3	25·2	0·00	0·35	1·07	0·13	1·09	0·02	0·18	0·07	0·62	0·01
1880		523,304	17·2	34·9	25·0	0·01	0·63	1·03	0·14	0·76	0·04	0·26	0·07	1·73	0·09
1881		530,051	17·8	35·9	22·8	0·03	0·29	0·34	0·09	0·71	0·03	0·17	0·06	0·73	0·02
1882		536,924	18·8	35·7	24·0	0·05	0·89	0·34	0·11	0·87	0·10	0·25	0·04	1·09	0·03
1883		542,671	17·8	34·9	24·4	0·01	0·71	0·81	0·11	0·62	0·05	0·20	0·03	0·95	0·03
1884*		549,093	18·0	34·4	23·4	0·01	0·57	0·74	0·08	0·49	0·03	0·19	0·03	1·46	0·05
1885		555,591	17·0	34·8	23·6	0·08	1·08	0·17	0·10	0·71	0·04	0·17	0·01	0·64	0·02
1886		562,165	16·4	34·7	24·1	0·00	0·27	0·41	0·10	0·57	0·03	0·29	0·01	1·34	0·04
1887		568,819	16·6	33·9	25·4	0·01	1·34	0·63	0·25	0·50	0·02	0·31	0·01	1·19	0·02
1888		575,550	16·0	33·3	23·3	0·07	0·27	0·42	0·36	0·79	0·02	0·33	0·02	0·71	0·01
1889		582,362	17·0	33·1	24·2	0·00	1·22	0·45	0·51	0·45	0·01	0·31	0·01	1·00	0·03
1890*		589,253	17·0	31·8	26·2	—	0·83	0·09	0·36	0·37	0·01	0·27	0·02	1·04	0·02
1891		568,673	17·2	33·8	26·0	—	0·43	0·22	0·25	1·02	0·01	0·37	0·01	0·81	0·04
1892		513,196	17·2	33·4	23·2	0·00	0·72	0·27	0·25	0·72	0·00	0·24	0·01	0·79	0·02

* The facts for these years are for 53, instead of 52 weeks; corrections have, therefore, been made in calculating the rates.

MAN-CHESTER.

APPENDIX II.

Copy of Form to be filled up by Sanitary Inspector.

[Recovered.]

SMALL-POX.

Prog. No. _____ Primary—Subsequent.

SANIT. DIST. _____ No. _____

ADDRESS _____

NAME _____ SEX _____ AGE _____

NOTIFIED BY _____ As fit—unfit—for Removal.

NOTIFICATION RECEIVED _____ O'CLOCK _____ 18 ____

Age.		*Small-pox History.	Occupation.	Lodger or Family.	Date of Rash.	Last at School or Work.	Vaccination.		Re-Vaccination.	School or Place of Work.
M.	F.						Date.	Char.		

* A=Has had small-pox, B=Not had it. C=Now ill of small-pox.

INFECTION—SUSPECTED SOURCE _____

CONTACT ON 13th, 14th, 15th DAY BEFORE RASH _____

PREVIOUS CASES (of Small-pox) _____

Other sickness in house or vicinity _____

ISOLATION { GOOD—BAD In living room—bedroom. How long resident here _____
Nursed by _____ Other persons in room _____
Other duties of nurse ? _____

REMOVED TO _____ HOSPITAL _____ O'CLOCK _____ 18 ____

HOUSE _____ Rooms _____ Com. :—Sub-let—Lodging-house. Back-to-back—Through.

Rooms occupied by patient's family. Bed-rooms _____ Living rooms _____ RENT _____

Persons in contact with patient after seizure, namely :—

Schoolmaster written _____ o'clock _____ 189 ____

Library books from _____ Library.

Notice to remove patient given by _____ at _____ o'clock _____ 18 ____.

[Nursed at Home.]

MANCHESTER

Precautions adopted :—

Other inmates _____

Persons in contact _____

Neighbours _____

Employer _____

School _____

House _____

Clothing and bedding _____

Cautionary notices, viz. _____

Date of fumigation _____

Date of stripping _____ Rooms stripped _____

Date of stoving bedding, &c. _____

Confirmatory inspection { Date _____ Result _____

Signed _____

Sanitary Visitor.

APPENDIX III.

City of Manchester.

Directions for Preventing the Spread of Infectious Disease.

The diseases to which these "directions" relate are the *common infectious diseases of childhood*—namely, scarlet fever or scarlatina, diphtheria, typhoid fever, measles, and whooping cough.

(I.) General Precautions against Infection.

As soon as you suspect a child to be sickening with infectious disease, send at once for a doctor, and also communicate with the Medical Officer of Health, through the District Visitor, or the Sanitary Inspector for the district. Should the case turn out to be one or other of *the first three* diseases above named, or should it be small-pox, the doctor will himself report the case to the Medical Officer of Health, and thus save you the trouble.

The first thing to be done is to separate the sick child (or person) from the rest of the family. For his own benefit, as well as for the safety of his friends, the patient should at once be removed to the fever hospital, where he will have every attention and the best possible treatment free of expense.

On application at the Public Health Office, to the District Visitor, or to the Sanitary Inspector, suitable conveyances are at your disposal, without charge, for the removal of patients to hospital, and for the removal of bedding to the disinfecting apparatus for stoving. *On no account* must a patient be removed in a cab or other public conveyance, or you will *incur a heavy penalty*.

In no case must a child from an infected house attend school, or play with children from other houses; nor must any inmate of such house attend church or chapel, or any other public meeting. Visitors or even relatives from other houses must be firmly refused admission to the infected dwelling until disinfection is complete.

(II.) Ventilation of House generally.

Abundance of fresh air should be admitted to every part of a house in which sickness is present, by freely opening doors and windows whenever the weather permits.

Remember that the more frequently and perfectly your house is purified by fresh air, and cleansed with soap and water, the less likely is infection to enter it, or to spread in when once there.

(III.) Precautions in the Sick Room.

If you determine to nurse the patient at home, he must be placed in a bedroom not used by other members of the family.

The sick room which should be large and airy, and preferably on the upper floor, should be cleared of needless furniture, and all curtains, bed-hangings, and carpets.

All drawers and cupboards in the sick room should be emptied of their contents, or the latter will certainly get infected.

In the interests of the patient, it is important that the sick room should be frequented only by the attendants on the sick. Visitors are liable to carry away in their clothing particles of infective matter, and thus to spread disease to other houses.

In scarlet fever, the scales and dust-like powder from the skin are highly infectious.

In scarlet fever, and in diphtheria, discharges from the mouth, ears and nose, are likewise highly infectious; therefore no patient recovering from either of these diseases can safely be allowed to return to school or to mix with other persons (*a*) until the skin has again become quite smooth after completion of the "peeling" process, or (*b*) until all discharges from the mouth, ears, and nose have entirely ceased.

In typhoid (enteric) fever, it is the motions from the bowels that are specially infectious; therefore great care is necessary in their disposal. The motions should be passed into a vessel containing either carbolic acid solution* or solution of sulphate of iron or green copperas,† and immediately afterwards be emptied into the water-closet. Any bedding or linen which may have got soiled with these motions should at once be placed in carbolic solution, and be afterwards cleansed by boiling with soap or soda.

A sheet kept constantly wet with a solution of carbolic acid* or of chloride of lime† should be kept constantly hanging across the doorway in such a way as to prevent the air of the sick room from escaping to other parts of the house.

Fresh air and soap and water are the safest disinfectants to trust to, and these disinfectants should be freely used in the sick room.

An open fire is the best ventilator known; a fairly good one should always be kept burning in the sick room. The

* Strength, half pint to the gallon.
† Strength, one pound to the gallon.

MANCHESTER.

fire causes a draught, which carries up the chimney all the impure air and much of the infective matter in the sick room. In order to admit fresh air, the lower sash (where there is one) of the window should be raised a couple of inches, and the space thus left be closed with a strip of wood, so as to prevent draught. Fresh air will then enter the room between the sashes in such a way as to be harmless to the patient.

(IV.) NECESSITY FOR CLEANLINESS.

In all dealings with the sick, scrupulous attention to cleanliness is essential—in the interest of the patient not less than for the protection of the nurse and of other members of the household.

The following "golden rules" are worth remembering:—

(*a.*) After each attendance on the sick the nurse should carefully wash her hands and face before herself taking food. Where the illness is typhoid fever this precaution is especially necessary;* neglect of it has frequently led to direct infection of a nurse by her patient.

(*b.*) No article of food or of drink which has been in the sick room should ever be partaken of elsewhere; it should be destroyed.

(*c.*) All cups, glasses, plates, spoons, &c., which have been used by the patient should be cleansed with boiling water containing soda before use by other persons.

All bed and body linen, immediately after removal from the sick, should be placed in a solution of carbolic acid, and be afterwards boiled in water containing washing soda.

All discharges from the sick, whether from the mouth, nose, or ears, should be received into a spittoon or other vessel containing solution of carbolic acid.† Small pieces of old rag should be used by the patient instead of sponges or handkerchiefs. The soiled rags should be burnt immediately after use.

Every water-closet used by the sick should be disinfected daily with at least a pint of carbolic acid solution, or of solution of green copperas,‡ and a quantity of the same fluid should be placed in every vessel used for the reception of bowel discharges from the sick.

All books, periodicals, toys, and other articles which have been handled by the sick must be forthwith burnt. On no account should a book be returned to a library, as it is certain to retain infection.

Disinfectants will be supplied gratuitously both by the sanitary inspector and by the district visitor.

JOHN TATHAM, M.D.,
Medical Officer of Health.
Public Health Office, Town Hall, Manchester.

APPENDIX IV.

Circular to School Authorities.

(*Confidential.*)

TOWN HALL, MANCHESTER,
_____ 189 .

DEAR SIR (or MADAM),

THE Sanitary Inspector for your District reports that

_____

is present at _____

which, I am informed, is the Residence of _____

_____

a Pupil in attendance at your School.

Permit me to suggest, in the interest of the Public Health, that you should refuse to receive into your School any Pupils from this address until the house has been certified by me to be free from infection.

I am, yours faithfully,
JOHN TATHAM, M.D.,
Medical Officer of Health.

To the Schoolmaster (or Mistress),
_____ School,

* For the reasons stated in paragraph iii.
† Strength, half pint to the gallon.
‡ Strength, one pound to the gallon.

APPENDIX V.

Form to be filled up by Medical Attendant on completion of Infectious Illness.

CITY OF MANCHESTER.

INFECTIOUS DISEASE.

On the termination of a case of infectious sickness, the Occupier or other person in charge of the premises is requested to obtain from the Medical attendant his signature to the appended Certificate, and to forward it forthwith to the Medical Officer of Health. The Disinfectors will thereupon attend to the case without delay.

[*MEDICAL CERTIFICATE.*]

To the Medical Officer of Health.

Dear Sir,

I am of opinion that it is desirable that the bedding, clothing, and premises of _____

_____ *at No.* _____

_____

should be disinfected forthwith.

Yours, &c.

Signed _____

Address _____

Dated _____ 189 .

APPENDIX VI.

Form of Certificate of Freedom from Infection (for School Authority).

Medical Officer of Health's Department,
Town Hall, Manchester,
_____ 189 .

I hereby certify that the infected bedding, clothing, and apartments of _____

_____ residing at

_____

have been properly disinfected by the officers of this Corporation.

JOHN TATHAM, M.D.,
Medical Officer of Health.

APPENDIX VII.

Form sent to Public Libraries (re *Infectious Diseases*).

Public Health Office,
Town Hall, Manchester.
_____ 18 .

To the Chief Librarian, Reference Library, King Street.

MY DEAR SIR,

INFECTED BOOKS from the _____ LIBRARY.

ON visiting the under-mentioned houses, in consequence of the occurrence therein of dangerous infectious sickness, the Inspectors have found certain books belonging to your Library, which are believed to have been handled by persons in an infective condition.

I therefore communicate the fact to you, in order that you may take steps to prevent the circulation of infected books, and the consequent probable spread of disease amongst future readers.

I am, my dear Sir,
Yours very faithfully,
JOHN TATHAM, M.D.,
Medical Officer of Health.

Address of Infected Houses.	Disease.

APPENDIX VIII.

No.	Sanitary District.	Name.	Sex.	Age.	Notification.	Rash.	Last at School or Work.	Admitted to Hospital.	Discharged from Hospital.	Duration in Hospital.	Type.	Result.	Vaccination.		Re-vaccination.	Source of Infection.	Other Cases.	Remarks. (Probable Source of Infection.)
													Date.	Character.				
					1892.					Days.								
1	Cheetham - -	E. S. - -	F.	19	Mar. 7 -	Mar. 3 -	Feb. 5 -	Mar. 7 -	May 13 -	68	Confluent	Recovered	Uncertain		—	?	None	
2	„ - -	M. T. - -	F.	18	„ 20 -	„ 20 -		„ 20 -	Apr. 22 -	34	Discrete	„	Infancy	2 good	—	Previous case, Mar. 7.	One	
3	Newton Heath -	W. W. -	M.	29	Apr. 1 -	„ 30 -	Mar. 30 -	Apr. 1 -	May 3 -	33	Mild	„	C.	4 „	—	?	None	
4	St. George's - -	T. L. - -	M.	18	„ 6 -	Apr. 5 -	Apr. 2 -	„ 6 -	„ 6 -	31	Discrete	„	C.	3 scars	No	?	„	
5	„ - -	S. E. T. -	F.	5	„ 8 -	„ 6 -	„ 5 -	„ 8 -	„ 10 -	—	—	„	Doubtful if at all			?	„	This was a case of morbilli.
6	Newton - -	B. W. - -	F.	19	„ 13 -	„ 13 -		„ 12 -	„ 3 -	22	Discrete	„	C.	2		Previous case, 1st April.	One	
7	Central - - -	J. I. - -	M.	35	Aug. 17 -	Aug. 13 -		Aug. 17 -	Sept. 30 -	45	„		C.	2 good	Not	. . .	None	Probably Ashton-under-Lyne.
8	Cheetham - -	J. C. - -	M.	56	„ 24 -	Onset Aug. 18, Rash Aug. 27.		„ 24 -	Oct. 14 -	52	Semi-confluent.	„	C.	3 „	„	?	„	Perhaps Warrington.
9	St. George's - -	E. L. - -	M.	28	Sept. 10 -	Sept. 9 -	Sept. 8 -	Sept. 10 -	„ 7 -	28	Discrete	„	C.	2 mod.	„	?	„	
10	Ancoats - -	E. L. - -	F.	33	„ 9 -	„ 5 -		„ 8 -	„ 7 -	30	—	„	C.	4 fair	„	?	„	This was a case of secondary syphilis.
11	St. George's - -	J. C. - -	M.	26	„ 11 -	„ 10 -	„ 8 -	„ 11 -	Nov. 1 -	53	Confluent	„	Unvaccinated		„	?	„	
12	„ - -	J. D. - -	M.	25	„ 13 -	„ 10 -		„ 13 -	Oct. 21 -	39	Discrete	„	C.	2 good	„	. . .	„	Warrington.
13	„ - -	A. P. - -	F.	18	„ 14 -	„ 12 -	„ 10 -	„ 14 -	„ 28 -	45	„	„	C.	3 mod.	„		„	
14	„ - -	K. H. - -	F.	13	„ 16 -	„ 14 -		„ 16 -	„ 18 -	33	Mild	„	C.	4 „	„	?	„	
15	Cheetham - -	W. W. -	M.	51	„ 19 -	„ 18 -	„ 19 -	„ 19 -	„ 10 -	22	„	„	Infancy	1 „	37 years ago.	H.M. Prison	„	Highly modified eruption.
16	Newton Heath -	T. W. - -	M.	34	„ 26 -	„ 23 -	„ 23 -	„ 26 -	„ 25 -	30	Discrete	„	„	2 good	No	?	„	
17	„ -	Rev. J. M. -	M.	26	„ 28 -	„ 28 -		„ 28 -	„ 28 -	31	„	„	„	3 fair		Visiting Monsall Hospital.	„	
18	St. George's - -	E. F. - -	F.	42	„ 29 -	„ 29 -		„ 30 -	Nov. 29 -	30	„	„	„	2 good	„	. . .	„	Nursing small-pox patient at 13, Malton Street.
19	„ - -	B. K. -		29	Oct. 1 -	„ 28 -		Oct. 1 -	„ 8 -	39	Confluent	„	„	4 fair	„	. . .	„	Visiting small-pox patient at 5, Williams Street.
20	„ -	L. H. -	F.	15	„ 2 -	„ 29 -		„ 2 -	„ 4 -	34	Discrete	„	„	2 good	„	. . .	„	Visiting, 10, Malton Street.
21	„ -	M. J. H. -	F.	4	„ 2 -	Oct. 1 -		„ 2 -	Oct. 12	11	Confluent	Died	Unvaccinated			Previous case	One	
22	„ -	J. H. - -	M.	40	„ 2 -	„ 2 -	Oct. 1 -	„ 2 -	Nov. 15 -	45	Discrete	Recovered	Infancy	4 mod.	„	„	Two	
23	„ - -	R. C. H. -	M.	20	„ 2 -	„ 2 -	„ 1 -	„ 2 -	„ 15 -	45	„	„	„	2 good 1 mod.	„	„	Three	
24	Cheetham - -	A. W. - -	F.	51	„ 3 -	„ 2 -		„ 3 -	„ 4 -	33	„	„	„	1 poor	„	„ .	One	
25	„ - -	W. S. - -	M.	34	„ 4 -	„ 4 -	„ 1 -	„ 4 -	Dec. 2 -	60	„	„	„	1 good	Yes (unsuccessful).	„	Two	
26	Newton Heath -	A. C. - -	M.	4	„ 4 -	Sept. 30 -		„ 4 -	Nov. 15 -	43	Confluent	„	Unvaccinated			?	None	
27	St. George's - -	M. B. - -	M.	22	„ 13 -	Oct. 12 -	„ 1 -	„ 13 -	„ 29 -	48	„	„	Infancy	4 fair		. . .	„	Visiting small-pox patient at Wigan.
28	„ - -	S. J. - -	M.	28	„ 12 -	„ 12 -		„ 12 -	„ 8 -	28	Discrete	„		2 good	No	?	„	Admitted in Workhouse, 11th October.

MANCHESTER:

APPENDIX VIII.—*continued.*

No.	Sanitary District.	Name.	Sex.	Age	Notification.	Rash.	Last at School or Work.	Admitted to Hospital.	Discharged from Hospital.	Duration in Hospital.	Type.	Result.	Vaccination. Date.	Vaccination. Character.	Re-vaccination.	Source of Infection	Other Cases.	Remarks. (Probable Source of Infection.)
					1892.			Days.										
29	Newton Heath	W. B.	M.	17	Oct. 15	Oct. 14	Oct. 14	Oct. 15	Dec. 13	60	Confluent	Recovered	Unvaccinated			?	None	
30	Bradford	S. M.	F.	23	„ 17	„ 16	„ 12	„ 17	Nov. 15	30	Discrete	„	Infancy	3 good	No	?	„	
31	Newton Heath	C. B.	M.	32	„ 19	„ 16	„ 14	„ 19	„ 11	24	Mild	„	Doubtful			?	„	
32	„	H. S.	M.	21	„ 21	„ 20	„ 15	„ 21	„ 15	26	„	„	Infancy	4 good	„	*	„	* Small-pox patient removed from Aspell Street.
33	„	F. J.	F.	25	„ 22	„ 19		„ 22	„ 15	25	„	„	„	3 „	„	*	„	* „ „ „
34	„	R. D.	M.	23	Nov. 3	Nov. 3	„ 31	Nov. 3	Dec. 6	34	Discrete	„	„	1 „	„	Previous case	1	
35	St. George's	M. K.	F.	20	„ 6	Oct. 16	Nov. 2	„ 6	„ 2	27	„	„	„	3 mod.		*	None	* Visiting infected house at Failsworth.
36	„	A. H.	F.	29	„ 6	„ 31	Oct. 27	„ 6	Nov. 18	13	„	„	„	3 good		Previous case	1	
37	„	J. H.	M.	31	„ 6	Nov. 1	Nov. 1	„ 6	Dec. 13	38	„	„	„	2 mod.		„	2	
38	„	E. K.	F.	49	„ 6	„ 3	Oct. 17	„ 7	„ 16	40	„	„	„	1 good	„	„	3	
39	Newton Heath	P. S.	M.	25	„ 6	„ 5	Nov. 3	„ 6	„ 13	38	Mild	„	„	4 mod.	„	„	2	
40	„	R. B.	M.	30	„ 8	„ 4	2 months	„ 8	„ 30	53	Semi-confluent.	„	Unvaccinated			?	None	
41	„	J. P.	M.	42	„ 11	„ 9	Nov. 5	„ 11	„ 16	36	Discrete	„	C.	2 mod.		„	„	
42	„	E. P.	F.	14	„ 12	„ 11		„ 12	„ 6	25	Mild	„	C.	3 fair		P. C. 11th Nov.	1	
43	Ancoats	J. W.	M.	24	„ 18	„ 15	„ 12	„ 19	Jan. 13	56	„	„	C.	4 good		?	None	
44	Newton Heath	M. H. P.	F.	16	„ 25	„ 23	„ 25	„ 25	Dec. 29	26	„	„	C.	3 faint		P. C. 12th Nov.	2	
45	„	T. W.	M.	13	„ 26	„ 23	„ 22	„ 25	„ 23	29	Discrete	„	C.	3 „	Not	?	None	
46	„	E. W.	F.	4	„ 29	„ 27		„ 29	Jan. 13	46	„	„	Unvaccinated			?	„	
47	„	E. P.	M.	28	Dec. 1	„ 29	14 days ago	Dec. 1	Dec. 24	24	Mild	Died	C.	4 good		?	„	Highly modified; died from acute tuberculosis.
48	Ancoats	E. W.	F.	20	„ 4	Dec. 1		„ 4	Jan. 13	41	Discrete	Recovered	C.	3 faint	„	*	„	* No. 1, Marcer Street.
49	St. George's	J. J. H.	M.	19	„ 4	„ 2	Dec. 1	„ 4	„ 17	45	„	„	Unvaccinated			*	„	* From Mr. Penfract's, Dale Street.
50	„	A. I.	M.	25	„ 4	„ 3	Nov. 30	„ 4	Feb. 7	66	Confluent	„	C.	4 faint		?	„	
51	Ancoats	T. W.	M.	22	„ 5	„ 5	„ 30	„ 5	„ 3	61	Mild	„	C.	4 fair	„	*	„	*Visited infected house, 1, Marcer Street.
52	Central	W. P.	M.	41	„ 5	„ 3	„ 36	„ 5	Jan. 6	33	Semi-confluent	„	C.	3 „	„	?	„	
53	Newton Heath	E. L.	F.	35	„ 5	„ 2		„ 5	Dec. 27	23	Mild	„	C.	3 faint	„	?	„	
54	St. George's	E. B.	F.	27	„ 6	„ 3		„ 6	„ 27	22	„	„	C.	2 good	„	?	„	
55	Newton Heath	A. B.	M.	38	„ 6	„ 2	Dec. 1	„ 6	Jan. 13	39	Confluent	„	C.	2 faint	„	?	„	
56	Gorton	E. M.	M.	12	„ 6	„ 2	Sept. —	„ 6	Mar. 14	99	„	„	Unvaccinated		„		„	
57	St. George's	I. B.	M.	34	„ 8	„ 4	Dec. 1	„ 8	Jan. 20	44	Discrete	„	C.	1 fair		?	„	
58	„	M. J. T.	F.	47	„ 8	„ 7		„ 8	„ 24	48	Confluent	„	C.	No marks		?	„	
59	Hulme	S. B.	M.	27	„ 11	„ 7	„ 6	„ 11	„ 17	38	Discrete	„	C.	3 fair			„	

APPENDIX VIII.—*continued.*

No.	Sanitary District.	Name.	Sex.	Age.	Notification.	Rash.	Last at School or Work.	Admitted to Hospital.	Discharged from Hospital.	Duration in Hospital.	Type.	Result.	Vaccination.		Re-vaccination.	Source of Infection.	Other Cases.	Remarks. (Probable Source of Infection.)
													Date.	Character.				
										Days.								
60	Newton Heath	J. J.	M.	27	Dec. 12	Dec. 11	Dec. 10	Dec. 12	Jan. 10	30	Discrete	Recovered	C.	4 faint	Not		None.	
61	St. George's	S. A. P.	F.	33	„ 13	„ 5		„ 13	„ 6	25	„	„	C.	3 poor		?	„	
62	„	J. H.	M.	29	„ 15	„ 13		„ 15	„ 27	44	„	„	C.	2 good	„	?	„	*Two days from Saddleworth.
63	Hulme	J. F.	M.	25	„ 15	„ 12	„ 5	„ 15	„ 31	48	Semi-confluent.	„	C.	3 faint	„	?	„	
64	„	J. D.	M.	29	„ 15	„ 11	„ 1	„ 15	„ 27	44	Confluent	„	Unvaccinated			?	„	
65	St. George's	E. Q.	M.	31	„ 16	„ 15		„ 16	Mar. 7	82	„	„	C.	2 fair	Not	*	„	*Cardiff, South Wales.
66	„	R. A. N.	F.	14	„ 16	„ 16		„ 16	Jan. 29	26	Discrete	„	C.	4 good		*	„	*From 4, Tilt Street.
67	Ancoats	E. H.	F.	18	„ 17	„ 16	„ 17	„ 17	„ 29	35	„	„	C.	4 fair		?	„	
68	Central	W. S.	M.	38	„ 17		„ 3	„ 17	„ 31	46	„	„	C.	3 poor	Not			
69	„	W. K.	M.	18	„ 17	„ 16	„ 12	„ 17	„ 31	46	„	„	C.	2 fair	„	?	„	
70	St. George's	J. McC.	M.	29	„ 17	„ 16	„ 15	„ 17	„ 29	35	„	„	Infancy	2 „		*	„	*Brook's Foundry.
71	„	E. G.	M.	40	„ 17	„ 16	„ 15	„ 17	„ 24	29	„	„	„	2 poor		*	„	*4, Tilt Street.
72	Newton Heath	T. T.	M.	33	„ 17	„ 16	„ 16	„ 17	„ 29	35	Confluent	„	„	2 fair	No		„	
73	Central	W. M.	M.	28	„ 18	„ 18	„ 15	„ 18	„ 29	34	Discrete	„	„	2 poor	„		„	
74	„	M. A. W.	F.	13	„ 18	„ 18	„ 16	„ 18	„ 29	34	Mild	„	„	4 good	„	Previous case	1	
75	„	M. O. C.	M.	45	„ 19	„ 17	„ 17	„ 19	„ 24	37	Discrete	„	„	3 poor	„	?	None.	
76	St. George's	G. B.	M.	31	„ 19	„ 17	„ 15	„ 19	„ 15	26	„	„	„	3 fair	„	Previous case	1	
77	„	J. G.	M.	30	„ 19	„ 19	„ 19	„ 24	„ 29	28	„	„	„	2 mod.	„	?	*2	*This case is not connected with the other two.
78	Newton Heath	M. G.	F.	34	„ 19	„ 17	„ 19	„ 19	Mar. 3	73	Confluent	„	„	2 poor	„	?	None.	
79	„	R. P.	M.	21	„ 19	„ 18	„ 15	„ 19	Jan. 24	37	Discrete	„	„	1 good	„	?	„	
80	West Gorton	G. M.	M.	68	„ 19	„ 18	Mar.	„ 19	„ 19	23	Mild	„	„	2 mod.	„	Previous case	1	
81	„	G. M.	M.	33	„ 19	„ 18	Dec. 16	„ 19	„ 31	44	Confluent	„	Unvaccinated		„	„	2	
82	„	G. K.	M.	6	„ 19	„ 19	Nov. 10	„ 19	Mar. 11	83	Discrete	„	„			„	3	
83	„	M. E. K.	F.	7	„ 19	„ 19	„ 10	„ 19	Feb. 24	68	Semi-confluent.	„	„			„	4	
84	„	J. G.	M.	20	„ 19	„ 19	Dec. 15	„ 19	Jan. 29	33	Discrete	„	Infancy	1 poor	No	?	None.	
85	Central	J. C.	M.	17	„ 20	„ 18	„ 19	„ 20	„ 6	18	Mild	„	„	4 mod.	Unsuccessfully.	Previous case	2	(Highly modified)
86	St. George's	J. Y.	M.	25	„ 20	„ 16	„ 13	„ 20	„ 6	18	„	„	„			?	None.	
87	„	S. E. B.	F.	22	„ 21	„ 19		„ 21	„ 13	24	Discrete	„	„	4 poor		Previous case	1	
88	Newton Heath	J. J.	F.	27	„ 22	„ 22		„ 22	„ 10	29	Mild	„	„	1 good	13th Dec. 1 successful.	„	1	(Highly modified).
89	Hulme	W. H.	M.	16	„ 23	„ 23	Sept.	„ 23	Feb. 3	43	Confluent	„	Unvaccinated			*	None.	*Visiting 37, Riga Street.

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Appendix VIII.—*continued.*

No.	Sanitary District.	Name.	Sex.	Age.	Notification.	Rash.	Last at School or Work.	Admitted Hospital.	Discharged from Hospital.	Duration in Hospital.	Type.	Result.	Vaccination. Date.	Vaccination. Character.	Re-vaccination.	Source of Infection.	Other Cases.	Remarks. (Probable Source of Infection.)
										Days.								
	Central	M. H.	F.	71	Dec. 24	Dec. 22	Oct.	Dec. 24	Mar. 18	85	Semi-confluent.	Recovered	Unvaccinated		No	?	None	Visiting 5, Stand Street.
91	Newton Heath	J. A. S.	M.	21	„ 24	„ 24	Dec. 23	„ 24	Jan. 20	28	Discrete	„	Infancy	1 fair	„	?	„	Brook's Foundry.
92	Ancoats	E. D.	F.	30	„ 25	„ 19		„ 25	„ 27	34	„	„	„	3 poor		?	„	
93	West Gorton	E. C. O'K	F.	27	„ 26	„ 24	„ 23						„	2 good		?	„	Visiting of patient at Everton; objected to go to hospital.
94	Hulme	T. G.	M.	33	„ 26	„ 23	20	„ 25	Mar. 28	94	Confluent	„	„	3 poor	„	?	„	
95	„	A. B.	M.	12	„ 26	„ 23	„ 16	„ 26	Jan. 17	23	Mild	„	„	4 fair	„	?	„	From case at 37, Riga Street.
96	„	W. B.	M.	14	„ 26	„ 24	„ 24	„ 26	Feb. 7	44	Discrete	„	„	3 „	„	Previous case	One	
97	„	E. G.	F.	16	„ 27	„ 25	„ 25	„ 26	„ 21	58	Semi-confluent.	„	C.	4 „		?	None	
98	„	H. K.	M.	20	„ 27	„ 23	„ 24	„ 27	Jan. 17	22	Mild	„	C.	1 „		?	Two cases removed from this house Dec. 26.	
99	„	M. H.	F.	33	„ 27	„ 27	„ 26	„ 27	„ 24	29	„	„	C.	2 good		?	None	37 and 39, Riga Street.
100	St. George's	H. R.	M.	51	„ 28	„ 26		„ 28	„ 24	28	Discrete	„	C.	3 poor		?	„	
101	Hulme	S. C.	F.	10	„ 28	„ 24	„ 23	„ 28	„ 17	21	Mild	„	C.	3 fair		?	„	The women from 37, Riga Street.
102	„	J. L.	M.	30	„ 28	„ 25	„ 21	„ 26	Feb. 9	46	—	„				?	„	(Belvidere Hospital, Glasgow; No. 73 in return on Register, Glasgow, J. 20).
103	St. George's	T. H.	M.	30	„ 29	„ 27	„ 24	„ 29	Jan. 20	23	Mild	„	C.	4 good		?	„	From 36, Tilt Street.
104	Newton Heath	K. W.	F.	24	„ 29	1893. Jan. 5		„ 29	Feb. 21	55	„	„	C.	2 „	In four places successful on December 29	Previous case	One	Patient was incubating variola when admitted.
105	Hulme	H. G.	M.	8	„ 29	1892. Dec. 25	„ 23	„ 29	Mar. 2	64	Discrete	„	Unvaccinated			?	None	
106	Newton Heath	F. E.	M.	35	„ 30	„ 28	„ 24	„ 30	Feb. 3	36	Confluent	„	C.	2 faint		?	„	From Brooks, where he is employed.
107	„	J. O.	M.	27	„ 30	„ 28	„ 24	„ 30	Jan. 24	26	Discrete	„	C.	4 fair	Not	?	„	
108	Ancoats	J. D.	M.	17	„ 31	„ 29	„ 29	„ 30	Feb. 3	36	„	„	C.	2 good		?	„	
109	Newton Heath	W. B.	M.	41	„ 31	„ 29	„ 30	„ 31	Jan. 27	28	„	„	C.	2 „		?	„	
110	Hulme	C. H.	M.	18	„ 31	„ 30	„ 29	„ 31	„ 27	28	„	„	C.	4 „		?	„	
111	„	F. M.	M.	23	„ 31	„ 30	„ 24	„ 31	„ 8	9	Confluent	Died	Unvaccinated			?	„	
112	St. George's	J. H.	M.	12	1893. Jan. 1	„ 30	„ 22	Jan. 1	Mar. 2	61	Semi-confluent.	Recovered	„			?	„	
113	„	W. L.	M.	34	„ 2	„ 28	„ 28	„ 2	Jan. 27	26	Discrete	„	C.	3 fair	„	?	„	From stripping the rest.
114	Central	J. T.	M.	29	„ 3	„ 26		„ 3	„ 27	25	Mild	„	C.	2 good	„	?		Leicester.

No.	Sanitary District.	Name.	Sex.	Age.	Notification.	Rash.	Last at School or Work.	Admitted to Hospital.	Discharged from Hospital.	Duration in Hospital.	Type.	Result.	Vaccination.		Re-vaccination.	Source of Infection.	Other Cases.	Remarks. (Probable Source of Infection.)
													Date.	Character.				
115	Central	M. W.	F.	13	Jan. 3	1893. Jan. 3	Dec. 24	Jan. 3	Jan. 20	Days. 18		Recovered	C.	4 fair	Not		One	Margaret Hopwood, removed to Monsall, 24 Dec. 1892. This was not a case of variola.
116	Hulme	T. W.	M.	43	„ 3	1892. Dec. 31	1893. Jan. 2	„ 3	„ 31	29	Discrete	„	C.	1 poor			None	Small-pox next door.
117	St. George's	E. R. R.	F.	16	„ 4	1893. Jan. 3	1892. Dec. 22	„ 4	„ 24	21	„	„	C.	4 good	„	?	„	
118	Newton Heath	C. H. M.	M.	22	„ 4	„ 1	„ 28	„ 4	„ 31	28	„	„	C.	4 „		?	„	
119	„	W. P. R.	M.	22	„ 4	1892. Dec. 31	„ 30	„ 4	Feb. 28	56	Confluent	„	Unvaccinated			?	„	
120	Central	H. W.	F.	10	„ 5	1893. Jan. 4	„ 23	„ 5	Mar. 4	59	Mild	„	Infancy?		Re-vaccinated Jan. 3.	Previous case 3rd Jan.	Two	
121	Chorlton-on-Medlock	J. A.	M.	50	„ 5	1892. Dec. 29	„ 23	„ 5	„ 21	76	Discrete	„	C.	2 poor		?	None	
122	Ancoats	E. B.	F.	25	„ 6	1893. Jan. 4	Aug.	„ 6	Feb. 24	50	„	„	C.	3 good		?	„	
123	St. George's	W. F.	M.	50	„ 6	1892. Dec. 30	Dec. 30	„ 6	Jan. 11	6	Confluent	Died	C.	2 poor		?	„	
124	Cheetham	W. T.	M.	36	„ 6	1893. Jan. 6		„ 6	Feb. 10	36	Discrete	Recovered	C.	3 fair				W. Sharples, Lodging-house, Bolton.
125	Newton Heath	F. C.	M.	30	„ 6	„ 5	Dec. 31	„ 6	„ 10	36	„	„	C.	3 poor		Previous case	One	
126	„	R. G.	M.	14	„ 6			„ 6	Jan. 27	22	„	„	C.	1 good		„		
127	„	A. M. G.	F.	13	„ 6	„ 6	„ 22	„ 6	„ 27	22	Mild	„	C.	3 „		„	Two	
128	Ardwick	R. P.	M.	24	„ 6	„ 1	1893. Jan. 3	„ 6	Feb. 7	33	„	„	C.	4 „	Not	?	None	
129	Ancoats	J. B.	M.	18	„ 7	„ 4	1892. Dec. 31	„ 7	Jan. 31	25	Discrete	„	C.	4	„			8, Ajax Street.
130	Central	H. M.	M.	44	„ 7			„ 7	„ 31	25	„	„	C.	3 poor	„	?		
131	St. George's	T. R.	M.	24	„ 7	„ 6	1893. Jan. 5	„ 9	„ 31	23	„	„	C.	4 good	„	Previous case	One	
132	Harpurhey	H. L.	M.	7	„ 7	„ 6	1892. Dec. 29	„ 7	Mar. 11	64	„	„	C.	?		?	None	
133	Newton Heath	E. D. L.	F.	25	„ 8			8	Feb. 21	45	„	„	C.	2 good	„	?	„	
134	Ancoats	M. A. K.	F.	15	„ 9	„ 8	Sept. —	„ 9	Mar. 11	62	Confluent	„	C.	1 fair	„	?	„	
135	Central	W. J.	M.	44	„ 9			„ 9	Jan. 31	23	Discrete	„	C.	1 poor	„	?	„	
136	St. George's	J. O.	M.	25	„ 9	„ 9		„ 9	Feb. 10	33	„	„	C.	2 „		?	Two	
137	„	S. T.	M.	11	„ 9	„ 9	1892. Dec. 23	„ 9	Mar. 14	65	Confluent	„	Unvaccinated.		„	?	None	
138	Newton Heath	P. S.	M.	41	„ 9	„ 9	1893. Jan. 7	„ 9	Jan. 31	23	Mild.	„	C.	2 good	„	?	„	
139	„	M. J. C.	F.	48	„ 9	„ 9	„ 6	„ 9	Mar. 4	55	Discrete	„	C.	2 fair	„	?	„	
140	Hulme	P. R.	F.	44	„ 9	„ 8	„ 6	„ 9	April 15	97	Confluent	„	Unvaccinated.		„	?	„	
141	Chorlton-on-Medlock	J. M.	M.	22	„ 10	„ 7	1892. Dec. 22	„ 10	Jan. 31	22	Mild		C.	3 good	„	?	„	
142	Ancoats	W. T.	M.	35	„ 10	„ 9	1893. Jan. 5	„ 10	„ 26	17	Confluent	Died	C.	3 poor	„		„	
143	„	R. F.	M.	18	„ 10	„ 9		„ 10	„ 25	16	„	„	C.	4 fair	„			
144	St. George's	W. T.	M.	26	„ 10	„ 10		„ 10	Mar. 3	53	„	Recovered	C.	1 poor	„	?	One	

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Appendix VIII.—*continued.*

No.	Sanitary District.	Name.	Sex.	Age.	Notification.	Rash.	Last at School or Work.	Admitted to Hospital.	Discharged from Hospital.	Duration in Hospital.	Type.	Result.	Vaccination. Date.	Vaccination. Character.	Re-vaccination.	Source of Infection.	Other Cases.	Remarks. (Probable Source of Infection.)
145	Cheadle-on-Medlock	W. J. C.	M.	33	Jan. 10	Jan. 4	1892. Dec. 31			Days.			C.		Not			
146	Newton Heath	T. B.	M.	34	„ 10	„ 9	1893. Jan. 7	Jan. 10	Jan. 15	6	Confluent	Died	C.	4 poor	„		None	
147	„	J. Y.	M.	33	„ 10	„ 9	„ 7	„ 10	„ 15	6	„	„	C.	2 good	„	?	„	
148	St. George's	J. K.	M.	35	„ 10	„ 10		„ 10	Feb. 14	36	Discrete	Recovered	C.	3 poor	„	?	Two	
149	„	D. D.	M.	52	„ 10	„ 10		„ 10	Mar. 28	86	Confluent	„	C.	4 fair	„	?	Three	
150	„	J. D.	M.	10	„ 10	„ 7	1892. Dec. 24	„ 10	Feb. 21	43	Mild	„	C.	4 good	„	?	None	
151	Newton Heath	G. H.	F.	40	„ 10	„ 10	1893. Jan. 7	„ 10	Jan. 19	10	Confluent	Died	C.?	Uncertain	„	?	„	
152	Ancoats	J. A.	M.	10	„ 11	„ 5		„ 10	Mar. 11	61	Mild	Recovered	C.	4 poor	„	?	„	
153	„	J. T.	M.	44	„ 11	„ 10	„ 10	„ 11	Jan. 31	21	Discrete	„	C.	1 good	„	?	„	
154	St. George's	J. H.	M.	18	„ 11	„ 10		„ 10	„ 31	22	Mild	„	Infancy	4 „	No	?	„	
155	Newton Heath	J. B.	M.	23	„ 11	„ 10	„ 9	„ 11	Feb 7	28	„	„	„	4 fair	„	?	„	Case of small-pox at 47, Dale St.
156	Newton Heath	C. H.	M.	30	„ 11		„ 7	„ 11	Mar. 7	56	Discrete	„	„	5 „	„		„	Working on new sheds at Monsall.
157	„	J. B.	M.	22	„ 11	„ 10	„ 7	„ 11	Feb. 10	31	„	„	„	4 good	„	?	„	
158	Ardwick	J. B.	M.	48	„ 11	„ 10	1892. Dec. 31	„ 11	Apr. 14	94	Confluent	„	?	No marks		?	„	
159	Hulme	S. D.	F.	19	„ 11	„ 8		„ 11	Feb. 11	32	Mild	„	Infancy	4 good	„		„	Case at 47, Owen Street.
160	Ancoats	J. P.	M.	20	„ 12	„ 12	1893. Jan. 10	„ 12	„ 28	48	Discrete	„	„	1 very good.	„	?	„	
161	„	H. B.	F.	19	„ 12	„ 10	1892. Dec. 31	„ 12	„ 21	41	„	„	„	4 good	„	?	„	
162	St. George's	J. L.	M.	46	„ 12			„ 12	„ 10	30	„	„	„	4 poor	„	Previous cases	Four	
163	„	M. A. C.	F.	29	„ 12	„ 11		„ 12	„ 11	31	„	„	„	1 good	„	?	None	
164	„	E. P.	F.	34	„ 12	„ 10		„ 12	„ 11	31	„	„	„	1 poor		?	„	
165	„	E. E.	F.	11	„ 12	„ 10	1893. Jan. 6	„ 12	„ 14	34	„	„	„	2 fair	„	?	„	
166	„	J. C.	M.	25	„ 12	„ 10	„ 12	„ 12	„ 30	30	„	„	„	1 good	„	?	„	
167	„	S. M.	F.	27	„ 2	„ 8		„ 12	„ 11	31	„	„	„	2 „	„	?	„	
168	Newton Heath	S. D.	M.	14	„ 12	„ 7	1892. Dec. 20	„ 12	Mar. 7	55	Confluent	„	?	? No marks.		?	„	
169	„	T. P.	M.	44	„ 12	„ 9	1893. Jan. 9	„ 12	Feb. 3	23	Discrete	„	Infancy	2 fair	„	?	„	
170	„	T. C.	M.	42	„ 12	„ 10	1892. Dec. 1	„ 12	„ 7	27	„	„	„	3 good	„	?	„	
171	„	J. O.	M.	34	„ 12	„ 11	10 weeks ago	„ 12	„ 3	23	Mild	„	„	4 fair	„	Previous case	One	
172	St. George's	J. R.	M.	18	„ 13	„ 12	1893. Jan. 11	„ 13	Jan. 31	19	„	„	„	2 good	„			
173	„	S. H. B.	F.	11	„ 13	„ 11	1892. Dec. 22	„ 13	Mar. 11	58	Semi-Confluent.	„	?	? No marks.		?	None	
174	„	J. R.	M.	45	„ 3	„ 13	1893. Jan. 12	„ 13	„ 21	68	Confluent	„	Infancy	2 very good.	„	Previous cases	Two	
175	„	J. S.	M.	9	„ 13	„ 10	„ 9	„ 13	Feb. 11	30	Mild	„	„	4 good	„	?	None	(Highly modified.)

APPENDIX VIII.—*continued.*

No.	Sanitary District.	Name.	Sex.	Age.	Notification.	Rash.	Last at School or Work.	Admitted to Hospital.	Discharged from Hospital.	Duration in Hospital.	Type.	Result.	Vaccination.		Re-vaccination.	Source of Infection.	Other Cases.	Remarks. (Probable Source of Infection.)
													Date.	Character.				
							1892.			Days.								
176	St. George's	J. C.	M.	10	Jan. 13	Jan. 10	Dec. 10	Jan. 13	Feb. 14	33	Mild	Recovered	Infancy	4 fair	No.	?	None	(Highly modified.)
177	„	J. G.	F.	31	„ 13	„ 10		„ 13	„ 11	30	Discrete	„	„	2 very poor.	„	?	„	
							1893.											
178	Cheetham	W. E.	M.	42	„ 13	„ 12	Jan. 10	„ 14	Jan. 19	6	Confluent	Died	„	2 fair	„	- - -	„	Working on new sheds at Monsall.
179	Newton Heath	C. H.	F.	14	„ 13	„ 11	„ 5	„ 13	„ 27	15	Discrete	Recovered	„	3 good	„	?	„	
							1892.											
180	Moston	N. C.	F.	30	„ 13	„ 13	Dec. 27	„ 13	Feb. 14	33	„	„	„	2 „	„	?	„	
							1893.											
181	Hulme	A. T.	F.	29	„ 13	„ 11	Jan. 7	„ 13	„ 21	40	„	„	„	1 very poor.	„	- - -	„	Case at 40, Rira Street.
182	„	A. R.	F.	22	„ 13	„ 10	5 weeks ago	„ 13	Apr. 22	130	Confluent	„	„	1 fair	„	?	„	
183	„	J. E.	M.	26	„ 13	„ 10	Nov. 1892	„ 13	Feb. 10	29	Discrete	„	C.	2 very good.	Not	Previous case	One	
							1893.											
184	„	R. R.	F.	18	„ 13	„ 13	Jan. 11	„ 13	„ 11	30	Mild	„	C.	2 fair	„	„	Two	
185	„	H. T.	M.	27	„ 13	„ 13	„ 12	„ 13	„ 10	29	Discrete	„	C.	3 good	„	„	Three	
186	Ancoats	M. D.	F.	11	„ 14	„ 10	„ 9	„ 14	Mar. 4	50	„	„	C.	1 very good.		?	None	
187	Central	W. H.	M.	30	„ 14	„ 13		„ 13	Apr. 11	89	Confluent	„	C.	2 good		?	„	
188	St. George's	C. C.	M.	29	„ 14	„ 13		„ 14	Jan. 31	18	Discrete	„	C.	3 „		- - -	Five	11, Angel Street.
189	Ancoats	G. E.	M.	42	„ 14	„ 14	„ 11	„ 14	Feb. 3	21	„	„	C.	2 „		?	None	
190	St. George's	H. McC.	M.	36	„ 14	„ 14	„ 11	„ 14	Jan. 16	3	Confluent	Died	C.	2 fair		- - -	Six	11, Angel Street.
							1892.											
191	„	M. S.	F.	20	„ 14	„ 13	Aug.	„ 14	Mar. 18	64	„	Recovered	C. ?	No marks	Not	?	None	
192	„	M. J. A.	F.	30	„ 14	„ 10		„ 14	„ 18	64	Discrete	„	C.	2 fair	„	?	„	
193	„	S. B.	F.	21	„ 14	„ 9		„ 14	Feb. 14	32	„	„	C.	Vaccination uncertain.	„	?	„	
194	Harpurhey	T. G.	M.	31	„ 14	„ 13	10 weeks ago.	„ 14	„ 10	28	„	„	C.	2 very good.	„	?	„	
195	„	F. A. C.	M.	34	„ 14	„ 13	Jan. 12	„ 14	Apr. 14	91	Confluent	„	C.	1 poor	„	?	„	
196	Newton Heath	W. U.	M.	11	„ 14	„ 14	„ 13	„ 14	Mar. 4	50	Mild	„	C.	3 fair		?	„	
197	„	T. McD.	M.	25	„ 14	„ 14	„ 14	„ 14	„ 10	56	Discrete	„	C.	2 very poor.		?	„	
198	„	M. A. T.	F.	26	„ 14	„ 14		„ 14	Feb. 14	32	„	„	C.	1 fair		?	„	
199	„	W. H.	M.	26	„ 14	„ 11	„ 7	„ 14	„ 3	21	„	„	C.	3 very good.		?	„	
200	Ancoats	J. A. B.	F.	22	„ 15	„ 13		„ 15	Mar. 11	56	„	„	C.	4 good		?	„	
201	„	J. W. H.	M.	10	„ 15	„ 11		„ 15	„ 11	56	Semi-confluent.	„	C.	No marks		?	„	
202	St. George's	S. A.	F.	29	„ 15	„ 12	Dec. 24	„ 15	Feb. 21	38	Mild	„	C.	4 fair		?	„	
203	Newton Heath	C. R.	F.	9	„ 15	„ 14	„ 17	„ 15	Mar. 18	63	Discrete	„	Vaccination uncertain.			?	„	
204	„	M. A. T.	F.	13	„ 15	„ 11	Jan. 12	„ 15	Feb. 14	31	„	„	C.	2 fair		?	„	
205	„	J. T.	M.	42	„ 15	„ 14	„ 13	„ 15	Mar. 21	66	Confluent	„	C.	2 „		Previous case		
206	St. George's	J. L.	M.	25	„ 16	„ 16		„ 15	„ 7	32	Discrete	„		2 poor		- - -	Seven	11, Angel Street.

MANCHESTER.

APPENDIX VIII.—*continued.*

No.	Sanitary District.	Name.	Sex.	Age.	Notification.	Rash.	Last at School or Work.	Admitted to Hospital.	Discharged from Hospital.	Duration in Hospital.	Type.	Result.	Vaccination.		Re-vaccination.	Source of Infection.	Other Cases.	Remarks. (Probable Source of Infection.)
													Date.	Character.				
										Days.								
207	St. George's	J. G.	M.	22	Jan. 16	Jan. 16		Jan. 16	Mar. 10	54	Discrete	Recovered		4 good		?	Four	
208	„	A. P.	M.	31	„ 16	„ 14	Jan. 12	„ 16	Feb. 21	37	„	„	C.	3 „		?	None	
209	„	T. P.	M.	32	„ 16	„ 14	„ 8	„ 16	Jan. 31	16	Mild	„	C.	2 fair		?	„	
210	„	D. F.	M.	25	„ 16	„ 15	„ 13	„ 16	Mar. 7	51	Discrete	„	C.	1 poor		?	„	
211	Newton Heath	J. H.	M.	20	„ 16	„ 14	„ 12	„ 16	Feb. 28	44	„	„	Infancy	4 good		?	„	
212	Cheriton-on-Medlock	M. A.	F.	12	„ 16	„ 16		„ 16	Apr. 4	79	Semi-confluent.	„	„	1 „	No	Previous case	One	
213	Hulme	B. G.	F.	24	„ 16	Dec. —		„ 16	Mar. 18	62	Discrete	„	„	3 „	„	. . .	None	Patient came from Barcelona, where small-pox is prevalent.
214	Ancoats	T. McD.	M.	18	„ 17			„ 17	Apr. 11	86	Confluent	„	Unvaccinated				One	
215	St. George's	R. G.	M.	30	„ 17	Jan. 16		„ 16	Feb. 3	19	Mild	„		2 good		Previous case	Nine	
216	„	J. B.	M.	49	„ 17	„ 17	Jan.	„ 17	Mar. 14	57	Discrete	„		2 fair		„	Ten	
217	„	M. J. R.	F.	23	„ 17	„ 15		„ 17	Jan. 19	3	Confluent	Died	Infancy	No marks		?	None	
218	„	F. B.	M.	22	„ 17	„ 17	Jan. 12 1892	„ 17	Feb. 7	22	Mild	Recovered	„	4 very good		Previous case	1	(Highly modified.)
219	Hulme	A. F.	M.	18	„ 17	„ 16	June 6 1893	„ 17	Mar. 21	64	Confluent	„	„	1 poor		?	„	
220	Ancoats	R. B.	M.	24	„ 18	„ 18	Jan. 14	„ 18	„ 30	72	„	„	„	3 fair	14 Jan.	Previous case	„	
221	„	E. A. B.	F.	34	„ 18	„ 18	„ 18	„ 18	May 20	123	„	„	„	5 poor	„	„	2	
222	Central	L. P.	F.	7 weeks	„ 18	„ 15		„ 18	Mar. 11	53	Discrete	„	„	Vaccinated Jan. 7. 1893, successfully in four places		„	1	Vaccinated successfully eight days before eruption.
223	„	S. P.	F.	24	„ 18	„ 17	„ 17	„ 18	„ 11	53	Mild	„	„	4 fair	Jan. 7	„	2	
224	St. George's	E. T.	F.	45	„ 18	„ 13		„ 18	Feb. 21	35	Discrete	„	„	4 poor	No	. . .	None	Visiting at 13, Thorn Street.
225	„	M. A. L.	F.	25	„ 18	„ 17	„ 14	„ 18	„ 21	35	„	„	„	3 good	„	. . .	„	From place of business where two employées have been removed with small-pox.
226	Newton Heath	A. R.	F.	16	„ 18	„ 17	„ 12	„ 18	Mar. 11	53	Mild	„		Vaccinated successfully 10 days before eruption		Previous case	1	Vaccinated successfully 10 days before eruption.
227	Ancoats	A. B.	F.	26	„ 19	„ 19		„ 19	„ 4	45	„	„	„	3 good	14 Jan.	„	3	
228	„	J. C.	F.	18	„ 19	„ 16	Oct.	„ 19	Feb. 21	34	Discrete	„	„	4 „	No	. . .	None	Visiting at 2, Ravenglass Street.
229	Central	W. S.	M.	25	„ 19	„ 18		„ 19	„ 24	37	Mild	„		4 good primary.		?		
230	St. George's	J. D.	M.	34	„ 19	„ 19		„ 19	„ 14	27	„	„	? No marks			Previous cases	11	
231	„	R. M.	M.	17	„ 17	„ 19	Jan. 18	„ 19	„ 24	37	„	„	Infancy	1 good	„	?	None	

APPENDIX VIII.—*continued.*

No.	Sanitary District.	Name.	Sex.	Age.	Notification.	Rash.	Last at School or Work.	Admitted to Hospital.	Discharged from Hospital.	Duration in Hospital.	Type.	Result.	Vaccination.		Re-vaccination.	Source of Infection.	Other Cases.	Remarks. (Probable Source of Infection.)
													Date.	Character.				
										Days.								
232	Newton Heath	R. H.	M.	21	Jan. 19	Jan. 17	Dec. 24	Jan. 19	Feb. 10	23	Mild	Recovered	Infancy	4 good	1888	- - -	None	Visiting at 2, Ravenglass Street.
233	Hulme	C. G.	M.	17	„ 19	„ 17	Jan. 14	„ 19	„ 24	37	Discrete	„	„	2 fair	No	Previous cases.	1	
234	Ancoats	H. B.	M.	32	„ 20	„ 20	„ 14	„ 20	Mar. 21	61	„	„	„	2 „	14 Jan.	„	4	
235	St. George's	F. L.	M.	18	„ 20	„ 19		„ 19	„ 24	65	Semi-confluent.	„	„	4 good		?	None	
236	Cheriton-on-Medlock	F. W.	M.	42	„ 20	„ 19	„ 17	„ 20	„ 7	47	Confluent	„	„	2 fair	No	?	„	
237	Ancoats	J. P. R.	M.	16	„ 21	„ 20	„ 17	„ 21	Feb. 24	35	Discrete	„	C.	1 good		?	„	
238	„	W. A.	M.	16	„ 21	„ 20	„ 17	„ 21	Mar. 24	63	Semi-confluent.	„	C.	3 „		Previous cases	1	
239	„	A. L.	M.	22	„ 21	„ 21	„ 17	„ 21	Feb. 17	28	Mild		C.	1 very good		?	None	
240	Central	R. N.	M.	41	„ 21			„ 20	„ 14	26	„		C.	2 good				
241	„	D. H.	M.	21	„ 21			„ 21	Mar. 7	46	Discrete	„	C.	3 „				
242	St. George's	W. R.	M.	38	„ 21	„ 20	„ 20	„ 21	Feb. 7	18	Mild	„	C.	2 fair		- - -		11, Angel Street.
243	„	H. B.	M.	18	„ 21	„ 21	„ 19	„ 21	Mar. 17	56	Discrete	„	C.	2 good		?	None	
244	Cheetham	R. C.	M.	28	„ 21	„ 20	„ 21	„ 21	„ 7	46	„	„	C.	1 „		- - -		11, Angel Street.
245	Newton Heath	C. S.	F.	16	„ 21	„ 18	„ 16	„ 21	Feb. 21	32	Mild	„	C.	4 fair		?	„	
246	Cheriton-on-Medlock	E. M.	F.	7	„ 21	„ 20	„ 10	„ 21	„ 24	35	„	„	C.	3 very good		- - -	1	James Mottram, removed to Monsall Jan. 10, 1893. From mother.
247	St. George's	M. A. R.	F.	7 days.	„ 22	„ 20		„ 22	Jan. 24	3	Confluent	Died	Unvaccinated			- - -		
248	„	B. C.	F.	25	„ 22	„ 21	2 weeks since	„ 22	Mar. 25	63	„	Recovered	C.	3 good		Previous case	1	
249	„	R. L.	M.	26	„ 22	„ 21	Jan. 21	„ 22	„ 3	41	Discrete	„	C.	2 good		?	None	
250	Newton Heath	H. E. A.	F.	23	„ 22	„ 21		„ 22	Feb. 28	38	„	„	C.	2 „		?	„	
251	Ancoats	G. A.	M.	14	„ 23	„ 22		„ 23	Mar. 24	61	Semi-confluent.	„	C.	3 fair		Previous case	2	
252	„	J. A.	M.	12	„ 23	„ 22	„ 10	„ 23	Feb. 28	37	„	„	C.	3 good		„	3	
253	St. George's	C. G.	F.	30	„ 23	„ 21	„ 21	„ 23	Mar. 18	55	Discrete	„	C.	4 fair		?	None	
254	„	E. D.	F.	5	„ 23	„ 23	Dec. 23					Died	C.			Previous case	4	Body removed to Oldham Road Mortuary.
255	„	T. D.	M.	11	„ 23	„ 23	„ 23	„ 23	Feb. 14	23	Mild	Recovered	C.	4 good		„	3	(Highly modified.)
256	„	M. A. H.	F.	19	„ 23	„ 20	Jan. 19	„ 23	Mar. 18	55	Discrete	„	Uncertain			?	None	
257	„	J. L.	M.	44	„ 23	„ 18	Dec. 21					Died	C.	3 good	Not	?	„	
258	Newton Heath	S. T.	M.	33	„ 23	„ 21	Jan. 17	„ 23	Feb. 21	30	Mild	Recovered	C.	2 very good.	„	?	„	
259	Moston	E. K.	F.	29	„ 23	„ 22		„ 23	Mar. 18	55	Discrete	„	C.	1 good		Previous case	1	
260	„	G. K.	M.	3	„ 23	„ 21		„ 23	„ 18	55	„	„	Vaccinated for first time successfully in four places, 17 Jan. 1893.				2	Vaccinated first time, 7th Jan. 1893.
261	Ardwick	F. R.	M.	20	„ 24	„ 23	3 months	„ 23	„ 7	44	„	„	C.	3 good		Previous case	1	

MANCHESTER.

APPENDIX VIII.—*continued.*

No.	Sanitary District.	Name.	Sex.	Age.	Notification.	Rash.	Last at School or Work.	Admitted to Hospital.	Discharged from Hospital.	Duration in Hospital.	Type.	Result.	Vaccination.		Re-vaccination.	Source of Infection.	Other Cases.	Remarks. (Probable Source of Infection.)
													Date.	Character.				
										Days.								
262	Ancoats	T. McL.	M.	25	Jan. 24	Jan. 23	Jan. 19	Jan. 24	Feb. 24	32	Mild	Recovered	C.	2 very poor.		?	None	
263	Newton Heath	M. H.	F.	24	„ 24	„ 23	„ 23	„ 24	Mar. 4	40	„	„	C.	4 good	7th Jan. 1893.	Previous case	1	
264	Central	E. S.	F.	19	„ 25	„ 20	„ 21	„ 26	Feb. 24	30	Discrete	„	C.	3 fair		?	None	
265	„	T. S.	M.	53	„ 25			„ 25	Mar. 14	49	„	„	Uncertain	No marks		?		
266	St. George's	F. C.	M.	15	„ 25	„ 24		„ 25	„ 17	52	„	„	C.?	„			None	
267	„	T. O.	M.	29	„ 25	„ 25		„ 25	Feb. 14	21	Mild	„	C.	3 fair		?	4	
268	Newton Heath	M. Y.	F.	32	„ 25	„ 24	„ 21	„ 25	April 1	67	Confluent	„	C.	„		?	None	
269	„	J. T. McD.	M.	18	„ 25	„ 24	„ 23	„ 25	Mar. 3	38	Mild	„	C.	2 good		Previous case	1	
270	„	E. B.	F.	16	„ 25	„ 24		„ 25	Feb. 24	31	„	„	C.	2 fair		„	1	
271	Moston	N. K.	F.	3	„ 25	„ 25		„ 25	April 4	70	Confluent	„	Unvaccinated			„	3	
272	„	A. C.	F.	10 days.	„ 25	?						Died	Jan. 19			Mother	1	
273	Ancoats	M. M. A.	F.	8	„ 26	„ 26		„ 26	Feb. 3	9	„	„	C.	No marks	24th Jan. 1893.	Brother	3	
274	„	L. F.	F.	6	„ 26	„ 25	„ 20	„ 26	Mar. 18	52	Mild	Recovered	C.	2 good		- - -		From 89, Naylor Street, or 11, Prior Street.
275	Central	J. P.	F.	19	„ 23	„ 25		„ 26	„ 14	48	„	„	C.	3 „	21st Jan. 1893, successfully.	Previous case	3	
276	St. George's	T. H.	M.	33	„ 26	„ 25		„ 25	„ 7	42	„	„	C.	2 very good.		- - -	None	9, Mill Street.
277	„	J. P.	M.	11	„ 26	„ 25	„ 10	„ 26	„ 17	51	Discrete	„	Uncertain			Previous case	1	
278	Beswick	M. J. P.	F.	38	„ 26	„ 23	„ 20	„ 26	„ 11	45	„	„	C.	2 good		?	None	
279	Ardwick	T. G.	M.	15	„ 26	„ 25	„ 20	„ 26	Feb. 17	23	„	„	C.	3 fair		?	„	
280	Chorlton-on-Medlock	J. B.	M.	21	„ 26	„ 26	„ 23	„ 26	„ 17	23	Mild	„	C.	3 good		- - -	None	Todmorden.
281	„	A. C.	F.	24	„ 26	„ 23							C.		Yes	Previous case	1	
282	Ancoats	W. A.	M.	44	„ 27	„ 26	„ 26	„ 27	April 4	68	Confluent	Recovered	C.	1 fair	1873	„	4	
283	„	W. J. F.	M.	39	„ 27	„ 23	„ 27	„ 27	Feb. 21	26	Mild	„	C.	2 good		„	1	
284	„	A. W.	M.	30	„ 27	„ 26	„ 21	„ 27	April 7	71	Discrete	„	C.	1 poor		?	None	
285	St. George's	T. C.	M.	27	„ 27	„ 27	„ 21	„ 27	Feb. 28	33	„	„	C.	2 good		11, Angel Street	12	
286	„	A. L.	M.	30	„ 27	„ 27		„ 27	Mar. 7	40	„	„	C.	2 fair			6	
287	„	J. A.	M.	17	„ 27	„ 25	„ 26	„ 27	„ 14	47	„	„	C.	2 very good		Previous case	1	
288	„	E. A.	F.	5 weeks	„ 27	„ 25		„ 27	„ 18	51	„	„	Vaccinated successfully Jan. 19, 1893.		Not	„	1	Vaccinated Jan. 19, 1893, successfully in four places; eruption Jan. 26, 1893.
289	Cheetham	A. K.	M.	22	„ 27	„ 26	2 weeks	„ 27	Feb. 4	9	Confluent	Died	Unvaccinated		„	?	None	
290	Newton Heath	F. H.	F.	20	„ 27	„ 26	Jan. 25	„ 27	Mar. 4	37	Discrete	Recovered	C.	2 poor		Previous case	1	

APPENDIX VIII.—*continued.*

No.	Sanitary District.	Name.	Sex.	Age.	Notification.	Rash.	Last at School or Work.	Admitted to Hospital.	Discharged from Hospital.	Duration in Hospital.	Type.	Result.	Vaccination.		Re-vaccination.	Source of Infection.	Other Cases.	Remarks. (Probable Source of Infection.)
													Date.	Character.				
										Days.								
291	Newton Heath	M. H.	F.	15	Jan. 27	Jan. 27	Jan. 24	Jan. 27	Mar. 11	44	Mild	Recovered	C.	4 fair cicatrices.		Previous case.	2	
292	Chorlton-on-Medlock	H. M.	F.	17	„ 27	„ 26	„ 10	„ 27	Feb. 24	29	„	„	C.	3 fair	Jan. 25, 1893, unsuccessfully.	„	2	
293	Ancoats	B. H.	F.	13	„ 28	„ 26	„ 14	„ 28	Mar. 25	57	Confluent	„	C.	No marks		Brother	1	
294	St. George's	J. M.	M.	69	„ 28	„ 27		„ 27	„ 7	40	Discrete	„	C.	„		11, Angel Street	14	
295	„	P. C.	M.	27	„ 28	„ 27		„ 27	April 4	68	„	„	C.	3 good		„	13	
296	„	A. B.	M.	35	„ 28	„ 28		„ 28	Feb. 24	28	„	„	C.	1 „		„	15	
297	„	J. S.	M.	24	„ 28	„ 28		„ 28	Mar. 21	53	Confluent	„	C.	1 fair		?	None	
298	„	M. H. S.	F.	28	„ 28	„ 28		„ 28	Feb. 1	15	Hæmorrhagic.	Died	C.	3 good		Brother	2	Premature labour.
299	„	T. G.	M.	24	„ 28	„ 27	„ 25	„ 28	„ 21	25	Mild	Recovered	C.	„		?	None	
300	Cheetham	J. R. P.	M.	20	„ 28	„ 27	6 weeks ago.	„ 28	„ 21	25	Discrete	„	C.	2 very poor		?	„	
301	Ardwick	W. A.	M.	28	„ 29	„ 27	Jan. 26	„ 28	Mar. 7	39	„	„	C.	3 good		?	„	
302	Central	G. H.	M.	26	„ 30			„ 28	Feb. 24	28	Mild	„	C.	2 fair		?	„	
303	Ancoats	W. M.	M.	5	„ 29	„ 28	„ 27	„ 29	Mar. 28	59	„	„	C.	1 good		?	„	
304	Central	E. A. B.	F.	34	„ 29	„ 29	„ 26	„ 29	„ 3	34	Discrete	„	C.	2 „		?	„	
305	St. George's	J. F.	M.	27	„ 29	„ 29		„ 29	„ 14	45	„	„	C.	1 „		11, Angel Street	16	
306	„	J. H. C.	M.	28	„ 29	„ 28	„ 23	„ 29	Feb. 24	27	„	„	C.	3 „		?	None	
307	Newton Heath	M. D.	F.	36	„ 29	„ 28		„ 29	Mar. 25	56	„	„	C.	2 very faint		?	„	
308	Moston	H. K.	M.	1½	„ 29	„ 27		„ 29	Jan. 31	3	„	Died	Unvaccinated		24 Jan 1893.	Previous case	4	
309	Ancoats	M. C.	F.	24	„ 30	„ 28	„ 25	„ 30	Mar. 4	34	„	Recovered	C.	4 fair		- - -	None	73, Sycamore Street.
310	Central	A. H.	M.	35	„ 30	„ 29	„ 29	„ 30	Feb. 28	30	„	„	C.	2 „		?	„	
311	„	W. E.	M.	32	„ 30	„ 30	„ 28	„ 30	„ 24	26	„	„	C.	2 fair		?	None	
312	St. George's	W. E.	M.	30	„ 30	„ 30	„ 28	„ 30	„ 8	10	Confluent	Died	C.	3 „		11, Angel Street	17	
313	„	J. H.	M.	60	„ 30	„ 31		„ 30	„ 1	3	Hæmorrhagic.	„	No marks			„	18	
314	„	E. A. C.	F.	23	„ 30	„ 29	„ 28	„ 30	Mar. 4	34	Mild	Recovered	C.	4 very good.		?	None	
315	„	E. C.	F.	21	„ 30	„ 28		„ 30	April 15	76	Semi-confluent.	„	C.	4 very good.		?	„	
316	Newton Heath	F. R.	M.	1 7/12	„ 30	„ 14		„ 30	Mar. 18	48	Discrete	„	Unvaccinated			?	„	
317	„	E. R.	F.	9	„ 30	„ 25	„ 20	„ 30	„ 3	33	„	„	„			Brother	1	
318	„	M. R.	F.	7	„ 30	„ 28	„ 23	„ 30	„ 18	48	„	„	„			Sister	2	
319	Rusholme	P. T.	M.	41	„ 30	„ 29	„ 27	„ 30	„ 14	44	Semi-confluent.	„	C.	1 very good.		?	None	

APPENDIX VIII.—*continued.*

No.	Sanitary District.	Name.	Sex.	Age.	Notification.	Rash.	Last at School or Work.	Admitted to Hospital.	Discharged from Hospital.	Duration in Hospital.	Type.	Result.	Vaccination. Date.	Vaccination. Character.	Re-vaccination.	Source of Infection.	Other Cases.	Remarks (Probable Source of Infection.)
										Days.								
320	Hulme	M. T.	F.	24	Jan. 30	Jan. 29		Jan. 30	Mar. 25	55	Confluent	Recovered	C.	No marks			None	Visited house in which small-pox had been.
321	Ancoats	R. M.	M.	34	„ 31	„ 30	Jan. 30	„ 31	„ 7	36	Discrete	„	C.	1 fair		Previous case	1	
322	„	W. T.	M.	28	„ 31	„ 30	„ 28	„ 31	„ 17	46	Semi-confluent.	„	C.	No marks		25, Sycamore St.	None	
323	„	J. C.	F.	28	„ 31	„ 30		„ 31	Feb. 24	25	Discrete	„	C.	2 good			„	5 cases at No. 205.
324	„	M. A. G.	F.	29	„ 31	„ 29	„ 28	„ 31	April 1	61	„	„	C.	2 faint			„	8, Coronation Square.
325	Central	T. McG.	M.	19	„ 31	„ 31	„ 28	„ 31	Mar. 24	53	Confluent	„	C.	1 „		?	„	
326	St. George's	C. D.	F.	27	„ 31	„ 30		„ 31	„ 4	33	Mild	„	C.	3 good			„	
327	„	M. A. C.	F.	11	„ 31	„ 30		„ 31	April 1	61	Confluent	„	Unvaccinated			?	„	
328	Newton Heath	M. C. J.	F.	28	„ 31	„ 28	1892. Dec. 24	„ 30	Mar. 4	33	Discrete	„	C.	2 good		?	„	
329	„	L. P.	F.	17	„ 31	„ 28	1893. Jan. 28	„ 31	Feb. 21	22	Mild	„	C.	3 „		?	„	
330	„	H. C.	M.	19	„ 31	„ 30	„ 28	„ 31	Mar. 17	46	Discrete	„	C.	4 „		?	„	
331	St. George's	T. B.	M.	25	Feb. 1	Feb. 1		Feb. 1	„ 14	42	Confluent	„		2 faint		?	„	
332	„	H. G.	M.	1 7/12	„ 1	Jan. 27		„ 1	Feb. 24	24	—	„	C.	1 „		?	„	This was a case of varicella.
333	Newton Heath	W. H.	M.	14	„ 1	Feb. 1	„ 28	„ 1	Mar. 30	58	Confluent	„	Unvaccinated			Previous case	1	
334	Ancoats	W. H. K.	M.	17	„ 2	Jan. 31	„ 28	„ 2	Feb. 27	26	„	Died		„		?	None	
335	Central	J. H.	M.	33	„ 2			„ 2	Mar. 14	41	Discrete	Recovered	C.	2 good				
336	St. George's	C. K.	M.	38	„ 2	Feb. 1		„ 2	„ 21	48	„	„	C.	1 „		11, Angel Street	19	
337	„	J. H.	M.	57	„ 2	„ 2		„ 2	Feb. 28	27	Mild	„	C.	1 faint		„	20	
338	„	J. L.	M.	38	„ 2	„ 2		„ 2	May 23	111	Confluent	„	No marks			„	21	
339	„	J. M.	M.	30	„ 3	„ 3		„ 3	Mar. 28	54	Semi-confluent.	„	C.	2 faint		?	None	
340	Newton Heath	J. W.	M.	22	„ 3	„ 1	Jan. 28	„ 3	April 4	61	Confluent	„	Unvaccinated			Monsall Hospital	„	
341	Bradford	E. G.	F.	3	„ 3	„	Dec. 18	„ 3	„ 29	86	Semi-confluent.	„		„		?	„	
342	Chorlton-on-Medlock	J. H. M.	M.	35	„ 3	„ 3	Jan. 31	„ 3	Mar. 17	48	Discrete	„	C.	1 fair			None	
343	Newton Heath	S. J. S.	F.	43	„ 4	„ 1		„ 4	„ 11	36	Mild	„	C.	2 „		?	„	
344	„	S. O.	F.	44	„ 5	„ 4	Feb. 2	„ 5	„ 25	49	Semi-confluent.	„	C.	2 faint		18, Oram Street	„	
345	Central	T. C.	M.	32	„ 6			„ 6	„ 7	30	Discrete	„	C.	1 good		?		
346	„	J. L.	M.	42	„ 6	„ 4		„ 6	„ 10	33	„	„	C.	2 poor				Had slept in the streets three nights previous.
347	St. George's	A. H.	M.	1½	„ 6	„ 6		„ 6	„ 25	48	„	„	Unvaccinated			?	„	
348	„	H. McA.	M.	61	„ 6	„ 6		„ 6	„ 10	33	„	„		?		?	„	
349	Newton Heath	A. M.	F.	14	„ 6	„ 5		„ 6	April 1	55	Semi-confluent.	„	Unvaccinated				„	2, Ravenglass Street.
350	Central	A. M.	M.	25	„ 7	„ 7		„ 7	Mar. 7	29	Mild	„	C.	4 good		?	„	(Highly modified.)

APPENDIX VIII.—*continued.*

No.	Sanitary District.	Name.	Sex.	Age.	Notification.	Rash.	Last at School or Work.	Admitted to Hospital.	Discharged from Hospital.	Duration in Hospital.	Type.	Result.	Vaccination.		Re-vaccination.	Source of Infection.	Other Cases.	Remarks. (Probable Source of Infection.)
													Date.	Character.				
										Days.								
351	St. George's	J. H.	M.	24	Feb. 7	Feb. 7		Feb. 7	Mar. 17	39	Mild	Recovered	C.	4 good		?	None	
352	Cheetham	R. J.	M.	54	„ 8	„ 6	Feb. 5	„ 8	„ 10	31	Discrete	„	C.	3 mod.		?	„	H.M.P. Strangeways (warder).
353	Newton Heath	S. A. H.	F.	28	„ 8	„ 7	„ 7	„ 8	„ 11	32	„	„	No marks			- - -	„	5, Ravenglass Street.
354	„	R. V.	M.	24	„ 8	„ 8	Month ago	„ 8	„ 14	35	„	„	C.	2 poor		?	„	
355	Ancoats	T. H.	M.	24	„ 10			„ 10	„ 7	26	„	„	C.	3 very fair		?	2	
356	„	A. McL.	F.	26	„ 10	„ 10		„ 10	„ 18	37	„	„	C.	3 good		Previous case	1	
357	St. George's	M. M.	F.	25	„ 10	„ 9		„ 10	„ 18	37	„	„	C.	4 mod.		?	None	
358	Beswick	H. P.	M.	8	„ 10	„ 7	Jan. 26	„ 10	„ 14	33	Mild	„	C.	3 good	Twice since, but did not take.	Previous case	1	
359	Ancoats	S. B.	F.	69	„ 11	„ 11	Feb. 5	„ 11	„ 11	29	„	„	C.	1 mod.		?	None	
360	Central	A. G.	F.	13	„ 11	„ 10	„ 8	„ 11	„ 25	43	„	„	C.	4 faint		?	„	
361	„	E. G.	M.	15	„ 11	„ 11	„ 10	„ 11	„ 17	35	Discrete	„	C.	3 „		Sister	1	
362	St. George's	J. C.	M.	19	„ 11	„ 11		„ 11	„ 17	35	„	„	C.	4 good		?	None	
363	Newton Heath	M. P.	F.	11	„ 12	„ 11	„ 9	„ 12	Feb. 21	10	Confluent	Died	Unvaccinated			Previous case	1	
364	Ancoats	J. R.	M.	44	„ 13	„ 12	„ 9	„ 13	Mar. 17	33	Discrete	Recovered	C.	2 mod.		„	1	
365	Central	H. R.	M.	38	„ 13	„ 13		„ 13	„ 14	30	„	„	C.	4 faint		?	None	
366	„	S. C.	M.	28	„ 13	„ 12	„ 9	„ 13	„ 24	40	„	„	C.	1 mod.		?	„	
367	Crumpsall	J. L.	M.	42	„ 13	„ 13		„ 13	„ 14	30	„	„	C.	2 good		- - -		Hurst, who died at Monsall Hospital.
368	Central	E. H.	M.	17	„ 14	„ 14	„ 11	„ 14	„ 21	36	„	„	C.	3 faint		Previous case	1	
369	St. George's	H. R.	M.	30	„ 14	„ 14		„ 14	Apr. 14	60	Semi-confluent.	„	C.	3 fair		?	None	
370	Crumpsall	W. G.	M.	27	„ 14			„ 13	Feb. 24	12	Confluent	Died	Unvaccinated			?	„	
371	West Gorton	J. B.	M.	62	„ 14	„ 13	5 years ago	„ 14	Apr. 18	64	„	Recovered	Uncertain		Not	?	„	
372	Ancoats	J. T.	M.	29	„ 15			„ 15	Mar. 24	38	Discrete	„	C.	2 fair		- - -	3	R. Massey, removed to M. 31.
373	St. George's	J. G.	M.	37	„ 15	„ 14	Feb. 11	„ 15	May 12	87	Confluent	„	C.	1 fair		?	None	
374	Harpurhey	J. H. B.	M.	36	„ 15	„ 13	„ 10	„ 15	Mar. 17	31	Discrete	„	C.	2 „	Not	?	„	
375	Newton Heath	J. J.	M.	44	„ 15	„ 15	„ 11	„ 15	Feb. 20	6	Hæmorrhagic.	Died	Unvaccinated			Previous case	1	
376	Ancoats	M. T.	M.	23	„ 16	„ 15	Jan. 11	„ 15	Mar. 21	35	Discrete	Recovered	C.	2 mod.	„	?	None	
377	Central	J. P.	M.	42	„ 17	„ 13		„ 14	„ 21	36	„	„	C.	1 faint		?	„	
378	Cheetham	T. O.	M.	20	„ 17	„ 16	Feb. 13	„ 17	„ 28	40	„	„	C.	2 good	„	?	„	
379	Ardwick	J. A. F.	M.	25	„ 17	„ 17	5 months	„ 17	May 9	52	Confluent	„	Unvaccinated		„	?	„	
380	Harpurhey	J. L.	M	42	„ 18	„ 18	Feb. 15	„ 18	Apr. 4	46	Discrete	„	C.	2 good		?	„	

APPENDIX VIII.—*continued.*

No.	Sanitary District.	Name.	Sex.	Age.	Notification.	Rash.	Last at School or Work.	Admitted to Hospital.	Discharged from Hospital.	Duration in Hospital.	Type.	Result.	Vaccination. Date.	Vaccination. Character.	Re-vaccination.	Source of Infection.	Other Cases.	Remarks. (Probable Source of Infection.)
										Days.								
381	Chorlton-on-Medlock	J. T.	M.	28	Feb. 18	Feb. 18	Feb. 15	Feb. 18	Apr. 25	67	Discrete	Recovered	C.	2 fair		?	None	
382	Newton Heath	W. R.	M.	23	„ 19	„ 18	„ 16	„ 19	„ 4	45	„	„	C.	1 good			„	Inspector Smethurst.
383	Moston	G. B.	M.	37	„ 19	„ 18	„ 17	„ 19	„ 28	69	Confluent	„	C.	1 „		?	„	
384	Chorlton-on-Medlock	S. T.	M.	21	„ 19			„ 19	Mar. 17	27	Mild	„	C.	3 faint				
385	Ancoats	P. J.	M.	25	„ 20	„ 19	„ 16	„ 20	May 2	72	Semi-confluent.	„	C.	3 mod.		?	None	
386	„	J. A.	M.	26	„ 20	„ 10	„ 18	„ 20	„ 23	93	Confluent	„	Unvaccinated			Previous case	1	
387	„	J. T.	M.	20	„ 20			„ 20	Mar. 21	30	Discrete	„	C.	3 mod.		„	2	
388	St. George's	W. W.	M.	46	„ 20	„ 20		„ 20	Apr. 28	68	„	„	C.	1 faint		?	None	
389	„	M. B.	F.	26	„ 20	„ 20		„ 20	„ 1	41	„	„	C.	4 mod.		5, Dyche Street	„	
390	Cheetham	J. H.	M.	45	„ 20	„ 20		„ 20	Mar. 2	11	Semi-confluent.	Died	C.	3 „				Acute œdematous laryngitis.
391	Ardwick	G. C.	M.	47	„ 20	„ 19	„ 19	„ 20	„ 24	33	Discrete	Recovered	C.	1 good		?	„	
392	Openshaw	J. W.	M.	27	„ 20	„ 19	„ 18	„ 20	Apr. 18	58	Confluent	„	Uncertain				„	
393	Chorlton-on-Medlock	S. F.	M.	32	„ 20		„ 18	„ 20	„ 25	65	Semi-confluent.	„	C.	1 good	Feb.	Previous case	1	
394	Ancoats	J. W. R.	M.	13	„ 21	„ 18	„ 19	„ 21	Mar. 24	32	Discrete	„	C.	2 mod.	Not	?	None	
395	„	H. H.	M.	26	„ 21	„ 19	„ 18	„ 21	Apr. 11	50	Semi-confluent	„	Unvaccinated			Previous case	3	
396	Central	G. R.	M.	35	„ 21			„ 21	„ 4	43	Discrete	„	C.	1 good 1 fair				
397	St. George's	W. M.	M.	25	„ 21	„ 21	„ 18	„ 21	Mar. 21	29	„	„	C.	3 „		36, Copper Street	None	
398	Moston	L. K.	F.	14	„ 21	„ 18	„ 20	„ 21	„ 25	33	Mild	„	C.	4 good		?	„	(Highly modified.)
399	„	A. G.	F.	23	„ 21	„ 18	„ 11	„ 21	„ 21	29	Discrete	„	C.	3 mod.		?	„	
400	Chorlton-on-Medlock	H. F.	M.	30	„ 21	„ 20	„ 14	„ 21	„ 28	36	„	„	C.	1 faint		Previous case	2	
401	Hulme	W. H. H.	M.	42	„ 21	„ 19	„ 17	„ 21	„ 21	29	Mild	„	C.	2 good		Monsall Hospital	None	
402	St. George's	R. I.	M.	15	„ 22	„ 20	„ 21	„ 22	„ 17	24	„	„	C.	4 mod.		?	„	(Highly modified.)
403	„	J. C.	F.	33	„ 22	„ 20	„ 21	„ 22	Apr. 22	60	Discrete	„	C.	5 „		?	„	
404	Blackley	E. B.	M.	45	„ 22	„ 21	„ 18	„ 22	Mar. 24	31	„	„	C.	No marks		?	None	
405	St. George's	T. W.	M.	15	„ 23	„ 21	„ 18	„ 23	„ 17	23	Mild	„	C.	4 mod.		?	„	
406	Newton Heath	J. W. H.	M.	19	„ 23	„ 23	„ 18	„ 23	„ 28	34	Discrete	„	C.	2 good		?	„	
407	Central	F. W.	M.	21	„ 24	„ 20		„ 24	„ 21	76	Mild	„	C.	2 mod.				Sunderland, by contact.
409	Crumpsall	T. C.	M.	63	„ 24	„ 22		„ 24	May 23	89	Discrete	„	Uncertain.		16th Feb. 1893, successfully in three places.			From case removed from ward to hospital.
409	Newton Heath	M. S.	F.	15	„ 22	„ 24	Feb. 2	„ 24	Mar. 25	30	Mild	„	C.	2 mod.	Not	?	None	

APPENDIX VIII.—*continued.*

No.	Sanitary District.	Name.	Sex.	Age.	Notification.	Rash.	Last at School or Work.	Admitted to Hospital.	Discharged from Hospital.	Duration in Hospital.	Type.	Result.	Vaccination.		Re-vaccination.	Source of Infection.	Other Cases.	Remarks. (Probable Source of Infection.)
													Date.	Character.				
										Days.								
410	Ancoats	F. R.	F.	11	Feb. 25	Feb. 24	Feb. 20	Feb. 25	Mar. 25	29	Mild	Recovered	C.	3 good	20th Feb. 1893, successfully in two places.	Previous case	1	
411	St. George's	F. B.	M.	31	„ 26	„ 25	„ 25	„ 25	„ 24	28	Discrete	„	C.	3 faint		„		
412	Beswick	J. C.	M.	26	„ 25	„ 22	„ 20	„ 25	Apr. 28	63	Confluent	„	Unvaccinated.			?	None	
413	Ancoats	J. M.	M.	35	„ 25	„ 22	„ 21	„ 26	Mar. 24	27	Discrete	„	C.	2 good		?	„	
414	St. George's	R. D.	M.	18	„ 27	„ 26	„ 24	„ 26	May 2	66	„	„		No marks		?	„	
415	„	W. B.	M.	46	„ 27	„ 20	„ 20						C.	Two		?	„	
416	Cheetham	T. H.	M.	28	„ 27	„ 25		„ 27	Mar. 21	23	Mild	„	C.	3 mod.		Prisoner John Lee.		
417	St. George's	J. E. J.	M.	27	Mar. 1	Mar. 1	„ 14	Mar. 1	Apr. 4	35	Discrete	„	C.	1 good		?	None	
418	„	J. L.	F.	38	„ 1	Feb. 28		„ 1	Mar. 24	24	Mild	„	C.	2 mod.		?	„	
419	Newton Heath	J. D.	M.	40	„ 1	„ 25	„ 21	„ 1	„ 28	28	„	„	C.	2 „		?	„	
420	Central	A. S.	M.	34	„ 2	„ 28	„ 23	„ 2	„ 28	27	Discrete	„	C.	2 faint		?	„	
421	Ancoats	J. W.	M.	18	„ 3	Mar. 1	„ 22	„ 3	Apr. 4	33	„	„	C.	2 mod.		?	„	
422	„	F. W.	M.	26	„ 4	„ 2	Mar. 4	„ 4	„ 4	32	„	„	C.	1 very good.		?	„	
423	„	M. J.	M.	21	„ 6	„ 5	„ 2	„ 6	„ 18	44	Semi-confluent.	„	C.	4 mod.		Previous case	1	
424	St. George's	J. W.	M.	74	„ 6	„ 6	„ 3	„ 6	„ 21	47	Discrete	„	C.	2 faint		„	1	
425	„	C. R. G.	M.	1	„ 6	„ 6		„ 6	Mar. 19	14	Semi-confluent.	Died	Unvaccinated			„	2	
426	„	M. E. K.	F.	25	„ 6	„ 6	„ 6	„ 6	Apr. 8	34	Discrete	Recovered	C.	2 faint		„	1	
427	„	J. C.	M.	24	„ 6	„ 5	„ 2	„ 6	Mar. 28	23	Mild	„	C.	4 good	Said he was revaccinated on entering the Militia; no evidence of it.	?	None	
428	„	A. R.	F.	34	„ 7	„ 5		„ 7	Apr. 20	54	Discrete	„	C.	2 „		?	„	
429	Openshaw	W. H. H.	M.	36	„ 7	„ 5	„ 3	„ 7	„ 25	50	Confluent	„	C.	2 „		?	„	
430	Gorton	J. S.	M.	30	„ 7	„ 7	„ 4	„ 7	„ 25	50	Discrete	„	C.	2 very fair		?	„	
431	St. George's	V. R.	F.	25	„ 9	„ 6		„ 9	„ 7	30	Mild	„	C.	2 very fair.		Previous case	2	
432	„	W. J.	M.	41	„ 9	„ 9		„ 9	Mar. 19	11	Confluent	Died	C.	1 mod.		„	3	
433	Newton Heath	J. H.	M.	22	„ 9	„ 9	„ 8	„ 9	„ 18	10	Semi-confluent.	Recovered	C.	2 good		?	None	
434	„	J. A. R.	F.	21	„ 9	„ 6	„ 4	„ 9	Apr. 8	31	Mild	„	C.	4 faint		?	„	
435	Ardwick	E. C.	F.	30	„ 9	„ 9	„ 6	„ 9	„ 15	38	Discrete	„	C.	2 mod.		Previous case.	1	

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APPENDIX VIII.—*continued.*

No.	Sanitary District.	Name.	Sex.	Age.	Notification.	Rash.	Last at School or Work.	Admitted to Hospital.	Discharged from Hospital.	Duration in Hospital.	Type.	Result.	Vaccination.		Re-vaccination.	Source of Infection.	Other Cases.	Remarks. (Probable Source of Infection.)
										Days.			Date.	Character.				
435	Hulme	R. H.	M.	32	Mar. 9			Mar. 9	Apr. 21	44	Discrete	Recovered	C.	2 very good.		?	None	
437	Cheetham	F. McG.	F.	37	„ 10	Mar. 7		„ 10	„ 7	29	„	„	C.	3 faint		?	„	
438	Newton Heath	W. G.	M.	21	„ 10	„ 9	Mar. 7	„ 10	„ 7	29	„	„	C.	1 mod.		92, Hadfield St.	„	
439	„	M. A. B.	F.	28	„ 10	„ 9	„ 6	„ 10	„ 22	44	„	„	C.	3 faint		„	„	
440	Central	J. B.	M.	35	„ 11	„ 10	„ 8	„ 11	July 11	93	Confluent	„	C.	2 mod.		„	„	Frank Brown, Feb. 25.
441	St. George's	J. T.	M.	18	„ 11	„ 11		„ 11	Apr. 11	32	Mild	„	C.	3 good		?	4	
442	Hulme	P. B.	M.	43	„ 11			„ 11	May 12	63	Discrete	„	C.	1 „		Previous case.	1	
443	„	L. W.	M.	23	„ 11			„ 11	„ 2	53	„	„	C.	2 mod.		„	2	
444	„	J. W.	M.	55	„ 11	„ 10	1 mo. ago	„ 11	Apr. 25	46	Semi-confluent.	„	C.?	No marks		„	3	
445	„	D. N.	M.	63	„ 11			„ 11	„ 11	32	Discrete	„	C.	1 good		„	4	
446	Cheetham	G. G.	M.	35	„ 12	„ 3	„ 10	„ 12	„ 18	38	„	„	C.	2 very faint.		?	None	
447	Crumpsall	H. B.	M.	20	„ 12	„ 10	„ 7	„ 12	„ 11	31	„	„	C.	2 good		?	„	
448	Newton Heath	L. D.	F.	34	„ 12	„ 12		„ 12	„ 29	49	„	„	C.	3 fair	Not	Previous case.	1	
449	Hulme	W. G.	M.	34	„ 12	„ 12		„ 12	May 9	59	„	„	C.	2 „		„	3	
450	Ancoats	R. T.	M.	40	„ 13	„ 12	„ 9	„ 13	Apr. 14	33	Confluent	„	C.	1 faint		?	None	
451	Central	E. W.	M.	23	„ 13	„ 12		„ 13	June 6	86	„	„	C.	4 mod.		Previous case.	One	
452	„	E. S.	F.	3	„ 13	„ 12		„ 13	Mar. 25	13	Semi-confluent.	„	Unvaccinated.			„	2	
453	St. George's	J. S.	M.	26	„ 13	„ 12		„ 12	Apr. 11	31	Discrete	„				„	1	
454	„	J. B.	M.	16	„ 13	„ 11	„ 9	„ 13	„ 18	37	„	„	C.	4 good		?	None	
455	Newton Heath	M. E. G.	F.	10	„ 13	„ 9	Feb. 23	„ 13	Mar. 25	13	„	„	Unvaccinated.			?	„	
456	„	J. A.	M.	32	„ 13	„ 13	Mar. 10	„ 13	Apr. 11	30	„	„	C.	2 good		?	„	
457	„	J. A. G.	M.	18	„ 13	„ 11	„ 10	„ 13	„ 11	30	Mild	„	C.	4 good		?	„	(Highly modified.)
458	Ancoats	B. G.	M.	38	„ 14	„ 14	„ 13	„ 15	„ 18	35	Confluent	„	C.	2 „		?	„	
459	„	J. W.	M.	28	„ 14	„ 13	„ 11	„ 14	„ 11	29	Discrete	„	C.	2 faint		Previous case.	1	
460	Cheetham	J. F.	M.	21	„ 14	„ 14	„ 13	„ 14	May 26	74	„	„	C.	1 good		„		
461	Harpurhey	E. G.	F.	30	„ 14	„ 11		„ 14	„ 12	60	Confluent	„	C.	3 faint		?	None	
462	Hulme	N. H.	M.	42	„ 14			„ 14	Apr. 11	29	Discrete	„	C.	1 good		Previous case.	6	
463	„	R. H.	M.	21	„ 14		2 weeks ago.	„ 14	„ 11	29	Mild	„	C.	2 „		„	7	
464	„	R. S.	M.	54	„ 14	„ 14	Not for several weeks.	„ 14	„ 11	29	„	„	C.	3 „		„	8	
465	Chorlton-on-Medlock	T. W. B.	M.	40	„ 15	„ 15	Mar. 14	„ 15	„ 11	28	Discrete	„	C.	1 faint		?	None	

Appendix VIII.—*continued.*

No.	Sanitary District.	Name.	Sex.	Age.	Notification.	Rash.	Last at School or Work.	Admitted to Hospital.	Discharged from Hospital.	Duration in Hospital.	Type.	Result.	Vaccination. Date.	Vaccination. Character.	Re-vaccination.	Source of Infection.	Other Cases.	Remarks. (Probable Source of Infection.)
466	Ancoats	E. H.	F.	25	Mar. 16	Mar. 13		Mar. 16	April 11	27	Discrete	Recovered	C.	4 very good.		?	None	
467	„	H. W.	M.	20	„ 16	„ 16	Mar. 11	„ 16	„ 18	34	„	„	C.	1 very good.		Previous case	1	
468	Central	A. S.	M.	11	„ 16	„ 16	„ 1	„ 16	May 5	51	„	„	Unvaccinated			„	3	
469	„	N. S.	F	1	„ 16	„ 16		„ 16	Mar. 25	10	„	„	„			„	4	
470	St. George's	E. A. M.	F.	23	„ 16	„ 16		„ 16	April 15	31	Mild	„	C.	3 very good.		„		
471	Newton Heath	L. D.	F.	15	„ 16	„ 16	Mar. 9	„ 16	„ 22	38	„	„	C.	4 very good.	Mar. 12 successfully in two places.	„	2	
472	Harpurhey	J. I.	M.	43	„ 17	„ 15	None	„ 17	Mar. 26	10	Confluent	Died	C.	1 mod.		?	None	
473	Newton Heath	J. W. A.	M.	43	„ 17	„ 17	Mar. 14	„ 17	April 18	33	Discrete	Recovered	C.	2 „			„	
474	St. George's	A. N.	F.	14	„ 19	„ 19	„ 17	„ 18	May 6	40	Mild	„	C.	2 good 1 mod.		Previous case	1	
475	Central	T. L.	M.	34	„ 23	„ 21		„ 23	April 21	30	Discrete	„	1 fair primary cicatrix.					
476	„	A. F.	F.	20	„ 23	„ 20	Mar. 18	„ 23	„ 14	23	Semi-confluent.	„	C.	2 fair			None	
477	Cheetham	M. B.	F.	35	„ 23	„ 22	„ 20	„ 23	Mar. 25	3	Discrete	„	C.	2 faint		?	„	
478	Newton Heath	H. F.	F.	45	„ 23	„ 19		„ 23	April 14	23	Mild	„	C.	2 good		?	„	
479	Hulme	W. S.	M.	35	„ 23	„ 22		„ 23	„ 25	34	Discrete	„	C.	2 mod.		Previous case	9	
480	Ancoats	E. H.	F.	29	„ 24	„ 21		„ 24	„ 4	12	„	„	C.	3 „		?	None	
481	St. George's	E. B.	F.	12	„ 24	„ 23		„ 24	„ 4	12	Semi-confluent.	„	C.	3 poor		Previous case	1	
482	„	C. V.	F.	10	„ 24	„ 23		„ 24	„ 29	37	Mild	„	C.	2 mod.		„	2	
483	Blackley	J. E. B.	M.	15	„ 24	„ 24	Mar. 21	„ 24	„ 21	29	„	„	C.	4 „	Not	?	None	(Highly modified.)
484	Newton Heath	E. B.	F.	30	„ 26	„ 25	11 months ago.	„ 26	„ 29	35	„	„	C.	4 „		?	„	„ „
485	Central	H. M.	F.	32	„ 27	„ 26	Mar. 23	„ 27	June 24	90	Semi-confluent.	„	C. ?	No marks		?	„	
486	St. George's	F. C.	M.	27	„ 27	„ 27		„ 26	July 4	101	Confluent	„	Unvaccinated			?	„	
487	Choriton-on-Medlock	E. H.	F.	45	„ 27	„ 25		„ 27	May 29	55	Semi-confluent.	„	C.	1 mod. prim. cicatrix.	Not	?	„	
488	St. George's	S. M.	M.	25	„ 28	„ 25		„ 28	„ 30	64	„	„	C.	3 faint		?	„	
489	Newton Heath	J. W.	M.	50	„ 28	„ 27	Mar. 14	„ 28	July 4	99	„	„	C.	2 „		?	„	
490	Ancoats	W. McC.	M.	35	„ 29	„ 29	Jan. 1	„ 29	April 25	28	Discrete	„	C.	1 „	Not	?	„	
491	Hulme	W. Y.	M.	26	„ 29	„ 29	Mar. 25	„ 29	May 16	49	„	„	C.	2 „		?	„	
492	St. George's	S. H.	F.	19	„ 30	„ 30		„ 30	„ 29	52	Semi-confluent.	„	C.	3 good		?	„	
493	„	J. T.	M.	28	„ 30	„ 29		„ 30	„ 23	55	„	„	C.	3 fair		?	2	
494	Ancoats	J. L.	M.	44	„ 31	„ 31	Mar. 28	„ 31	„ 5	36	Discrete	„	C.	6 good		?	None	

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Appendix VIII—*continued.*

No.	Sanitary District.	Name.	Sex.	Age.	Notification.	Rash.	Last at School or Work.	Admitted to Hospital.	Discharged from Hospital.	Duration in Hospital.	Type.	Result.	Vaccination. Date.	Vaccination. Character.	Re-vaccination.	Source of Infection.	Other Cases.	Remarks. (Probable Source of Infection.)
495	Rusholme	F. A.	M.	18	April 1	Mar. 27	Mar. 25	April 1	May 2	32	Mild	Recovered	C.	1 fair		?	None	
496	„	E. A.	F.	42	„ 1	„ 31		„ 1	„ 2	32	„	„	C.	3 very good.		Previous case	1	
497	St. George's	W. O.	M.	30	„ 3	April 3	„ 30	„ 3	„ 5	33	„	„	C.	1 good	24 Mar., 1893, 3 successful.	- - -		Horrocks, Piccadilly.
498	Ancoats	M. A. P.	F.	29	„ 4	„ 2		„ 4	April 17	14	Confluent	Died	C.	1 faint		- - -		In contact with patient from 63, North Porter Street.
499	Hulme	J. B.	M.	52	„ 4	„ 4	Out of work.	„ 4	„ 5	2	„	„	C.	4		Previous case	Ten	
500	„	T. W.	M.	33	„ 4	„ 4		„ 4	„ 13	10	„	„	C.	1		„	Elv'n	
501	„	H. B.	F.	28	„ 6	„ 2		„ 6	May 13	38	Discrete	Recovered	C.	3 fair	Not	?	None	
502	St. George's	A. B.	F.	44	„ 7	„ 7		„ 7	April 25	19	Semi-confluent.	„	C.	2 good		Previous case	Two	
503	„	W. H. F. T.	M.	17	„ 7	„ 6	April 6	„ 7	May 12	36	Discrete	„	C.	2 mod.		?	None	
504	Harpurhey	W. W.	M.	25	„ 7	„ 5	„ 1	„ 7	„ 9	33	„	„	C.	3 good	Not	?	„	
505	Ancoats	W. A.	M.	31	„ 8		„ 7	„ 8	„ 9	32	„	„	C.	3 mod.		Previous case	One	
506	Cheetham	T. W.	M.	44	„ 8	„ 6	„ 5	„ 8	„ 7	30	„	Escaped	C.	3 „		„		
507	Crumpsall	J. M.	M.	61	„ 8	„ 8		„ 8	„ 23	46	Mild	Recovered	C.	1 good				
508	Newton Heath	M. G.	F.	22	„ 8	„ 8	„ 6	„ 8	„ 30	53	Discrete	„	C.	1 poor		?	None	
509	„	E. P.	F.	22	„ 9	„ 9	„ 5	„ 10	„ 20	41	„	„	C.	1 „				
510	Rusholme	G. M.	M.	24	„ 9	„ 8	„ 7	„ 9	„ 9	31	Mild	„	C.	2 very faint.				
511	St. George's	J. W. S.	M.	19	„ 10	„ 9	„ 8	„ 10	June 16	68	Confluent	„	Vaccinated ?		No marks.	?	None	
512	Cheetham	E. L.	M.	51	„ 10	„ 9	„ 8	„ 10	May 9	30	Discrete	„	C.	1 poor		?		
513	„	W. G.	M.	18	„ 10	„ 8	„ 8	„ 10	„ 12	33	„	„	C.	2 good				
514	Newton	W. H. H.	M.	23	„ 10	„ 8	5 months ago.	„ 10	„ 30	51	„	„	C.	3 mod.		?	None	
515	Central	E. S.	F.	41	„ 11	„ 9	Mar. 29	„ 11	April 11	1	Confluent	Died	C.	1 good		?	„	
516	St. George's	A. B.	F.	10	„ 11	„ 10	April 10	„ 11	June 24	75	Discrete	Recovered	C.	1 very faint.		Previous case	One	
517	„	E. S.	F.	18	„ 11	„ 10	3 weeks ago.	„ 11	July 1	82	„	„	C.	3 good	Not	„	Two	
518	„	W. B.	M.	8	„ 11	„ 10	April 6	„ 11	June 24	75	Mild	„	C.	4 „	„	„	Three	
519	„	J. B.	M.	48	„ 11	„ 11	„ 10	„ 11	May 23	43	Discrete	„	C.	2 faint	„	„	Four	
520	„	F. B.	M.	20	„ 12	„ 12	„ 8	„ 11	„ 20	40	„	„	C.	4 very good.		?	None	
521	„	F. M.	M.	15	„ 12	„ 11	„ 8	„ 12	June 16	66	Confluent	„	Unvaccinated ?		Not	Place of work	„	
522	Cavetown	T. S.	M.	24	„ 12	„ 10	„ 7	„ 12	May 9	28	Mild	„	C.	4 mod.	7 March 1893.			
523	„	J. A.	M.	37	„ 12	„ 12	„ 11	„ 12	April 20	9	Confluent	Died	C.	4 faint				
524	Central	G. B.	M.	26	„ 13	„ 13		„ 13	July 4	83	„	Recovered	C.	1 „		?	None	

Appendix VIII.—*continued.*

No.	Sanitary District.	Name.	Sex.	Age.	Notification.	Rash.	Last at School or Work.	Admitted to Hospital.	Discharged from Hospital.	Duration in Hospital.	Type.	Result.	Vaccination.		Re-vaccination.	Source of Infection.	Other Cases.	Remarks. (Probable Source of Infection.)
													Date.	Character.				
										Days.								
525	Central	J. T.	M.	32	Apr. 13			Apr. 13	May 30	48	Discrete	Recovered	C.	3 mod.		?	None	
526	St. George's	L. B.	F.	33	„ 14	Apr. 13		„ 14	June 24	72	„	„	C.	4 „		?	„	
527	Central	W. M.	M.	45	„ 15	„ 12	Apr. 15	„ 15	May 30	46	„	„	C.	4 poor		?	„	
528	St. George's	G. K.	M.	32	„ 15	„ 14	7 weeks since.	„ 15	„ 12	18	„	„	C.	2 mod.		1, Old Mount Street	None	
529	„	R. W.	M.	24	„ 16	„ 15	Apr. 15	„ 16	„ 24	38	„	„	C.	2 good	No	?	„	
530	Central	J. M.	M.	40	„ 17	„ 15	„ 12	„ 17	„ 23	37	Semi-confluent.	„	C.	2 fair		?	„	
531	„	W. M.	M.	17	„ 17	„ 15	„ 12	„ 17	„ 16	30	Discrete	„	C.	4 good	Not	- - -	„	John Whalley, who was discharged from Monsall 15th day. At a fair on some vacant land near Monsall.
532	St. George's	A. J.	M.	33	„ 17	„ 17		„ 17	„ 23	37	Semi-confluent.	„	C.	1 „		?	„	
533	Ancoats	T. F. C.	M.	25	„ 19	„ 18	„ 15	„ 19	June 29	63	Confluent	„	C.	2 fair		?	„	
534	St. George's	G. F.	M.	28	„ 19	„ 19	„ 17	„ 19	„ 6	40	Discrete	„	C.	1 „	„	?	„	
535	„	J. M.	F.	11	„ 20	„ 17	Sept.	„ 20	May 20	31	„	„	C.	2 „	„	?	„	
536	Moston	G. P.	M.	13	„ 20	„ 18	Apr. 14	„ 20	„ 16	27	Mild	„	C.	3 „		?	„	(Highly modified.)
537	Bradford	E. G.	F.	30	„ 20	„ 17	„ 16	„ 20	„ 20	31	„	„	C.	3 good	„	?	„	
538	Ancoats	M. A. M'H.	F.	22	„ 21	„ 19	Feb. last	„ 21	„ 27	37	Discrete	„	C.	4 mod.		?	„	
539	„	B. McH.	F.	12	„ 21	„ 20	Apr. 17	„ 21	„ 3	13	Confluent	„	?	?		Previous case	1	
540	Rusholme	J. P.	M.	39	„ 21	„ 20	„ 18	„ 21	May 1	11	„	Died	C.	2 mod.		?	None	
541	St. George's	S. A.	M.	23	„ 22	„ 21	„ 17	„ 22	„ 23	32	Discrete	Recovered	C.	4 good	„	?	„	
542	Ardwick	B. E. G.	M.	34	„ 22	„ 22	„ 20	„ 22	June 2	42	Semi-confluent.	„	C.	2 fair		?	„	
543	Central	P. E.	M.	24	„ 23			„ 23	May 24	31	Discrete	„	C.	3 mod.				
544	Newton Heath	H. H.	M.	15	„ 23	„ 13	„ 22	„ 23	„ 30	38	„	„	C.	3 faint		?	None	
545	Hulme	M. L.	F.	30	„ 23	„ 19	„ 22	„ 23	June 13	52	„	„	C.	2 „	„	9, Kingston St.	„	
546	Ancoats	W. T.	M.	16	„ 24	„ 22	„ 19	„ 24	May 23	30	„	„	C.	4 good		?	„	
547	Cheetham	J. F.	M.	31	„ 24	„ 22	„ 22	„ 24	June 13	51	Semi-confluent.	„	C.	1 „		- - -		Prisoner William Gamble, who was located in a cell directly underneath the one occupied by the patient.
548	Ardwick	W. J.	M.	45	„ 24	„ 24	„ 22	„ 24	May 30	37	Discrete	„	C.	2 poor		?	None	
549	Gorton	W. S.	M.	53	„ 24	„ 23	„ 20	„ 24	„ 25	30	„	„	C.	1 good 2 faint		?		
550	Ancoats	M. H.	F.	30	„ 25	„ 25	„ 25	„ 25	„ 24	39	Semi-confluent.	„	C.	2 fair		93, Silk Street	„	
551	„	S. E. Q.	F.	12	„ 25	„ 24	„ 21	„ 25	June 17	54	„	„	C.	1 faint		?	„	
552	„	M. M.	F.	20	„ 25	„ 23	Sept. last	„ 25	May 27	33	Discrete	„	C.	3 mod.		93, Silk Street	„	

MANN, CHESTER.

APPENDIX VIII.—*continued.*

No.	Sanitary District.	Name.	Sex.	Age.	Notification.	Rash.	Last at School or Work.	Admitted to Hospital.	Discharged from Hospital.	Duration in Hospital.	Type.	Result.	Vaccination.		Re-vaccination.	Source of Infection.	Other Cases.	Remarks. (Probable Source of Infection.)
													Date.	Character.				
553	St. George's	E. K.	F.	25	Apr. 25	Apr. 24		Apr. 25	May 23	Days. 29	Mild	Recovered	C.	1 faint	Not	Previous case	One	(Highly modified).
554	„	J. H. C.	M.	29	„ 25	„ 24	Apr. 25	„ 25	„ 16	22	„	„	C.	5 fair	„	- - -	None	From contact with Stretford Sanitary Inspector.
555	Ancoats	J. G.	M.	11	„ 26	„ 24	„ 21	„ 25	„ 30	36	„	„	C.	3 good		?	„	
556	„	Y. C.	M.	11	„ 26	„ 25	3 weeks ago	„ 26	July 21	57	Confluent	„	Unvaccinated			?	„	
557	Cheetham	E. B.	M.	23	„ 26	„ 26	Apr. 22	„ 26	May 23	28	Discrete	„	C.	1 good		?	„	
558	Moston	F. W. J.	M.	14	„ 26	„ 20	In Feb.	„ 26	„ 23	28	Mild	„	C.	3 „		?	„	
559		W. T. J.	M.	45	„ 26	„ 24	Apr. 21	„ 26	„ 26	31	Discrete	„	C.	2 good	„	Previous case	One	
560	Newton	H. F.	M.	13	„ 26	„ 25	„ 20	„ 26	„ 30	35	„	„	C.	4 „		?	None	
561	Hulme	H. C.	M.	24	„ 26	„ 25	„ 22	„ 26	June 13	49	„	„	Unvaccinated.			- - -	„	From his employment.
562	Ancoats	F. E. M.	F.	12	„ 27	„ 26	„ 20	„ 27	„ 17	52	„	„	C.	1 good		?	„	
563	„	C. W.	M.	37	„ 27	„ 27	„ 24	„ 27	„ 9	44	Semi-confluent.	„	C.	2 mod.			„	
564	Harpurhey	C. R. J.	M.	9	„ 27	„ 23	„ 21	„ 17	May 23	27	Mild	„	C.	2 faint	„	?	„	
565	Ancoats	W. J. J.	M.	19	„ 28	„ 26	„ 24	„ 28	„ 23	26	Discrete	„	C.	4 good		?	„	
566	St. George's	J. T.	M.	28	„ 28	„ 28		„ 28	July 11	45	„	„	C.	1 mod.		?	„	
567	„	C. Q.	F.	33	„ 28	„ 23	„ 21	„ 28	May 3	6	„	„	C.	2 good		From school	„	St. Ann's, Ancoats.
568	„	H. L.	M.	21	„ 28	„ 26	„ 25	„ 28	July 11	75	Confluent	„	Unvaccinated.		„	?	„	
569	Blackley	R. A. E.	F.	14	„ 28	„ 27	„ 25	„ 28	May 6	9	„	„			„	- - -	„	Girl had it that worked with patient.
570	Ancoats	A. G.	F.	28	„ 29	„ 28	„ 22	„ 29	„ 12	14	Semi-confluent.	„	C.	1 good		?	„	
571	St. George's	E. M.		25	„ 29	„ 28		„ 29	June 17	50	Discrete	„	C.	3 poor	„	?	„	
572	Blackley	S. A. R.	F.	42	„ 29	„ 26	„ 24	„ 29	„ 24	57	„	„	C.	3 mod.	„	?	„	
573	Bradford	J. M.	M.	32	„ 29	„ 26	„ 25	„ 29	„ 20	53	Confluent	„	C.	2 good	„	103, Gt. Ancoat Street.	„	
574	Ancoats	W. H.	M.	3	„ 29	„ 29		„ 29	May 13	15	Semi-confluent.	Died	Unvaccinated.			Previous case	One	
575	Chorlton-on-Medlock	J. W.	M.	32	„ 29	„ —	„ 26	„ 29	July 7	70	Confluent	Recovered	C.	1 good		?	None	
576	Central	M. D.	M.	13	„ 30	„ 28		„ 30	June 20	52	Semi-confluent.	„	Unvaccinated.			- - -	„	Monsall Hospital.
577	Newton Heath	A. H.	M.	22	„ 30	„ 29	„ 27	„ 30	„ 6	38	Discrete	„	C.	2 good		?	„	
578	Ancoats	J. M.	M.	42	May 1	„ 30	„ 28	May 1	„ 6	37	„	„	C.	„		?	„	
579	„	E. A. O.	F.	30	„ 1	„ 30		„ 1	„ 9	40	„	„	C.	3 fair		?	„	
580	St. George's	A. McL.	M.	48	„ 1	May 1		„ 1	„ 6	37	„	„	C.	2 good		Previous case	One	
581	„	E. M.	F.	12	„ 1	„ 1		„ 1	„ 7	38	„	„	C.	3 „		„	„	
582	„	J. T.	F.	30	„ 2	Apr. 25	„ 25	„ 2	„ 7	37	„	„	C.	2 „		?	None	
583	„	L. T.	F.	22	„ 2	May 2		„ 2	„ 10	40	Mild	„	C.	3 „		Previous case	Two	

APPENDIX VIII.—*continued.*

No.	Sanitary District.	Name.	Sex.	Age.	Notification.	Rash.	Last at School or Work.	Admitted to Hospital.	Discharged from Hospital.	Duration in Hospital.	Type.	Result.	Vaccination.		Re-vaccination.	Source of Infection.	Other Cases.	Remarks. (Probable Source of Infection.)
										Days.			Date.	Character.				
584	St. George's	R. H. M.	M.	21	May 2	May 2	May 1	May 2	June 6	36	Discrete	Recovered	C.	2 good and 3 mod		Previous case	2	
585	Beswick	P. G.	F.	16	„ 2	„ 1	Apr. 29	„ 2	May 16	46	Confluent	„	C.	3 faint		?	None	
586	Chorlton-on-Medlock	D.	F.	75	„ 2	Apr. 29												
587	„	P. A.	M.	20	„ 2	May 1	„ 29	„ 2	June 20	50	Confluent	„	C.	2 poor	Not	J. Mitchell, Apr. 29.	„	
588	Hulme	R. N.	M.	50	„ 2	Apr. 28	„ 13	„ 2	May 30	29	Discrete	„	C.	1 good	„	?	„	
589	Ancoats	K. O. B.	F.	16	„ 3	May 2	„ 29	„ 3	„ 12	10	Semi-confluent, Mild	„	Unvaccinated.			22, German St.	„	
590	St. George's	J. A.	M.	11	„ 3	„ 2	„ 21	„ 3	„ 30	28		„	C.	4		Previous case	1	
591	Harpurhey	M. W.	F.	10	„ 3	Apr. 15	„ 14	„ 3	„ 16	14		„	C.	4 good	„	?	None	Phthiriasis, *not* variola.
592	„	B. W.	M.	11	„ 3	May 1	„ 14	„ 3	„ 8	6	Hæmorrhagic.	Died	Unvaccinated			Previous case	1	
593	Ardwick	J. M. McK.	F.	34	„ 4	„ 2	„ 27	„ 4	June 3	31	Discrete	Recovered	C.	2 good and 1 fair.		?	None	
594	Gorton	J. P.	M.	36	„ 4	„ 1	„ 29	„ 4	„ 3	31	Mild	„	C.	5 faint	Yes	?	„	
595	Hulme	M. S.	F.	22	„ 4	„ 2	„ 30	„ 4	„ 17	45	Confluent	„	C.	2 very good.		- - -	„	Little Lever Street, Lober and Lehman's.
596	„	S. T.	F.	41	„ 4	„ 2	Mar. 30	„ 4	„ 29	48	„	„	C.	2 good		?	„	
597	Ancoats	J. P.	M.	30	„ 5	„ 3	May 2	„ 5	May 9	5	Hæmorrhagic.	Died	? Unvaccinated, eruptions, oversight.			- - -	„	Patient arrived from Totley, Derbyshire, 27th April 1881.
598	Hulme	C. P.	F.	12	„ 5	Apr. 22		„ 5	June 17	44	Discrete	Recovered		?		?	„	
599	„	W. P.	M.	47	„ 5	May 2	Apr. 29	„ 5	„ 6	33	„	„	C.	3 fair		Previous case	1	
600	„	E. P.	M.	15	„ 5	„ 2	„ 22	„ 6	„ 17	43	„	„	C.	3 good		„	2	
601	Chorlton-on-Medlock	J. F. P.	M.	32	„ 6	„ 5	May 3	„ 6	May 10	5	Hæmorrhagic.	Died	C.	1 mod.		?	None	
602	Newton Heath	F. P.	M.	17	„ 7	„ 7	„ 4	„ 7	June 2	27	Discrete	Recovered	C.	2 good		Previous case	1	
603	Bradford	L. A.	F.	28	„ 7	„ 1	„ 2	„ 6	„ 3	29	„	„	C.	3 poor	Not	?	None	
604	Openshaw	J. H. W.	M.	22	„ 7	„ 5	„ 4	„ 7	„ 6	31	„	„	C.	4 mod.	„	?	„	
605	St. George's	J. H.	F.	38	„ 8	„ 8		„ 8	„ 10	34	„	„	C.	2 good		?	„	
606	„	T. E.	M.	28	„ 8	„ 5	„ 1	„ 8	„ 6	30	„	„	C.	3 „		?	„	
607	Harpurhey	E. A. W.	F.	46	„ 8	„ 7		„ 8	„ 17	41	„	„	C.	2 „		Previous case	2	
608	Ancoats	E. J.	F.	35	„ 9	„ 7		„ 9	„ 2	25	Semi-confluent.	„	C.	2 very faint.		93, Silk Street	None	
609	Newton Heath	S. E. T.	F.	12	„ 9	„ 5	Apr. 28	„ 9	„ 10	35	Mild	„	C	3 good		?	„	
610	St. George's	J. B.	M.	39	„ 10	„ 10	May 6	„ 10	„ 23	45	Semi-confluent.	„	?			?	„	
611	Newton Heath	E. A.	M.	16	„ 10	„ 7	16 days ago	„ 10					C.	4 good		?	„	This case was one of varicella.
612	Ardwick	J. E.	M.	47	„ 10	„ 10	May 5	„ 10	June 13	35	Discrete	Recovered	C.	4 poor		?	„	
613	Openshaw	W. G.	M.	16	„ 10	„ 6	5 weeks ago	„ 10	„ 9	31	Mild	„	C.	4 good	„	?	„	(Highly modified).

MANCHESTER.

APPENDIX VIII.—*continued.*

No.	Sanitary District.	Name.	Sex.	Age.	Notification.	Rash.	Last at School or Work.	Admitted to Hospital.	Discharged from Hospital.	Duration in Hospital.	Type.	Result.	Vaccination.		Re-vaccination.	Source of Infection.	Other Cases	Remarks. (Probable Source of Infection.)
													Date.	Character.				
										Days.								
614	Openshaw	C. G.	F.	18	May 10	May 9	9 months ago.	May 10	June 17	39	Mild	Recovered	C.	4 good	Not	Previous case	1	(Highly modified.)
615	Hulme	W. M.	M.	33	„ 10	„ 8	Apr. 27	„ 10	„ 6	28	Discrete	„	C.	2 mod.		?	None	
616	Central	M. A.	F.	25	„ 11	„ 10	May 7	„ 11	„ 19	31	„	„	C.	4 very fair.		Previous case	?	
617	St. George's	A. H.	F.	31	„ 11	„ 11		„ 11	May 22	12	„	„	C.	1 good			None	
618	„	R. C.	M.	37	„ 11	„ 10	„ 8	„ 11	June 20	41	Confluent	„		2 faint, primary; vaccinated twice.	2 poor, 2nd day, cicatrices.	?	„	
619	„	P. O. C.	M.	17	„ 11	„ 10	„ 6	„ 11	„ 9	30	Mild	„	C.	4 fair		?	„	
620	„	E. B.	M.	22	„ 11	„ 10	„ 6	„ 11	„ 6	27	„	„	C.	3 very good.		?	„	
621	Newton Heath	F. F.	M.	11	„ 11	„ 10	April 26	„ 11	„ 2	23	„	„	C.	4 good		Previous case	1	(Highly modified.)
622	„	S. F.	M.	7	„ 11	„ 10	„ 26	„ 11	„ 2	23	„	„	C.	3 „		„	2	„ „
623	Ancoats	A. C.	F.	13	„ 12	„ 10	9 months ago.	„ 12	„ 9	29	Discrete	„	C.	1 „		?	None	
624	„	S. C.	F.	9	„ 12	„ 10	May 5	„ 12	„ 9	29	Mild	„	C.	3 „		Previous case	1	
625	St. George's	E. C.	F.	9	„ 12	„ 12		„ 12	„ 6	26	Confluent	„	C.	3 mod.		?	None	
626	„	S. N.	M.	12	„ 12	„ 11		„ 12	„ 20	40	Semi-confluent.	„	C.?	No marks	Not	Previous case	1	
627	„	A. A.	M.	30	„ 12	„ 8	„ 6	„ 12	„ 9	29	Discrete	„	C.	2 good		?	None	
628	Ardwick	W. R.	M.	23	„ 12	„ 12	„ 12	„ 12	„ 16	36	„	„	C.	2 „	„	?	„	
629	Hulme	M. F.	F.	30	„ 12	„ 9		„ 12	„ 15	33	Confluent	„	C.	1 „		?	„	
630	St. George's	G. R.	M.	27	„ 13	„ 7		„ 13	„ 16	35	Discrete	„	C.	3 „		Previous case	1	
631	Blackley	W. R.	M.	38	„ 13	„ 13	„ 11	„ 13	„ 9	28	„	„	C.	1 „		„	1	
632	Ancoats	Mrs. O'N.	F.	30	„ 11			„ 11	„ 17	38	Mild	„	C.	3 „				Lodge at 6, Mayor Street.
633	„	J. F.	M.	17	„ 15	„ 12	„ 10	„ 13	„ 13	30	Discrete	„	No marks visible		„	?	None	
634	„	M. McF.	F.	22	„ 15	„ 13		„ 15	„ 24	41	„	„	C.	4 good	„	Previous case	1	
635	„	J. C.	M.	15	„ 15	„ 14	„ 13	„ 15	„ 13	30	„	„	C.	3 „	„	„	2	
636	Central	A. D.	F.	16	„ 15	„ 13	„ 10	„ 15	„ 6	23	Mild	„	C.	4 very good	„	„	1	(Highly modified.)
637	St. George's	J. J. N.	M.	19	„ 15	„ 13		„ 15	„ 20	37	Discrete	„	C.	1 good	„	„	2	
638	Hulme	E. P.	F.	17	„ 15	„ 14	„ 5	„ 15	„ 24	41	„	„	C.	1 mod. 3 good	„	„	3	
639	„	E. L.	F.	27	„ 15	„ 14	„ 11	„ 15	„ 2	19	„	„	C.	3 „	„	At work	None	
640	St. George's	J. D.	M.	28	„ 16	„ 16		„ 16	„ 16	32	„	„	C.	3 „	„	?	„	
641	Newton Heath	M. E. H.	F.	16	„ 16	„ 15	„ 14	„ 16	May 18	3	Confluent	Died	Unvaccinated		„	?	„	
642	Hulme	D. H.	F.	56	„ 16	„ 15	„ 12	„ 16	June 6	22	Mild	Recovered	C.	3 fair	„	At work	„	
643	„	J. B.	F.	21	„ 16	„ 15	„ 12	„ 16	„ 16	32	Discrete	„	Uncertain.		„	„	„	

APPENDIX VIII.—*continued.*

No.	Sanitary District.	Name.	Sex.	Age.	Notification.	Rash.	Last at School or Work.	Admitted to Hospital.	Discharged from Hospital.	Duration in Hospital.	Type.	Result.	Vaccination.		Re-vaccination.	Source of Infection.	Other Cases.	Remarks. (Probable Source of Infection.)
													Date.	Character.				
										Days.								
644	St. George's	A. D.	F.	27	May 17	May 17	May 9	May 17	June 6	21	Discrete	Recovered	C.	4 good	Not	Busy Bee Inn	None	
645	Newton Heath	R. W.	M.	19	„ 17	„ 17	„ 13	„ 17	„ 9	24	Mild	„	C.	4 very good	„	?	„	
646	Hulme	S. A. E.	F.	13	„ 17	„ 15		„ 17	„ 16	31	Discrete	„	C.	3 good	„	Previous case	„	
647	St. George's	B. R.	M.	65	„ 18	„ 18		„ 18	July 7	41	„	„	C.	4 faint	„	?	„	
648	Moston	G. D.	M.	17	„ 18	„ 17	„ 16	„ 18	June 16	30	„	„	C.	4 good	„	?	„	
649	„	R. D.	F.	21	„ 18	„ 17	„ 17	„ 18	„ 16	30	„	„	C.	4 „	„	Previous case	1	
650	Central	A. W.	M.	28	„ 19			„ 19	July 7	50	Mild	„	C.	1 „				Tramped from Glossop; admitted into the casual ward at 7, and sent to Monsall at 8.25 same night.
651	„	J. R.	M.	28	„ 19	„ 19		„ 19	June 30	43	Discrete	„	C.	3 mod.	„	?	None	
652	Gorton	S. A.	F.	23	„ 19	„ 17	„ 16	„ 19	„ 16	29	„	„	C.	3 faint	Not	- - -	None	From A. Hilton, removed from Victoria Inn, Oldham Rd.
653	Ancoats	K. T.	F.	13	„ 20	„ 20		„ 20	„ 16	28	Confluent	„	C.	4 fair	„	Previous case	Two	
654	St. George's	A. W.	F.	19	„ 20	„ 18	„ 17	„ 20	„ 13	25	Mild	„	C.	2 good	„	?	None	
655	Ancoats	H. F.	M.	3 mths.	„ 22	„ 20		„ 21	„ 5	16	Confluent	Died	Un-vaccinated during incubation.	Vaccinated unsuccessfully.	17 May, 1893.	- - -	„	Miss Smith, removed from Hulme to Monsall.
656	„	J. F.	F.	16	„ 22	„ 21	„ 15	„ 22	„ 16	26	Mild	Recovered	C.	4 very good.	Not	Previous case	One	(Highly modified.)
657	St. George's	M. A. L.	F.	25	„ 23	„ 19	„ 22	„ 22	„ 16	26	Discrete	„	C.	2 good	„	?	None	
658	Hulme	M. J. H.	F.	14	„ 23	„ 20	„ 18	„ 23	„ 24	33	„	„	C.	2 mod.	„	66, Upper Duke Street.	„	
659	Openshaw	S. A. K.	F.	25	„ 24	„ 24		„ 24	„ 20	28	„	„	C.	3 good	„	54, Prince Street, Ardwick.	„	
660	Cheadle-on-Medlock	L. J.	F.	38	„ 24	„ 21		„ 24	„ 20	28	„	„	C.	2 fair	„	?	„	
661	Hulme	R. N.	M.	26	„ 24	„ 21	„ 22	„ 25	„ 20	27	„	„	C.	2 good	„	- - -	„	Supposed at place of business.
662	Central	J. D.	M.	28	„ 25		Out of work.	„ 25	„ 27	34	„	„	C.	2 fair	„	?	„	
663	St. George's	A. B.	M.	21	„ 26	„ 22	May 20	„ 26	„ 20	26	Mild	„	C.	4 very good.	„	Cricket ground, near Monsall Hospital.	„	
664	„	M. H.	F.	10	„ 27	„ 25	3 weeks	„ 27	„ 24	29	„	„	C.	4 fair	„	Previous case	One	(Highly modified.)
665	„	J. A.	M.	12	„ 27	„ 24	May 1	„ 27	„ 27	32	„	„	C.	4 good	„	„	„	
666	Central	G. J.	M.	25	„ 28			„ 2	May 31	4	Hæmorrhagic.	Died	Unvaccinated		„	?	None	
667	St. George's	F. T.	M.	32	„ 28	„ 26	„ 26	„ 28	June 3	7	Confluent	„	Uncertain		„	?	„	
668	Crumpsall	T. McG.	M.	34	„ 30	„ 29		„ 30	„ 20	22	Semi-confluent.	„	C.	2 fair	„	Previous case	Three	Erysipelas.
669	Newton Heath	W. B.	M.	18	„ 30	„ 25	„ 27	„ 30	July 18	50	„	Recovered	C.	2 good	„	?	None	
670	Moston	R. D.	M.	16	„ 30	29	„ 18	„ 30	„ 4	36	Mild	„	C.	3 „	18 May, 1893, 2 vesicles.	Previous case	Two	

APPENDIX VIII.—*continued.*

No.	Sanitary District.	Name.	Sex.	Age.	Notification.	Rash.	Last at School or Work.	Admitted to Hospital.	Discharged from Hospital.	Duration in Hospital.	Type.	Result.	Vaccination. Date.	Vaccination. Character.	Re-vaccination.	Source of Infection.	Other Cases.	Remarks. (Probable Source of Infection.)
										Days.								
671	Cheetham	J. B.	M.	22	May 31	May 30	May 26	May 31	July 7	38	Semi-confluent.	Recovered	C.	3 good } 3 fair }	Not	?	None	
672	Crumpsall	G. J.	M.	64	„ 31	„ 31		„ 31	„ 21	52	„	„	C.	3 mod.	„	Previous case	Four	
673	„	T. W.	M.	45	„ 31	„ 31		„ 31					C.	2 „	„	„	Five	
674	Chorlton-on-Medlock	M. B.	M.	38	„ 31	„ 30	„ 29	„ 31	Aug. 1	63	Confluent	Recovered	C.	2 „	„	?	None	
675	St. George's	E. C.	F.	38	June 2	June 2		June 2		—	Discrete	—	C.	2 good	„	?	„	
676	„	B. J.	F.	34	„ 3	„ 1	„ 16	„ 3					C.	3 mod.	„	?	„	
677	Moston	A. E.	F.	31	„ 3	May 30		„ 3	June 4	22	Discrete	Recovered	C.	3 fair	„	12, Edward St.	„	
678	„	H. C.	M.	18	„ 3	June 1	„ 29	„ 3	„ 30	28	„	„	C.	3 good	„	„	„	
679	St. George's	J. W.	M.	43	„ 4	„ 4	June 3	„ 4	„ 30	27	Mild	„	C.	1 „	Yes, in the army.	Previous case	One	
680	Central	F. F.	F.	39	„ 5	„ 5	„ 3	„ 5	„ 10	6	Hæmorrhagic.	Died	Uncertain		Not	?	None	
681	St. George's	T. W.	M.	17	„ 5	„ 4	„	„ 5	„ 30	25	Mild	Recovered	C.	4 good	„	?	„	
682	Crumpsall	A. A.	M.	50	„ 5	„ 4		„ 4	July 14	41	Discrete	„	C.	3 mod.	On admission to workhouse.	Previous case	Six	
683	Moston	M. E.	F.	12	„ 5	3 weeks ago.	3 weeks before Whitweek.	„ 5	8	34	„	„	Unvaccinated		Not	Previous case	1	
684	Newton	H. P.	M.	55	„ 6	June 5	June 3	„ 6	June 13	8	Hæmorrhagic.	Died	Uncertain		„	?	None	
685	Moston	S. E.	F.	14	„ 7	„ 12	„ 3	„ 7	July 15	39	Discrete	Recovered	„		„	?	„	
686	St. George's	M. P.	F.	9	„ 8	„ 5	„ 2	„ 8					Unvaccinated		„	?	„	
687	Newton Heath	G. G.	M.	19	„ 8	May 25	„ 8	„ 8	July 4	27	Discrete	Recovered	C.	1 very good.	„	44, Beswick Street.	„	
688	„	C. G.	F.	33	„ 8	June 7	„ 8	„ 8					C.	1 good	„	Previous case	1	
689	„	S. P.	F.	46	„ 10	„ 10	„ 8	„ 10	Aug. 1	52	Semi-confluent.							
690	Openshaw	E. J.	F.	17	„ 10	„ 6	„ 5	„ 10	July 15	36	Confluent	Recovered	C.	2 very faint.	„	?	None	
691	„	M. B.	F.	21	„ 10	„ 9	„ 5	„ 10	„ 8	29	Mild		C.	3 fair	„	?	„	(Highly modified).
692	„	L. G.	M.	12	„ 10	„ 8	7 weeks	„ 10	„ 11	32	Discrete	„	C.	3 mod.	„	24, Wesley Street.	„	
693	Hulme	T. S.	M.	30	„ 10	„ 6	June 5	„ 10	„ 14	35	„	„	C.	3 fair	„	Previous case	2	
694	Crumpsall	F. A.	F.	19	„ 12	„ 12	„ 5	„ 12	June 24	13	„	„	C.	2 very good.	7th June	. . .	None	Place of business.
695	Moston	C. E.	F.	4	„ 12	„ 12	„ 5	„ 12			„	„	C.	4 good	Not	. . .	„	Visited friends at Eccles; 1st June attended a funeral.
696	„	F. E.	F.	4 mths.	„ 12	„ 12	„ 5	„ 12			„	„	Not vaccinated			Previous case	1	
697	„	L. B.	F.	25	„ 12	„ 3	„ 5	„ 12	July 25	44	Semi-confluent.					„	2	
698	„	A. E.	F.	2	„ 13	„ 12	„ 5	„ 13	„ 15	33	„	Recovered	C.	2 very faint.	„	2, Brown Street	None	
699	Newton Heath	J. B.	M.	28	„ 13	„ 12	„ 8	„ 13	„ 7	25	Discrete	„	Not vaccinated			Previous case	3	
											„	„	C.	2 faint	„	„	?None	

Appendix VIII.—*continued.*

No.	Sanitary District.	Name.	Sex.	Age.	Notification.	Rash.	Last at School or Work.	Admitted to Hospital.	Discharged from Hospital.	Duration in Hospital.	Type.	Result.	Vaccination.		Re-vaccination.	Source of Infection.	Other Cases.	Remarks. (Probable Source of Infection.)
													Date.	Character.				
										Days.								
700	St. George's	H. M.	F.	28	June 14	June 13	June 8	June 14			Discrete		C.	1 good	Not	29, Pickstone Street.	None	
701	„	J. B.	M.	11	„ 15	„ 14	„ 13	„ 15	July 14	30	Mild	Recovered	C.	3 very good.	„	?	„	(Highly modified).
702	„	A. P.	F.	21 mths.	„ 16	„ 12	„ 13	„ 16	„ 25	40	Discrete	„	Not vaccinated			?	„	
703	„	M. J. M.	F.	33	„ 16	„ 15	„ 10	„ 16	June 26	11	Hæmorrhagic.	Died	C.	2 very fair.	„	?	„	Abortion.
704	Moston	M. A. C.	F.	36	„ 16	„ 15	„ 13	„ 16					C.	2 very good.	„	2, Brown Street	„	
705	St. George's	S. P.	F.	40	„ 18	„ 18	„ 17	„ 18					C.	2 good	16th June 1893.	Previous case	1	
706	Central	W. H.	M.	26	„ 19			„ 19					C.	2 faint	Not	?		
707	St. George's	F. P.	F.	19	„ 19	„ 19	„ 17	„ 19	July 21	33	Discrete	Recovered	C.	4 good	17th June 1893.	Previous case	2	
708	Crumpsall	A. B.	M.	28	„ 19	„ 19	„ 17	„ 19					C.	2 very good.	Not	„	7	
709	„	J. H.	M.	34	„ 19	„ 19		„ 19					C.	3 good	„	„	8	
710	St. George's	T. W.	M.	28	„ 22	„ 21		„ 22	July 18	27	Mild	„	C.	1 „	„	„	3	
711	„	E. P.	F.	11	„ 22	„ 22		„ 22	Aug. 1	41	„	„	C.	4 „	„	„	4	
712	„	W. P.	M.	25	„ 27	„ 26	„ 24	„ 27					C.	3 „		„	1	
713	Newton Heath	A. S.	M.	27	July 4	July 2	„ 30	July 4					C.	1 „	„	„	None	
714	Moston	M. H.	F.	14	„ 10	„ 8	July 7	„ 10					Not vaccinated			?	„	
715	St. George's	F. P.	F.	13	„ 13	„ 11	„ 7	„ 13					C.	4 faint	„	?	„	
716	Harpurhey	A. E. R.	F.	34	„ 13	„ 12	„ 7	„ 13					C.	3 „	„	?	„	
717	Newton Heath	E. R.	F.	51	„ 13	„ 11	„ 7	„ 13					Not vaccinated			?	„	
718	„	W. T.	M.	19	„ 16	„ 16	6 weeks ago.	„ 16					C.	3 good		Previous case	1	
719	St. George's	R. W.	M.	54	„ 18	„ 18		„ 18					C.	2 „	„	?	None	
720	„	T. C.	M.	35	„ 22	„ 22		„ 22	July 26	5	Confluent	Died	C.	3 faint P. 3 „ S.	1878.	?	„	This man was a very heavy drinker, and had been drinking heavily before and during the incubation period.
721	„	J. G.	M.	44	Aug. 1	Aug. 1		Aug. 1			„		C.	3 good		11, Angel Street	23	
722	„	J. T.	M.	38	„ 5	„ 5		„ 5	Aug. 7	3	„	„	C.	2 „		„	24	
723	„	A. H.	F.	54	„ 10	„ 8		„ 10			Discrete		C.	1 „		?	None	

N.B.—In above list Nos. 313, 350, 454 are repeated. The total cases therefore amount to 720.

Man-chester.

APPENDIX IX.

No.	Sanitary District.	Name.	Sex.	Age.	Notification.	Rash.	Last at School or Work.	Admitted to Hospital.	Discharged from Hospital.	Duration in Hospital.	Type.	Result.	Vaccination.		Re-vaccination.	Source of Infection.	Other Cases.	Remarks. (Probable Source of Infection.)
													Date.	Character.				
										Days.								
1	Salford	F. M. J.	F.	16 mths.	Mar. 16	Mar. 15	Never	Mar. 16	May 13	59	Confluent	Recovered	Not vaccinated			- - -		Smith's, 39, Rugby Street, C'ham.
2	„	T. D. N.	M.	27 years.	„ 20		101, Broughton Lane.	„ 20	April 22	34	Discrete	„		2 cicatrices		- - -		Attending patient at 39, Rugby Street.
3	Failsworth	J. C.	M.	14		Aug. 22		Aug. 25			Mild		C.	4 good	Not	?	None	
4	„	S. A. C.	F.	17		„ 22		„ 25			Discrete		C.	3 „		Previous case 22 Aug.	1	
5	„	M. A.	F.	3		„ 22		„ 25	Nov. 1	69	Confluent	„	Unvaccinated			Previous case 22 Aug.		
6	„	M. H.	F.	35		„ 24		„ 26	Oct. 14	40	Discrete	„	C.	1 good	Not			
7	„	F. C.	F.	42		„ 25		„ 27	„ 17	52	Confluent	„	C.	1 mod.	„	Previous case 22 Aug.	2	
8		G. B.	M.	25		„ 26		„ 27	Sept. 27	32	Discrete	„	C.	3 good	„			
9	„	S. H.	M.	15		„ 26		„ 27	Oct. 4	39	„	„	C.	2 „	„			
10	„	G. B.	M.	65		„ 25		„ 30	Sept. 20	22	„	„	C.	3 mod. good	„	Previous case	1	
11	„	J. W. A.	M.	24		„ 28		„ 31	„ 30	31	„	„	C.	4 good	„	Previous case 22 Aug.	1	
12	„	J. K.	M.	58		Sept. 6		Sept. 6	„ 30	25	„	„	C.	2 mod.	„			
13	„	A. M.	F.	39		„ 7		„ 7	„ 9	3	Hæmorrhagic.	Died	C.	1 very poor	„			Miscarried.
14	„	H. H.	M.	25		„ 7		„ 7			Discrete		C.	2 good	„	Previous case	2	
15	„	M. W.	F.	31		)		„ 9			„		C.	3 mod.	„			
16	Salford	T. E. B.	M.	15	Sept. 18			„ 1	Oc 18	31	„	Recovered		2 good				
17	Urmston	F. A. W.	F.	7	„ 27	Oct. 15		„ 27	Nov. 4	39	Mild	„	Vaccinated for 1st time Oct. 8, 1892.	Successful in 2 places.				Vaccinated for 1st time Oct. 8, 1892. (Highly modified.)
18	Failsworth	H. K.	M.	1½	„ 27			„ 27	Oct. 3	7	Confluent	Died	Un-vaccinated					
19	Bedford Leigh	J. W.	M.	22	Oct. 15			„ 15	Nov. 29	76	Semi-confluent.	Recovered	Infancy	3 mod.	„	?		
20	Withington	A. J. V.	M.	30	„ 25			„ 25	Dec. 2	69	Mild	„	–	3 good	No.	?	None	
21	Failsworth	M. J. B.	F.	17	„ 26			„ 26	Nov. 22	58	Discrete	„		1 mod. primary	„	?		
22	„	R. H.	M.	30	Dec. 17			Dec. 17	Jan. 20	35	Semi-confluent.	„	Infancy	3 good	„			
23	Salford	R. H.	M.	31	„ 22			„ 22	Feb. 14	55	Confluent	„		3 poor				
24	„	S. A. B.	F.	35	„ 24			„ 24	Jan. 24	32	Discrete	„		1 good	„			
25	„	E. A.	M.	39	„ 29 1893.	Dec. 29 1893.		„ 29	Feb. 10	44	Semi-confluent.	„	C.	3 good primary	Not	?	„	
26	„	M. E. A.	F.	7	Jan. 10	Jan. 8		Jan. 10	Mar. 21	71	Discrete	„	Vaccinated successfully for first time Dec. 30th, 1892.					Vaccinated for 1st time Dec. 30th, 1892. It was successful in four places.
27	Failsworth	L. A.	F.	27	„ 10	„ 9		„ 10	Feb. 24	46	Confluent	„	Un-vaccinated					

APPENDIX IX.—*continued.*

No.	Sanitary Districts.	Name.	Sex.	Age.	Notification.	Rash.	Last at School or Work.	Admitted to Hospital.	D'scharged from Hospital.	Duration in Hospital.	Type.	Result.	Vaccination.		Re-vaccination.	Source of Infection.	Other Cases.	Remarks. (Probable Source of Infection.)
													Date.	Character.				
										Days.								
28	Failsworth	W. C.	M.	16	Jan. 12			Jan. 12	Feb. 7	27	Discrete	Recovered		3 fair				
29	Salford	J. W. K.	M.	29	„ 15			„ 15	„ 24	41	„	„		2 good				
30	Stretford	P. B.	F.	16	„ 15			„ 15	„ 28	45	„	„		2 very good				
31	Failsworth	E. H.	F.	2	„ 17			„ 17	Mar. 17	60	Semi-confluent.	„	Unvaccinated					
32	„	E. H.	M.	4	„ 17			„ 17	„ 17	60	Confluent	„	„					
33	„	A. H.	F.	5	„ 17			„ 17			Discrete		„					
34	Salford	S. H.	M.	20	„ 20			„ 20			Semi-confluent.			?no marks				
35	„	I. E. B.	F.	32	„ 20			„ 20	Mar. 10	50	Confluent	Recovered		2 good				
36	Pendlebury	A. A. M.	F.	27	„ 24			„ 24	„ 7	43	Discrete	„	C.	3 poor				
37	Moss Side	L. S.	F.	26	„ 24			„ 24	Apr. 4	71	Semi-confluent.	„	C.	3 fair				
38	Withington	G. E. G.	M.	40	„ 26			„ 26	Jan. 30	5	Hæmorrhagic.	Died	Unvaccinated					
39	Failsworth	G. D. M.	M.	44	„ 28			„ 28	Mar. 7	39	Discrete	„	C.	4 good				
40	„	S. H.	M.	53	„ 28			„ 28	Feb. 21	25	Mild	„	C.	2 very fair.				
41	„	B. H.	F.	23	„ 28			„ 28	„ 21	25	„	„	C.	4 good				
42	„	F. H.	F.	15	„ 28			„ 28	Mar. 10	42	Discrete	„	C.	2 „				
43	„	Ethel H.	F.	10	„ 28			„ 28	Feb. 28	32	Mild	„	C.	2 „				
44	„	J. D.	M.	36	„ 30			„ 30	„ 28	30	Discrete	„	C.	2 very good.				
45	Moss Side	R. W.	M.	38	„ 31			„ 31	Mar. 7	36	„	„	C.	2 fair				
46	Failsworth	J. C.	F.	33	„ 31			„ 31	„ 28	57	„	„	C.	3 „				
47	„	A. B.	M.	4	„ 31			„ 31	„ 21	50	„	„	Unvaccinated					
48	„	T. H. D.	M.	21	„ 31			„ 31	„ 7	36	Mild	„	C.	4 very good.				
49	„	M. M.	F.	20	Feb. 1			Feb. 1	„ 14	42	Discrete	„	Unvaccinated			?		
50	„	H. H.	M.	17	„ 1			„ 1	Feb. 28	28	Mild	„	C.	4 very fair.				
51	Didsbury	J. C.	M.	34	„ 10			„ 10	Mar. 17	36	„	„	C.	1 good	Jan. 30, '93, successfully, 4 good.			
52	Failsworth	S. D.	F.	33	„ 13			„ 13	Apr. 4	51	Confluent	„	C.	1 good				
53	Moss Side	M. E. W.	M.	21	„ 21			„ 21	Mar. 28	36	Discrete	„		1 very good.				
54	„	J. D.	M.	48	„ 24			„ 24	„ 28	33	„	„		1 poor				
55	„	F. G.	M.	20	„ 25			„ 25	Apr. 11	46	„	„		3 good				
56	Failsworth	J. B.	M.	42	„ 27			„ 27	Mar. 21	23	„	„	C.	2 mod.				
57	Gorton	G. L.	M.	8	Mar. 9			Mar. 9	May 2	55	Confluent	„	Unvaccinated					

APPENDIX IX.—*continued.*

No.	Sanitary District.	Name.	Sex.	Age.	Notification.	Rash.	Last at School or Work.	Admitted to Hospital.	Discharged from Hospital.	Duration in Hospital.	Types.	Result.	Vaccination.		Re-vaccination.	Source of Infection.	Other Cases.	Remarks. (Probable Source of Infection.)
													Date.	Character.				
										Days.								
58	Swinton	W. B.	M.	44	Mar. 12			Mar. 12	Mar. 20	9	Confluent	Died	C.	2 faint				
59	Stretford	W. B.	M.	26	„ 22			„ 22	Apr. 18	28	Mild	Recovered	C.	2 good				
60	Chorlton-cum-Hardy	T. H.	M.	36	„ 23			„ 23			Confluent		C.	3 faint				
61	Swinton	W. Y.	M.	9 mo.	„ 25			„ 25	May 2	39	Discrete	Recovered	Unvaccinated			Previous case	1	
62	Withington	W. F.	M.					„ 27	Apr. 25	30	„	„		3 faint p. cicatrices		?	None	
63	Swinton	W. H. B.	M.	20	Mar. 31			„ 31	May 5	36	Semi-confluent.	„	C.	2 very good.		Previous case	2	
64	„	A. B.	F.	1	„ 31			„ 31	„ 2	33	Discrete	„	Unvaccinated			„	3	
65	Withington	J. H.	M.	38	Apr. 6			Apr. 6	„ 9	34	„	„	C.	2 good				
66	Didsbury	T. H. C.	M.	24	„ 2			„ 2	„ 2	31	„	„	C.	1				
67	Salford	J. S.	M.	25	„ 3			„ 3	„ 5	33	„	„	C.	2 good				
68	Withington	F. C.	M.	4	„ 3			„ 3	„ 25	53	„	„	Unvaccinated					
69	Didsbury	E. M. C.	F.	20	„ 4			„ 4	„ 2	29	Mild	„	C.	4 good				
70	Failsworth	S. B.	M.	29	„ 4			„ 4			Discrete		C.	4 „				
71	Withington	S. A. C.	F.	28	„ 13	Apr. 13		„ 13			Mild		Vaccinated successfully on April 3rd in 2 places.					Vaccinated for first time on Apr 3rd successfully in 2 places.
72	„	L. S.	F.	21	„ 13	„ 13		„ 13	May 12	30	„	Recovered	Vaccinated successfully on April 3rd for first time.					Vaccinated for first time Apr. 3rd, 1893 successful in 2 places.
73	„	C. C.	M.	5	„ 13			„ 13			„		C.	3 good				(Highly modified.)
74	Stretford	W. F. T.	M.	30	„ 24			„ 24			„		C.	3 mod.	Jan. 1893 unsuccessfully, and 12 years ago unsuccessfully.			„ „
75	„	K. H. T.	F.	2	„ 24			„ 24			Discrete		3 unsuccessful attempts, unvaccinated.			Previous case	1	
76	„	C. E. T.	F.	5	„ 24			„ 24	May 1	8	Confluent	Died				„	2	
77	Moss Side	W. B.	M.	14	May 7			May 7			„		Unvaccinated; vaccinated during incubation.					
78	Stretford	M. P.	F.	22	„ 10			„ 10			„		C.	3 good				
79	Sale	J. A.	M.		„ 11			„ 11			Discrete		C.	1 „				
80	Stretford	A. H.	F.	33	„ 11			„ 11			„		C.	3 „				
81	„	J. H.	M.	27	„ 11			„ 11			„		C.	3 „				
82	„	S. A.	M.	22	„ 11			„ 11			Mild		C.	3 very good.				
83	Withington	W. H. E.	M.	58	„ 11			„ 11			Confluent		C.	3 mod.				
84	Moss Side	J. B.	M.	45	„ 19			„ 19	May 24	6	„	Died	C.	2 good	Not			

APPENDIX IX.—*continued.*

No.	Sanitary District.	Name.	Sex.	Age.	Notification.	Rash.	Last at School or Work.	Admitted to Hospital.	Discharged from Hospital.	Duration in Hospital.	Types.	Result.	Vaccination.		Re-vaccination.	Source of Infection.	Other Cases.	Remarks. (Probable Source of Infection.)
													Date.	Character.				
85	Stretford	E. M.	F.	27	May 29			May 29		days	Mild		C.	4 good				
86	Swinton	E. R.	F.	28	" 22			" 22			Discrete		C.	3 mod.				
87	Withington	M. W.	M.	26	" 24			" 24	June 1	9	Confluent	Died	C.	1 very good.				
88	"	T. J.	M.	29	" 23			" 23	" 3	12	"	"	Unvaccinated					
89	Swinton	M. J. C.	F.	7 mths.	" 28			" 28	" 1	7	Discrete	"						
90	Wilmslow	J. P.	M.	33 years.	June 5			June 5			Mild		C.	1 good	Not		None	Brother died of small pox in Monsall Hospital, 1st May 1895. Morbilli sine catarrho.
91	Ashton-upon-Mersey	M. M.	F.	32	" 10			" 10					C.	1 mod.				
92	Runcorn	W. J. P.	M.	23				" 11			Semi-confluent. Mild		C.	3 good				
93	Withington	F. C. D.	M.	22				" 17					C.	3 very good.				
94	Radcliffe	J. S.	M.	23				" 23					?					25, Sanderson Street.
95	Urmston	N. P.	F.	15	June 23			" 23					C.	4 very good.				
96	Withington	M. H.	F.	29	" 27			" 27					Unvaccinated					Brother-in-law removed to Monsall, 19th June 1895.
97	"	H. H.	M.	21	" 29			" 29					C.	1 faint				
98	Gorton	S. E. P.	F.	24	July 15			July 15					C.	4 "		Wife		

MANCHESTER.

APPENDIX X.

Cautionary Handbill by Medical Officer of Health re Small-pox and Vaccination.

CITY OF MANCHESTER.

SMALL-POX.

The Medical Officer of Health gives notice that small-pox has for some time past been prevalent in several districts round Manchester, and that many cases of the disease have already been reported in the city itself.

So many years have now elapsed since this disease was last prevalent in Manchester, that comparatively few people would now recognise a case of small-pox if they saw one.

It may therefore be well to give, in plain language, a short description of the disease so as to assist in its detection, and thus secure the calling in of medical aid and the early and prompt removal of infected persons to hospital.

On or about the *thirteenth day* after exposure to infection, a person who has caught small-pox begins, perhaps suddenly, to feel dull and heavy, with pains in the head and limbs, and especially in the loins. Sometimes invasion sets in with a severe "shivering fit." In many instances he vomits, and in all, except the most trivial cases, he feels prostrate and wretchedly ill.

On or about the *third day of illness* pimples begin to appear on the face and head, especially on the forehead, about the wrists, and other parts of the body. The pimples are hard to the touch, and feel like pellets of shot under the skin; they grow steadily larger, and by the fifth day are filled with fluid, which soon becomes opaque, yellow, and "matter" like. By the eleventh day most of the "pocks" have burst, and scabs then begin to form on the top of them. In mild cases only a few of these "pocks" may be present, but in even a moderately severe attack they cover the face so as to greatly distort the features, and in a really severe or confluent case the patient's appearance is very repulsive. Long before this stage has been reached, however, medical assistance will of course have been obtained, and the patient removed to hospital.

If small-pox is suspected to be present in a house a doctor should at once be summoned. The nearest doctor will attend if called upon, and any of the sanitary inspectors or female district visitors will promptly obtain the services of one, if requested so to do.

The Medical Officer of Health earnestly draws attention to the following considerations:—

> Small-pox unmodified by vaccination is the most frightful disease to which mankind is subject. It is as deadly a disease now as ever it was, and is as capable as ever of causing terrible disfigurement, blindness, deafness, &c., in those cases where, happily, death does not ensue. When attacked by small-pox about half of the unvaccinated infants die, and amongst persons above the age of 30 years the fatality is even greater than this.
>
> Cleanliness is, of course, important at all times; but the most perfect cleanliness will not protect from small-pox. The only sure preventive is vaccination, which must be performed in infancy, and ought always to be *repeated once* as soon as the tenth year has passed.
>
> The public are urged to secure their own re-vaccination and that of their families *before small-pox becomes prevalent amongst us*, for as soon as that comes to pass, everyone will want to be vaccinated at once, and the public vaccinators will be unable to meet the demand for the necessary supply of lymph. This has recently been the experience in a neighbouring town, where quite recently the supply of lymph ran short, and the doctors were unable, for a time, to keep pace with the demand for vaccination.

As small-pox is so intensely infectious, it is necessary that extraordinary precautions should be taken against its spread. The Medical Officer of Health therefore issues the following memorandum and warning against practices which are likely to lead to the spread of the disease:—

1. If you suspect small-pox to exist in your house, you are bound forthwith to inform the Medical Officer of Health of the fact. Call in a doctor at once, and he will report the case for you; but you cannot escape the penalty for neglect to report the case by refusing to call in a doctor, *and you will certainly be prosecuted if you neglect your duty in this particular.*
2. As soon as the patient is removed, your house and its contents, together with all infected bedding and clothing, will be disinfected by the sanitary officers; and as soon as you have been re-vaccinated, you may safely return to your business.
3. On no account must children be sent to school from a house in which there is a case of small-pox. It is a punishable offence to send a child to school from an infected house, for this would almost certainly lead to the spread of small-pox amongst the scholars.
4. It is illegal for a small-pox patient to be conveyed in a cab, or tram, or omnibus, or in a train, or other public conveyance. Proper ambulances are provided by the Corporation for the purpose of removing infectious patients to hospital, and the use of these may be obtained without payment, on application at the Town Hall, or at the Cleansing Committee's yard in Oldham Road. The sanitary inspector or the female health visitor of your district will promptly obtain one for you if you will inform him or her of your need.
5. It is likewise illegal to remove infected bedding or clothing before it has been disinfected; therefore you must give notice, and have it removed and disinfected by the Corporation, which will be done free of cost.

(Signed) JOHN TATHAM, M.D.,
Medical Officer of Health.

Vaccination and Re-vaccination will be performed free of charge at the following places and times:—

MANCHESTER UNION.

Public Vaccinators.	Vaccination Stations.	Days and Hours of Attendance.
Dr. THOMAS PRICE	Ardwick and Ancoats Dispensary, Mill Street.	Every Wednesday, at 2 p.m.
Dr. ELLIS S. GUEST	87, Rochdale Road	Every Monday, at 2 p.m.
Dr. J. B. MANN	Royal Infirmary (Parker Street entrance).	Every Tuesday, at 2 p.m.

CHORLTON UNION.

Public Vaccinators.	Vaccination Stations.	Days and Hours of Attendance.
Dr. SAM WOODCOCK	220, City Road, Hulme	Every Wednesday, at 3 p.m.
Dr. A. HADEN GUEST	131, Embden Street, Hulme.	Every Thursday, at 3 p.m.
Dr. WILLIAM DAVIES	Chorlton-upon-Medlock Dispensary, Cavendish Street, Chorlton-upon-Medlock.	Every Tuesday, at 3 p.m.
Dr. JOSEPH FOSTER	121, Rusholme Road, Chorlton-upon-Medlock.	Every Monday, at 3 p.m.
Dr. JOHN WATSON	Town Hall, Ardwick Green.	Every Wednesday, at 2 p.m.
Dr. HARRY E. HACKET	589, Hyde Road, Gorton.	Every Thursday, at 2 p.m.
Dr. EDWIN E. JONES	346, Ashton Old Road, Openshaw.	Every Thursday, at 3 p.m.
Dr. HARRY E. H. MATTHEWS.	13, Richmond Grove East, Longsight.	Every Tuesday, at 3 p.m.
Dr. GEORGE R. GOWLAND.	139, Wilmslow Road, Rusholme.	Every Wednesday, at 2 p.m.

PRESTWICH UNION.

Public Vaccinators.	Vaccination Stations.	Days and Hours of Attendance.
Dr. C. G. L. SKINNER	Mrs. Hall's, Chapel Place, Blackley.	2nd, 3rd, and 4th Tuesdays,* at 2 p.m.
Dr. C. G. L. SKINNER	Methodist Free Church, Crumpsall.	2nd, 3rd, and 4th Tuesdays* at 3 p.m.
Dr. C. G. L. SKINNER	Conservative Club, Harpurhey.	1st, 2nd, 3rd, and 4th Tuesdays,* at 10 a.m.
Dr. JOHN HUDSON	Liberal Club, Bradford	Every Wednesday, at 3 p.m.
Dr. R. G. GORNALL	Primitive Methodist School, Hall Street, Newton Heath.	Every Wednesday, at 2 p.m.
Dr. R. G. GORNALL	Bethel New School, Failsworth.	Every Tuesday, at 10 a.m.
Dr. R. G. GORNALL	Wilson Street School, Miles Platting.	Every Wednesday, at 3.30 p.m.
Dr. J. G. DOWSE	The Surgery, 2, Newton Avenue, Stockport Road, Kirkmanshulme.	1st, 2nd, 3rd, and 4th Tuesdays,* at 2 p.m.
Dr. C. F. H. KITCHEN	Cheetham Town Hall	Every Thursday, at 3.30 p.m.

* In the months of January, April, July, and October.

APPENDIX XI.

Township of Manchester.

Weekly Returns* of Vaccinations performed by the Public Vaccinators.

Week ending	Primary vaccinations.	Re-vaccinations.	Corresponding Weeks in the under-mentioned Years.					
			1891-92.		1890-91.		1889-90.	
			Primary vaccinations.	Re-vaccinations.	Primary vaccinations.	Re-vaccinations.	Primary vaccinations.	Re-vaccinations.
1892.								
October 1	61	1	48	—	47	—	53	—
„ 8	61	8	60	—	47	—	67	—
„ 15	52	7	46	—	65	—	47	—
„ 22	47	4	63	—	43	—	62	—
„ 29	52	1	57	—	54	—	45	—
November 5	35	—	52	—	45	—	42	—
„ 12	43	—	42	—	54	—	70	—
„ 19	40	—	44	—	61	—	67	—
„ 26	48	8	58	—	47	—	54	—
December 3	48	4	39	—	39	—	43	—
„ 10	29	1	51	—	52	—	54	—
„ 17	48	—	29	—	39	—	47	—
„ 24	23	6	6	—	14	—	14	—
Totals for Quarter	587	40	595	—	607	—	665	—
1892.								
December 31	16	—	22	—	27	—	22	—
1893.								
January 7	24	19	49	—	57	—	94	—
„ 14	53	9	56	—	68	—	77	—
„ 21	61	34	55	—	46	—	70	—

* Furnished by Mr. G. Macdonald, Clerk to the Guardians.

Township of Manchester.

Return of the Number of Persons vaccinated by the Medical Officers of the Workhouse and the Swinton Schools, and by the Public Vaccinators during the Year ended 29th September 1892.

Vaccination Districts.	Number of Successful Primary Vaccinations.	Number of Successful Re-Vaccinations.
Crumpsall Workhouse	144	1
Swinton Schools	7	234
Ancoats District	1,003	2
St. George District	821	2
Central District	541	61
	2,516	300

Additional Return since September 29, 1892.

Workhouse.—Primary vaccinations, 47. Re-vaccinations, 180.
Swinton Schools - - - Re-vaccinations, 298.

Mr. Macdonald in making this return (letter dated January 25, 1893), adds that "the average number of children in "the Swinton Schools during the period over which the Returns extend were about 690 of whom it will be seen no "fewer than 532 were re-vaccinated."

CHORLTON UNION.

RETURN of VACCINATIONS furnished by Mr. D. S. Bloomfield, Clerk to the Guardians.

Period.	Vaccination Officer.	Registration Sub-Districts comprised in the Vaccination Officer's District.	Number of Births returned in the "Birth List Sheets" as registered from the 1st of January to the 31st December 1891, and 1st January to 31st June 1892.	Number of these Births duly entered by 31st January 1893, in Columns 10, 11, and 13 of the "Vaccination Register" Birth List Sheets, viz.:—					Number of these Births which on 31st January 1893 remained unentered in the Vaccination Register on account (as shown by Report Book) of—			Number of these Births remaining on 31st January 1893, neither duly entered in the "Vaccination Register" (Columns 3, 4, 5, and 6 of this Return) nor temporarily accounted for in the "Report Book." Columns 8, 9, and 10 of this Return.
				Column 10. Successfully Vaccinated.	Column 11. "Insusceptible of Vaccination."	Column 11. Had Small-pox.	Col. 13. Dead, Unvaccinated.	(This Column to be left Blank.)	Postponement by Medical Certificate.	Removal to Districts the Vaccination Officer of which has been duly apprized.	Removal to Places unknown, or which cannot be reached, and cases not having been found.	
		1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1st January to 31st December 1891 -	John A. Dawson	Chorlton-upon-Medlock -	1,640	1,220	2		207		65	34	112	
		Hulme - - -	3,042	2,429	10		350		70	40	143	
	William Hadfield	Ardwick - - -	4,083	3,138			556		70	58	230	31
		Didsbury - - -	681	511			91		16	10	44	9
1st January to 30th June 1892 - -	John A. Dawson	Chorlton-upon-Medlock -	808	577	2		108		23	22	33	43
		Hulme - - -	1,478	1,164	4		150		30	12	80	38
	William Hadfield	Ardwick - - -	2,082	1,507			221		41	23	256	34
		Didsbury - - -	304	219			30		10	4	33	8
		Total - -	14,118	10,765			1,713		325	203	931	

ADDITIONAL RETURNS OF VACCINATION and RE-VACCINATION by the Public Vaccinators of the Chorlton Union during the first three weeks of January 1893.

Public Vaccinator.	Primary Vaccinations.	Re-vaccinations.
Dr. Woodcock	31	1
Dr. Haden Guest	26	7
Dr. William Davies	21	0
Dr. Joseph Foster	10	4
Dr. H. E. Hackett	25	6
Dr. E. E. Jones	18	3
Dr. H. E. H. Matthews	6	0
Dr. G. R. Gowland	14	9
Dr. G. Watson	27	16
Dr. Massiah	8	1
Dr. Graydon	17	1

Dr. Woodcock, writing under date Jannary 24th, 1893, says:—"I have only done one re-vaccination at the public "station (*i.e.*, since January 1), and that was on the 18th, "and the woman said she submitted to the operation "only because her employer refused her permission to "enter his house until she had been re-vaccinated. There "is this week, *i.e.*, *to-day*, a demand for re-vaccination on "the part of private patients, but so far there is nothing "like the demand made previously when small-pox has "been rife."

Dr. Haden Guest says (January 23rd, 1893):—"I am "of opinion that the demand for re-vaccination has "increased during the last few weeks. Some persons get "re-vaccinated because they are afraid of small-pox, and "some only because their employers order them to be "done."

Dr. William Davies says (January 21st, 1893):—"In "my Union and Public Vaccination District I can "certainly say there has been no demand for re-vaccina-"tion."

Dr. Joseph Foster says (January 21st, 1893):—"So far "as my district is concerned there has been little demand "for re-vaccinations, much less than in previous out-"breaks of small-pox."

Dr. E. E. Jones says (January 22nd, 1893):—"Up to "January 19th, 1893, there had not been a single "applicant for re-vaccination; on that date a case of "small-pox was reported in the district, which accounts "for the three persons re-vaccinated on that day."

Dr. Matthews says (January 21st, 1893):—"I have "had no re-vaccinations in public, but amongst my "private patients, especially the better class, I have re-"vaccinated about 30. This number and about half-a-"dozen who have come to the surgery—not in my district "—have come solely on account of the notices about the "spread of small-pox."

Dr. Garland says (January 21st, 1893):—"The demand "for re-vaccination is almost *nil*, but since the sudden "rise in the number of small-pox cases three out-"siders and my household have been re-vaccinated, "and I quite anticipate a further demand if the disease "increases."

Dr. Watson says (January 22nd, 1893):—"On the 7th "inst. I re-vaccinated a woman and child, whose husband "had been taken to hospital the previous day suffering from "small-pox. This was the first re-vaccination I had "had for more than twelve months. During the last "week I have re-vaccinated 16, including six of my own "friends. I consider there is great reluctance on the "part of the public to be re-vaccinated, and one large "employer told me he had promised to pay any workmen "for any loss of time occasioned by the operation, but not "one has responded."

Dr. Massiah says (January 21st, 1893):—That he had 12 re-vaccinations during the three weeks in his private practice, and that the demand was increasing.

Dr. Mumford, of the Chorlton-cum-Hardy district, writes (January 22nd, 1893):—"I am sorry to say the "people have not availed themselves of the opportunity "for re vaccination at all; there have been no applicants "since November."

Prestwich Union.

RETURN of VACCINATIONS furnished by Mr. E. W. Ogden, Clerk to the Guardians.

CHEETHAM DISTRICT.

Number of Births.	Successfully vaccinated.	Insusceptible.	Dead; Unvaccinated.	Postponed.	Removals; V. O. apprized.	Removals; Places Unknown.	Number remaining.
1,260	901	1	66	23	—	269	—

NEWTON DISTRICT.

Number of Births.	Successfully vaccinated.	Insusceptible.	Dead; Unvaccinated.	Postponed.	Removals; V. O. apprized.	Removals; Places Unknown.	Number remaining.
1,249	1,032	2	120	12	5	74	4

MAN CHESTER.

APPENDIX XII.

MANCHESTER UNION.

VACCINATION RETURNS, 1872-1892.

Year.	Births registered during year.	Of the children whose Births were Registered during the Year given in the First Column, by the 31st January in the Year next but one following that year there were.						
		Successfully Vaccinated.	Certified as insusceptible of Vaccination.	Had Small-pox.	Died Unvaccinated.	Vaccination postponed by Medical Certificate.	Remaining.	The Children not finally accounted for (including cases postponed) being per cent. of Births.
1872	7,010	5,893	2	1	828	286		4·1
1873	6,797	5,726	4	2	805	4	256	3·8
1874	6,809	5,703	4	0	825	16	261	4·1
1875	6,908	5,798	4	0	829	33	244	4·0
1876	6,783	5,663	5	1	778	54	282	5·0
1877	6,546	5,501	3	3	695	54	290	5·3
1878	6,349	5,218	1	0	751	59	320	6·0
1879	5,983	4,907	4	0	609	104	359	7·7
1880	5,637	4,526	1	0	621	29	460	8·7
1881	5,428	4,479	1	0	576	25	347	6·9
1882	5,350	4,543	6	0	607	21	173	3·6
1883	5,313	4,544	4	0	562	35	168	3·8
1884	5,371	4,539	2	1	638	31	160	3·6
1885	5,273	4,454	8	1	624	59	127	3·5
1886	5,376	4,481	6	0	671	57	161	4·1
1887	5,292	4,448	6	0	653	52	133	3·5
1888	5,127	4,298	7	0	621	51	150	3·9
1889	5,207	4,328	6	0	642	65	166	4·4
1890	5,108	4,190	3	0	664	74	177	4·9
1891	5,076	4,180	3	0	715	37	141	3·5
1892	5,049	4,308	3	0	607	35	96	2·6

V.—Reports on the Prevalence of Small-pox at Oldham and Chadderton, 1892-93.

A.—REPORT ON THE PREVALENCE OF SMALL-POX AT OLDHAM, 1892-93.

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Conclusion.

§ 1.—*Oldham : Area, Population, Zymotic Disease, &c.*

The area of Oldham is 4,725 acres or nearly 7·4 square miles. Its population at the census of 1891 was 132,010, and the estimated population in 1892 was 134,221, giving a density of 28·4 persons per acre. The average annual increase of births over deaths during the past 12 years is about 1,200, but in the years 1890-92 it has been much below this number. The birth rate in 1892 was 28·9 per 1,000, the average for the past 12 years being 33·8, a figure it has not attained since 1887. The death rate in 1892 was 21·9 per 1,000, the average for the past 12 years being 23·8, the years of highest mortality within this period being 1884 (25·9), 1887 (25·8), and 1891 (25·6).

The appended Table I.—compiled from statistics published in the Medical Officer's Annual Report for 1891, with the addition, kindly made by him, of the figures for 1892—shows the zymotic incidence in the borough since 1881. Notification was adopted in 1880, so that the figures as to the number of cases occurring are all those which are known to the authorities. It will be seen that the years 1887 and 1888 stand out conspicuously for their excess in prevalence of these diseases, a position largely due to the marked prevalence of scarlet fever during those years. The zymotic death rate (from seven principal zymotic diseases) has varied from 1·5 per 1,000 in 1883 to 4·5 in 1887. Last year (1892) it was 2·6, which is about the mean rate for the 12 years.

TABLE I.

Oldham : Zymotic Disease, 1891-92.

Cases known to Medical Officer.

Year.	Population.	Small-pox.	Scarlet Fever.	Diphtheria.	Typhus.	Typhoid.	Total.
1881	112,176	15	434	20	—	131	600
1882	114,017	13	465	27	—	117	622
1883	115,888	6	301	15	—	96	418
1884	117,791	2	289	20	1	100	412
1885	119,724	4	229	28	—	58	319
1886	121,690	5	391	44	12	100	552
1887	123,687	8	1,775	127	2	119	2,626
1888	125,717	104	985	86	—	106	1,281
1889	127,781	1	689	39	—	56	776
1890	129,878	—	320	11	2	63	396
1891	132,010	—	238	29	—	112	379
1892	134,221	75	667	27	—	83	852

Deaths.

Year.	Small-pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping Cough.	Typhus and Typhoid.	Total.
1881	9	7	87	10	36	39	188
1882	4	69	58	10	77	26	244
1883	2	6	21	9	38	26	102
1884	—	193	33	7	36	22	291
1885	—	54	20	14	104	18	210
1886	—	89	32	29	57	30	237
1887	—	176	103	62	100	25	466
1888	13	53	66	36	40	24	232
1889	—	126	54	16	127	20	343
1890	—	95	25	6	82	15	223
1891	—	97	25	18	71	27	238
1892	15	139	42	18	68	16	298

OLDHAM.

Small-pox, 1887–8.

It will be seen that, with the exception of 1890 and 1891, there has not been a year in this period free from small-pox, but in only two years—viz., 1888 and 1892—did it attain the proportions of an epidemic. The first of these outbreaks commenced in Oldham in December 1887, in the person of "a child who was removed to "Westhulme Hospital on account of scarlet fever, "and five days after developed modified small-pox. "Shortly thereafter several cases were brought to the "hospital as follows:—(1) A—— H——, æt. 33, a tramp "from the Beever Street lodging-house, *viâ* work-"house, admitted December 24, eruption about Decem-"ber 23, a severe case; (2) V—— S——, Chamber "Road, æt. 23, about two miles from the hospital, "contracted disease from A—— H——, at the work-"house, severe case, admitted January 9, eruption "about January 8; (3) J—— K——, æt. 46, from the "workhouse, contracted disease from A—— H——, at "workhouse, severe case; (4) F—— K——, æt. 4, just "arrived from Sheffield with unmodified small-pox, "out for some days, removed on January 16, 1888."* This outbreak is of especial interest from the suspicion aroused as to the possible share taken in its diffusion by the proximity of the Westhulme Hospital, a question which has again arisen in connexion with the present outbreak (v. *infra*, Small-pox at Chadderton). Dr. Niven furnished me with a map showing the distribution of these cases in relation to the hospital and to a lodging-house in the centre of the town; and in an exhaustive inquiry which he personally made at the time he proved that the allegation of infection from the hospital could hardly be sustained.

§ 2. *Sanitary Administration.*

Sanitary authorities.

The sanitary administration of Oldham is in the hands of a committee of the town council, of which also there is a hospital sub-committee. The Medical Officer of Health is James Niven, M.A., M.B., B.C. Camb., and his staff consists of a chief sanitary inspector, with four assistant inspectors, and a smoke inspector (under the Factory and Workshops Act). During the past 12 months an additional assistant inspector has been appointed for house inspection.

Sanitary districts.

The borough is divided, according to density of population, into four sanitary districts, which are assigned to each of the assistant inspectors. On receipt of notification† of a case of infectious disease the inspector of the district concerned visits the house, and obtains particulars of the case which he enters in a note-book provided for that purpose. The patient is then removed to hospital, but in the case of small-pox the medical officer of health almost invariably visits the case before its removal, which is effected by the borough ambulance.

Measures taken in cases of small-pox.

It may be remarked that so far only one patient in the present small-pox outbreak has refused to go to hospital. He was isolated at home and nursed by his wife's mother, his wife being sent away.

It is noteworthy that only nine instances of occurrence of small-pox amongst the inmates of infected households, subsequent to the removal of the first case, have known to arise during this epidemic.

The work of disinfection of the house is placed in the hands of a special assistant, whose duty it also is to drive the ambulance. The rooms are fumigated with sulphur; the walls stripped and washed down with disinfectant, or cleansed with bread crumbs. The householders are instructed not to re-paper the walls until a fortnight has elapsed. The ceilings, &c., are whitewashed.

All loose articles, bedding, clothing, &c. are removed by the authorities to the disinfector, which is situated in a different part of the town to the hospital. The "disinfector" is a hot-air apparatus, but this will soon be replaced by a steam-disinfector.

Temporary isolation of inmates of infected houses.

As regards measures taken to ensure comparative isolation of infected households, there is no very rigid plan adopted. Thus in the case of those engaged in work, they are allowed (after disinfection) to follow their employment up to a stated period, when if infected from the case which has been removed, they might be suffered to develop the disease, about 10 to 15 days from the date of removal, and then they are advised to stay away from work altogether for a few days. This measure is taken where the case has been removed as soon as possible after the attack has become manifest; and so far as I could ascertain no ill effects had resulted from affording the people so much liberty. No member of the household is, however, permitted to get about until after the disinfection and cleansing has been completed. It is interesting in this connexion to note that the "workers" attacked with small-pox have been employed at different mills, there being only one instance of two workers at the same mill having been attacked, and these two cases were not connected with one another. But during most of the months of small-pox prevalence there has been a cotton strike, and the mill-hands have been kept at home. Since they have in consequence had much time to spend in moving about and visiting different houses and places, the strike has probably tended to increase the spread of the disease.

Children attending school are not compelled to stay away except in the "infective period," but as a matter of fact they are kept from school for a fortnight, and this advice is generally given by the inspector to the parents.*

Westhulme Hospital.

The Westhulme Hospital stands on about an acre of land at the north-western extremity of the borough.† It was erected in 1877 when small-pox was prevalent, but by the time that it was completed the epidemic had almost ceased. It originally comprised a one-storied wooden building on brick foundations, consisting of a long corridor, on one side of which are the administrative departments, and on the other, projecting at right angles, three ward-pavilions, each ward being 50 feet long and 27 feet broad, and each containing eight beds. Since then a two-storied block detached from the rest, and containing two large wards on each floor, has been erected; this building being built of brick.

Dr. Niven is the Medical Superintendent of the Hospital, which not only receives cases from the borough, but also from other adjacent districts (on payment), notably from Chadderton.

Although the hospital stands on the outskirts of the borough, the houses both of Oldham and Chadderton (especially the latter) fringe its grounds, coming to within 200 yards of the building.

It is chiefly devoted to the reception of cases of scarlet fever and typhoid fever, one ward, the furthermost from the entrance, being ordinarily set apart for small-pox. When, however, the present outbreak of small-pox occurred for a time fever cases were restricted to the commodious detached (permanent) building, and the original block given up to small-pox. More recently the large increase in the number of cases of small-pox has necessitated the devotion of these wards to it, and the exclusion of fever cases. At the time of my visit the pavilion-wards were mainly occupied by convalescent cases, the two large wards on the ground floor of the "fever block" being filled with acute cases of small-pox.

§ 3. *Vaccination at Oldham.*

The Vaccination Acts are no longer being enforced in Oldham, where the Board of Guardians is opposed to the practice. It was mentioned to me by Dr. Platt, one of the two Public Vaccinators of the borough, that for nearly six months there had been no Vaccination Officer, the previous holder of that office having then died, and the present occupant having only just been appointed. Dr. Platt assured me, by reference to his registers, that since 1890 the amount of public vaccination performed by him had been very small, practically reduced to *nil* during the past two years. The subjoined returns which he and his colleague, Dr. G. Thomson, have kindly furnished me show this in a striking manner:—

* From a paper (reprinted from the Medical Chronicle, April 1889) "On Cases of Small-pox occurring in 1888, near the Westhulme Hospital, Oldham," by James Niven, Medical Officer of Health for Oldham.

† Notification of infectious diseases has been in force since 1890.

* It is intended to notify schools and workshops of the presence of small-pox in a house whence children and workers come; but it has not hitherto been done. Cases of scarlet fever are notified to the School Board. The public libraries are *not* notified.

† A full description of this hospital will be found in the supplement to the Tenth Annual Report of the Local Government Board, 1880-81, "Report on the Use and Influence of Hospitals for Infectious Diseases," p. 214. I am indebted to this report for the details given here.

TABLE II.

Borough of Oldham.

NUMBER of PUBLIC PRIMARY VACCINATIONS performed by Dr. PLATT during the following Years.

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Totals.
1888 - -	7	13	21	23	25	17	22	4	27	3	14	10	182
1889 - -	9	14	3	19	11	3	15	5	10	2	8	9	108
1890 - -	2	Nil.	Nil.	3	2	4	7	2	2	2	2	1	27
1891 - -	Nil.	Nil.	Nil.	2	1	Nil.	3	2	Nil.	Nil.	Nil.	Nil.	8
1892 - -	Nil.	1	Nil.	Nil.	Nil.	Nil.	Nil.	Nil.	Nil.	9	5	2	17
1893 - -	5	—	—	—	—	—	—	—	—	—	—	—	

February 11, 1893.

(Signed) THOMAS PLATT,
Public Vaccinator, Oldham.

TABLE III.

Borough of Oldham.

NUMBER of PUBLIC VACCINATIONS performed by Dr. THOMSON during the following Years.

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Totals.
1888 - -	8	160 (mostly re-vaccinations).	26	23	5	12	13	1	2	9	6	8	222
1889 - -	2	3	1	2	12	2	Nil.	Nil.	8	5	1	1	37
1890 - -	6	Nil.	1	2	1	2	5	1	1	5	2	Nil.	26
1891 - -	1	6	Nil.	Nil.	Nil.	Nil.	1	Nil.	Nil.	1	Nil.	Nil.	9
1892 - -	Nil.	Nil.	Nil.	Nil.	Nil.	Nil.	Nil.	Nil.	Nil.	Nil.	1	1	2
893 - -	33 (5 primary).	Up to Feb. 22 111 (12 primary).	—	—	—	—	—	—	—	—	—	—	143

(Signed) GEORGE THOMSON,
Public Vaccinator, Oldham Old Town

OLDHAM.

§ 4. *Small-pox in Oldham*, 1892–3.

I am indebted to Dr. Niven for a large amount of information respecting the present outbreak of small-pox, together with maps and tables; and I have endeavoured to arrange these facts on the plan adopted in my other reports.

TABLE IV.

Small-pox: Monthly Incidence.

Monthly prevalence.

Month of Attack.	Total known.	Removed to Hospital.
January 1892	5 cases	2 cases.
February "	3 "	4 "
March "	4 "	4 "
April "	—	1 "
May "	—	1 "
June "	2 "	1 "
July "	—	—
August "	3 "	4 "
September "	7 "	3 "
October "	16 "	12 "
November "	15 "	14 "
December "	29 "	22
January 1893 (three weeks)	40 "	33
Total	124 "	101 "

Since every case (but one) known to the authorities at the time was admitted into hospital, the difference in the above returns is explained by the number of cases which were "overlooked" or "missed," *i.e.*, were not notified. It will be seen from the Table in Appendix that 27 cases fell under this category, and their detection and record serve to show the diligence with which the sources of infection have been traced out, and also the mild type of the disease in these cases.

Admissions to hospital.

The weekly incidence cannot be accurately stated, but the following shows the numbers admitted into hospital every week up to the present, not only from Oldham, but from Chadderton, and other districts, as Crompton, Middleton, and Royton.

TABLE V.

Westhulme Hospital, 1892–3: *Small-pox.*

	Oldham.	Chadderton.	Other Places.	Total.
Week ending—				
February 6, 1892	4	—	—	4
" 13, "	2	—	—	2
" 20, "	—	—	—	—
" 27, "	—	—	—	—
March 5, "	—	1	—	1
" 12, "	4	—	—	4
" 19, "	—	—	—	—
" 26, "	—	—	—	—
April 2, "	1	—	—	1
" 9, "	—	—	—	—
" 16, "	—	—	—	—
" 23, "	—	4	—	4
" 30, "	—	1	—	1
May 7, "	—	1	—	1
" 14, "	—	—	—	—
" 21, "	—	—	—	—
" 28, "	—	—	—	—
June 4, "	1	—	—	1
" 11, "	1	—	—	1
. . . . .	. .	. .	. .	. .
August 20, "	1	—	—	1
August 27, 1892	2	—	—	2
September 3, "	1	—	—	1
" 10, "	1	—	—	1
" 17, "	1	—	—	1
" 24, "	1	3	2(Cr.)	6
October 1, "	—	—	1(Cr.)	1
" 8, "	3	—	—	3
" 15, "	4	—	2(Cr.)	6
" 22, "	2	—	—	2
" 29, "	2	1	1 (R.)	4
November 5, "	5	—	—	5
" 12, "	2	3	—	5
" 19, "	2	2	—	4
" 26, "	5	4	—	9
December 3, "	4	3	—	7
" 10, "	8	7	1 (M.)	16
" 17, "	3	6	1 (R.)	10
" 24, "	7	11	—	18
" 31, "	1	9	—	10
January 7, 1893	6	2	1 (R.)	9
" 14, "	12	15	1 (R.)	28
" 21, "	15	10	—	25
Total	101	83	10	194
Cases not in hospital	23	6	—	—

In Diagram D. the weekly incidence of the cases is given so far as known.

Case mortality. Age and sex incidence.

Of these 124 cases, 17 died, or about 13·7 per cent.; 71 were males, and 53 females, the age distribution being as follows:—

TABLE VI.

Age and Sex Incidence.

	Males.		Females.		Recovered.	Died.
	Recovered.	Died.	Recovered.	Died.		
Under 1 year	1	—	—	—	1	—
1-5 years	4	1	3	2	7	3
5-10 "	6	2	2	—	8	2
10-15 "	6	—	8	—	14	—
15-20 "	9	—	5	1	14	1
20-30 "	19	1	10	1	29	2
30-40 "	6	2	7	—	13	2
40-50 "	5	3	2	1	7	4
50-60 "	1	—	2	1	3	1
60-70 "	—	—	1	1	1	1
70 and over	—	—	1	—	1	—
Age not stated	5	—	4	1	9	1
Total	62	9	45	8	107	17

History of outbreak.

From the data kindly supplied me by Dr. Niven in a detached table giving names and addresses of the patients, and their probable sources of infection, I am enabled to briefly sketch the history of the outbreak in Oldham since the beginning of 1892, which is also well illustrated by the map that has been carefully prepared by Dr. Niven (*not reproduced*).

The first case to be known to the authorities was that of D. B., a young man of 28 years, who was said to have been vaccinated but had no marks. In him the rash appeared on January 28, 1892, and he was admitted into hospital on the 31st. This case proved fatal, as did also that of his wife, E. B. (No. 7*), who

* The numerals refer to List of Cases, Appendix I.

remained with him at the hospital, whilst their child, W. B., (No. 4), was admitted into the hospital nine days after his parents. Subsequent inquiry revealed the fact that both father and child were in the habit of going to an inn, where a young man, J. B. (No. 2), was employed; this youth was found to be suffering from small-pox, and his attack was still further traced to an illness of his brother, who in his turn had been attending a football match at Batley, Yorks, where small-pox was then prevalent. Two other cases seemed referable to the same series, which arose from the mild character of the disease in the young man at the inn being such as to lead it to be "overlooked."

A month later both parents and two children of a family were removed to Westhulme Hospital. The children were unvaccinated, and there is no doubt they and their mother were infected by the father, who had been recently engaged at work at the hospital. There was in addition, in March, one case, in a waif, the origin of which could not be traced.

Thus, during the first quarter of 1892 there were only 12 cases arising in Oldham, in all but one of which the infection could be traced with a fair approach to certainty. No cases arose in April and May; but a child five years of age sent into the hospital by mistake on May 30, and vaccinated there, contracted small-pox before leaving; whilst early in the month there had been admitted a man, 21 years old, who apparently contracted the disease at Ardsley, near Wakefield.

There were no cases in July; but in the last week in August two persons (relations) were admitted, one of whom belonged to a family at Holebottom, Failsworth, where a number of cases had occurred which were not notified (notifications not being compulsory there). Dr. Niven thinks it highly probable that these Holebottom cases were the origin of several cases in Chadderton, as well as of those occurring at Hollinwood, Oldham. One other case (No. 17) occurred in August, that of a man whose source of infection could not be traced, and whose fellow worker (No. 20) was attacked subsequently. In addition to the last-named there were three other cases in September, one of whom (No. 19) had been in the scarlet fever ward till August 31, and another (No. 22) who developed small-pox whilst convalescent from scarlet fever in the hospital. The third case was a man, 48 years of age, who presented three good vaccination marks. He succumbed to the disease, which he may have contracted at Stalybridge.

Thirteen cases were admitted to hospital in October, one of whom (No. 26) was from a family where the mother and daughter had previously been attacked in succession, but whose cases were overlooked (Nos. 21 and 25). No. 25 seems also to have been the origin of at least six other cases (Nos. 32, 33, 35, 36, 37, 38), two of which were unrecognised (Nos. 35 and 38). Another case (No. 27) was brother to No. 19, who had been infected whilst in the hospital with scarlet fever. Four cases (Nos. 28 to 31) were related to an "untraced" and "overlooked" case, No. 23, and one of them, an unvaccinated child, six years of age (No. 28), died. A child of three years (No. 39) admitted on October 31 may possibly have contracted the disease from her brother, who was ill some time before, but no definite information is available; she has now been included in the list of "overlooked cases."

Fourteen cases were admitted in November, and 22 in December. One of these (No. 34), a girl of 13, came in with her sisters (Nos. 40 and 41), who were probably infected by her, for her attack, from which she was almost recovered, had been overlooked. The two previously "overlooked" cases, Nos. 35 and 38, gave the disease to relatives (Nos. 45 and 46), whilst an infant of No. 34's sister (No. 42), whose attack was overlooked at the time, may have infected a woman (No. 50) who was a neighbour, and who in her turn infected her husband (No. 59) and son (No. 58). Some suggestive confirmatory evidence that the illness which No. 39's brother had was small-pox arose in the discovery that two lads (Nos. 43 and 44) attending the same school had the disease about the same time, and in each case infecting another member of the family (Nos. 49 and 47). The attack of No. 51, a man 40 years of age, was thought to be connected with that of No. 25. There were two fatal cases in this month, one of an imbecile from the workhouse (No. 52), and one, a man 42 years, "untraced." There was one other workhouse imbecile attacked this month, and three others in December. One man admitted in November contracted the disease in Warrington, and two members of his family (Nos. 56, 57) were infected by him. In several cases (at least eight) the origin could not be traced, whilst three or four were probably connected with a series of cases occurring in these months in Smith Street, Chadderton, related to the Holebottom outbreak.

In January the number of "untraced" cases amounted to 12, whilst also several cases were brought to light by the subsequent occurrence of cases in the same or related households. A striking instance of these overlooked cases was that of a family nearly all of whose members had suffered in turn from small-pox before its occurrence was suspected in the illness which proved fatal, of an unvaccinated infant one year old. This case was notified on the 20th January, and it then appeared that since the middle of December one member of the family after another had had symptoms, slight and transient, mostly with a scanty eruption. In all 11 members of the family had the disease. (*See* Tables O. 18 to O. 27). Another family group in which cases were overlooked is that furnished by the D.'s, of whom the father (No. 79) was attacked about December 20, two children (Nos. 91 and 92) about January 3, and finally the mother (No. 114), who was removed to hospital together with her children on January 18th, their cases not having been previously recognised.

It will have been observed that in a fair proportion of the cases (about 25 in 1892 and 12 in 1893) inquiry failed to assign any definite source of infection. It is possible that the infection of some of these untraced cases may be referred to their proximity to the hospital, but even so they would form only a small minority of the whole number. It is also instructive to note how large a number (about 40 in 1892 and 20 in 1893) were more or less directly connected with cases the existence of which had been overlooked. Much credit is due to the Sanitary Authority for the manner in which these sources of infection have been revealed, illustrating as it does in a striking manner the vast share taken in the dissemination of small-pox by the milder types of the disease which pass unrecognised.

Although I am not in a position to give any analysis of the types of small-pox presented by the Oldham cases, the following tables show the condition of the subjects attacked in respect to vaccination. It will be seen that of the whole number 124, 79 were vaccinated, and 8 of these cases proved fatal. These deaths between the ages of 20 and 60, the youngest being 28, the oldest 51. The record gives the vaccination marks as follows:—

Vaccination data of cases of small-pox

Having one good mark - - -	1 case.
Having two marks - - - -	5 cases.
Having three good marks - - -	1 case.
Having four fair marks - - -	1 case.

In eight cases—all recoveries—there is no information given upon vaccination. In two cases, vaccination was stated to have been performed, but there were no marks visible; one of them was fatal, a man aged 28. Three cases—children under 10—were undergoing primary vaccination when attacked. There were 32 recorded as unvaccinated, 22 of these being under 15 years of age; eight cases were fatal, five under 10, one between 15 and 20 years, one 65 years (a query is placed against the statement "unvaccinated" in this case), and in one there is no record of the age.

I have reproduced the same table—with the omission of the "overlooked" cases—of which the record is more imperfect than in those actually observed in hospital.

OLDHAM.

TABLE VII.

Oldham: Small-pox. All Cases.

Condition as to Vaccination.

	Vaccinated.		No Information as to Vaccination.		Alleged Vaccination; no Marks.		"Under" Vaccination.		Unvaccinated.		Total.	
	Recovered.	Died.	Recovered.	Died.	Recovered.	Died.	Recovered.	Died.	Recovered.	Died.	Recovered.	Died.
Under 1 year	—	—	—	—	—	—	—	—	1	—	1	—
1-5 years	—	—	—	—	—	—	2	—	5	3	7	3
5-10 „	3	—	—	—	—	—	1	—	4	2	8	2
10-15 „	7	—	—	—	—	—	—	—	7	—	14	—
15-20 „	12	—	1	—	—	—	—	—	1	1	14	1
20-30 „	26	1	1	—	—	1	—	—	2	—	29	2
30-40 „	12	2	—	—	—	—	—	—	1	—	13	2
40-50 „	6	4	—	—	1	—	—	—	—	—	7	4
50-60 „	2	1	—	—	—	—	—	—	1	—	3	1
60-70 „	1	—	—	—	—	—	—	—	—	1	1	1
70 and over	—	—	—	—	—	—	—	—	1	—	1	—
Age?	2	—	6	—	—	—	—	—	1	1	9	1
Total	71	8	8	—	1	1	3	—	24	8	107	17

TABLE VIIA.

Exclusive of "Overlooked" Cases.

	Vaccinated.		No Information as to Vaccination.		Alleged Vaccination; No marks.		"Under" Vaccination.		Unvaccinated.		Total.	
	Recovered.	Died.	Recovered.	Died.	Recovered.	Died.	Recovered.	Died.	Recovered.	Died.	Recovered.	Died.
Under 1 year	—	—	—	—	—	—	—	—	1	—	1	—
1-5 years	—	—	—	—	—	—	2	—	5	3	7	3
5-10 „	1	—	—	—	—	—	1	—	4	2	6	2
10-15 „	3	—	—	—	—	—	—	—	7	—	10	—
15-20 „	9	—	—	—	—	—	—	—	1	1	10	1
20-30 „	22	1	—	—	—	1	—	—	2	—	24	2
30-40 „	12	2	—	—	—	—	—	—	1	—	13	2
40-50 „	6	4	—	—	1	—	—	—	—	—	7	4
50-60 „	—	1	—	—	—	—	—	—	1	—	1	1
60-70 „	1	—	—	—	—	—	—	—	—	1	1	1
70 and over	—	—	—	—	—	—	—	—	1	—	1	—
Age?	—	—	—	—	—	—	—	—	—	1	—	1
Total	54	8	—	—	1	1	3	—	23	8	81	17

Re-vaccination of members of infected households.

The medical officer, when visiting a small-pox case prior to its removal, urges the other inmates to be re-vaccinated, as well as those who are known to have been recently visiting the house. Dr. Niven furnished me with a table showing to what extent the appearance of a case of small-pox was followed by the vaccination of other members of the family and of the neighbours. This table is reproduced in Appendix II., and the references to the map and the Table of Cases (Appendix I.) will supply such other details in their history as may render them more readily understood. The table shows at what period after the discovery of the case these vaccinations were performed, and what was the subsequent incidence of the small-pox on the families and neighbours. Dr. Niven points out that only "two "neighbours take the disease (in connexion with cases No. 48 and No. 102)." The previous cases (48, 56, 57), the first of these were uncles to this patient (A. A. D. No. 62), whose sister (No. 64) had been vaccinated at the same time, December 1st, the day of removal of Nos. 56 and 57. The second child (E. D., No. 64), four years of age, "took well," and only presented a rubeolar rash, which appeared on the sixth day of vaccination. Dr. Niven does not think this was a case of small-pox. The other case referred to arose at a date subsequent to this inquiry. It was the case of an unvaccinated child who visited the house in question whence the patient had been removed on January 13, "after the house was "stoved, and a strict disinfection carried out, there "being then no known case in the house." The child developed a small-pox eruption 14 days after, but Dr. Niven is "disinclined to believe in the connexion sug-"gested, and supposes that the exposure was not in "that house, or else was of a different kind to that "suggested." Lastly, he adds, in connexion with this table:—

"I have visited every case, with one or two exceptions "owing to necessary absences, before removal; and the "families are warned *at once* to seek protection from "vaccination and re-vaccination. They have done so "oftener than I had imagined. In some instances, "however, they have not *at once* got vaccinated, but "have waited till it was too late to prevent the results "of the infection present at my visit, *e.g.*, case of J. T.

" (No. 57 in map), and of E. C. (No. 80 in map). The " information presented in this table was obtained by " the inspectors who visited each household on the list " of Oldham households given them by me. The " table is completed by the addition of a statement " of the number remaining in the family who required " vaccination."

The continued reception of cases of scarlet fever into Westhulme Hospital during last year when the original small-pox wards were receiving cases led to the occurrence of small-pox in some of the fever patients, and in consequence of that systematic vaccinations and re-vaccinations of the fever cases were performed. It may be repeated here that the scarlet fever block is completely detached from that devoted to small-pox, and as far as possible all communication between the two is cut off. The Medical Superintendent himself visited the scarlet fever before going to the small-pox wards. The matrons remained on the small-pox side, and the fever and small-pox nurses were distinct. The laundry, however, is common to both. In 1888 a fatal case of small-pox occurred in a scarlet fever ward. In 1892, a vaccinated child, M. N., 14 years old (No. 19 in Table), who was discharged from the scarlet fever ward on August 31, " developed the eruption of a mild attack " of small-pox exactly 14 days after discharge from the " hospital." On September 24 another child, five years of age, and not vaccinated, developed small-pox in the hospital during convalescence from scarlet fever, for which he had been admitted on August 19 (No. 22 in Table). These cases determined Dr. Niven to lose no time in vaccinating the majority of inmates of the fever wards, the consent of the children's parents to this step having first been obtained. Thereafter in every case of fever, the child—whether previously vaccinated or not—was vaccinated on admission to hospital. Table in Appendix III., drawn up by Dr. Niven, gives particulars of these vaccinations and their results, which may be summarised as under:—

Cases of Scarlet Fever—Vaccinated.

	Primary Vaccinations.		Re-vaccinations.	
	Successful.	Unsuccessful.	Successful.	Unsuccessful.
1-5 years	14	2*	-	1
5-10 „	13	—	6	3
10-15 „	3	—	11	3
15-20 „	1	—	6	1
20-30 „	—	—	2	—
	31	2	25	8

* One of these, an infant of 20 months, died from the fever on the third day of vaccination.

In the above summary I have included amongst the primary vaccinations all those in which no marks were visible when the case was admitted. The list is instructive mainly as showing that out of 10 children under the age of 10 years re-vaccination was successfully performed in six cases, although in some the number of vesicles fell short of the number of insertions. The most noticeable, perhaps, are the cases of A. H. (No. 50), æt. six years, who had four primary marks, and in whom one out of three fresh insertions took, and that of T. D., æt. seven (No. 66), whose re-vaccination took in two places. OLDHAM.

Dr. Niven adds that two of the T. children of some family as Nos. 41 and 42, and aged respectively eight and six years of age, were re-vaccinated by him, the older child taking in three places and the younger in one. Also that in the family of the man C. (No. 105 in Table I., Appendix) who died of small-pox, one child, R. C., æt. 10, with four primary marks, yielded three marks on re-vaccination; and another, E. C., æt. seven, with three primary marks, yielded two marks on re-vaccination.

Reverting to the vaccination table of scarlet fever cases, Dr. Niven points out that six unsuccessful vaccinations are recorded on November 19, and suggests that these failures were due to a " feeble tube of lymph." One of these cases, C. W. T., No. 45 (No. 80 in Table of Cases, Appendix I.), subsequently developed small-pox, which was overlooked (or concealed), and gave it to his two unvaccinated sisters (Nos. 98 and 99 in same table), one of whom died of variola hæmorrhagia.

Conclusions.

1. The sanitary department is well organised, and the action taken by the authorities prompt and satisfactory.

2. The fact that every case but one was isolated in hospital shows that the people generally concur in the efforts made by the authorities to deal with epidemics.

3. The lack of any separate hospital accommodation for small-pox cases has necessitated the closing of Westhulme Hospital to fever.

4. The proximity of Westhulme Hospital to inhabited dwellings renders it unsuitable for the treatment of small-pox.

5. Although in every instance re-vaccination was offered to members of infected households and others connected with the case of small-pox, very little advantage was taken of the offer.

I desire to thank Dr. Niven for his courteous assistance, and much valuable information.

London, April 24, 1893. S. C.

B. REPORT ON THE PREVALENCE OF SMALL-POX AT CHADDERTON, 1892-93.

Contents.

§ 1.—*Chadderton: Area; Population:—*
Previous Small-pox.
Westhulme Hospital: alleged Source of Infection.

§ 2.—*Sanitary Measures in Time of Small-pox.*
Removal to Hospital.
Disinfection.
Re-vaccination.

§ 3.—*Small-pox in Chadderton, 1892-93:—*
Monthly Incidence.
Cases attributed to Hospital Infection.
Smith Street Outbreak.
Analysis as to Age, Sex, Vaccination.
Re-vaccination of Households.

Conclusion.

§ 1. *Chadderton: Area, Population, previous Small-pox.*

Situation. Chadderton* is an Urban Sanitary District governed by a Local Board. It is situated to the west of Oldham with which it is conterminous; to the north it is adjacent to the district of Royton; to the west to the borough of Middleton, and on the south it borders on the lately extended boundary of the city of Manchester, and with the Local Board district of Failsworth. Its area is 3,082 statute acres, but it is only populated in its eastern half, where it is bounded by Oldham. The western part of the district is given up to grazing farms. The eastern or populated side is on clay overlying coal measures; the western is on sand, also near coal strata.

Population. The population at the last Census (1891) was 22,087, giving a density of rather more than seven persons per acre for the whole district; but, of course, the actual density of the inhabited portions is many times more than this.

Industries. The inhabitants, exclusive of about 400 persons engaged in farming, are wholly occupied in the staple trade of cotton spinning, or in the making of cotton spinning machinery. They occupy wholesome modern cottages of which the drains are in all cases disconnected from the sewers. There are no cesspools in the district, the pail or tub system being everywhere in operation.

The Lancashire and Yorkshire Railway between Oldham and Manchester (viâ Middleton Junction) divides the district into two halves, fairly equal in area and population, which are generally known as North and South Chadderton.

Previous small-pox. From 1872 to 1880 there were only two years in which cases of small-pox occurred in Chadderton, viz., in 1876, when there were two cases, one in North Chadderton and one in South Chadderton; and in 1877, when there were 11 cases distributed about the district, only one being in North Chadderton.

The returns of small-pox in subsequent years are given in the following table:—

Table VIII.

Table showing Births registered, Public Vaccinations, and Cases of Small-pox reported from 1881 *to* 1891 *inclusive.*

Year.	Population.	Births registered.	No. of Public Vaccinations.	Cases of Small-pox.
1881	16,897	603	286	2
1882	—	645	246	2
1883	—	685	397	1
1884	—	690	251	0
1885	—	747	391	0
1886	—	727	325	0
1887	—	760	161	0
1888	—	727	361	60
1889	—	696	56	0
1890	—	693	30	1
1891	22,087	732	15	0

Alleged infection by Westhulme Hospital. Dr. Patterson points out that the Westhulme Hospital erected in 1878 by the borough of Oldham to receive scarlet fever, small-pox, and other infectious diseases is situated close to the N.E. corner of the Chadderton district, indeed just over the boundary line; and that the small-pox wards are within 100 yards of occupied houses in Chadderton. He notes further that prior to the erection of the hospital small-pox was very seldom met with in Chadderton, and that from the time of the formation of the Local Board, in 1872, to the opening of the hospital, no case of small-pox occurred in the Burnley Lane district of North Chadderton in which the hospital is situated. He has, however, observed that since the hospital was opened, and had received cases of small-pox, the admission of such cases has "always been followed by an outbreak in the contiguous part of Chadderton," and he is further convinced that the disease is more likely to spread in Chadderton under these circumstances during the prevalence of north-east winds. It will be seen later to what extent he attributes the present outbreak to this source of infection, and as regards past years he tells me that the two cases in 1881 ensued after cases had been taken into the hospital, and that in the following year the two cases, one in North and one in South Chadderton, were within what he terms the "hospital area." In 1888 Oldham and Chadderton had an outbreak of small-pox, and of the 60 cases from the latter place, Dr. Patterson attributes 40 to infection, direct or indirect, from the hospital. This opinion he supports by reference to the maps which he furnished me, showing the incidence of cases in Chadderton in the vicinity of the hospital, and within a distance of 1,500 yards of it. It is fair to add that the alleged infection from the Westhulme Hospital in 1888 was carefully inquired into at the time by Dr. Niven, the results of whose inquiry was afterwards published,† who contends that many of the "untraced" cases are probably those of tramps; and that the evidence of hospital infection was insufficient. He truly says that a hospital should not be charged with spreading infection, unless the cases occurring in its neighbourhood are not reasonably susceptible of any other explanation; and failing this, there should be an observed recurrence of disease near the hospital when cases are taken in. To my mind, in the present case, the strongest argument rests in the comparative numbers of untraced cases in Oldham and Chadderton respectively.

§ 2. *Sanitary Measures in Time of Small-pox.*

The measures taken by the Chadderton Sanitary Authority in dealing with small-pox are as follows:—

Notification. On receipt of the notification the Medical Officer of Health visits the house, and telephones to Oldham for the ambulance.

Removal to hospital. The case is then removed to Westhulme Hospital, the Chadderton Board paying the Oldham Corporation the sum of 2*l.* 2*s.* per week for every patient so removed.

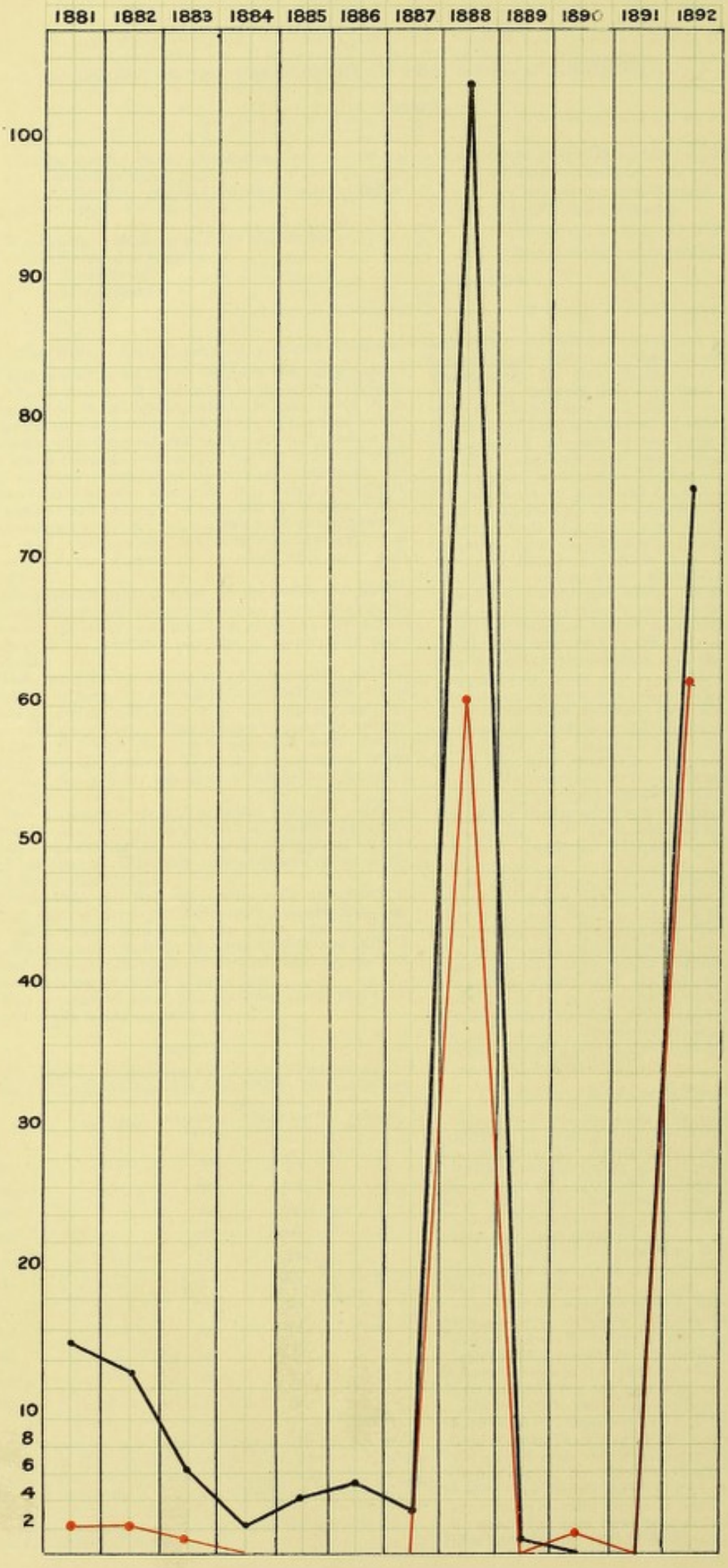
The children of the house are kept from school, and all mill-hands are from work, until the disinfection of the house is completed.

Disinfection. The rooms are fumigated with sulphur, and a supply of soap is granted by the sanitary authority to the householder with instructions to undertake thorough cleansing of the house and bathing of the inmates. The infected bedding and clothing are removed to Oldham to the disinfection station there.

The sanitary inspector certifies when the cleansing operations are completed, and then the children and workers are set free to attend school and return to work. The inspector continues to make daily visits for 10 or 12 days from the date of appearance of the rash in the case that has been removed.

* For the facts contained in this report I am indebted to Dr. Patterson, Medical Officer of Health.

† On cases of small-pox occurring in 1888 near Westhulme Hospital, Oldham.—*Medical Chronicle*, April 1889.



NUMBER OF CASES OF SMALL POX KNOWN TO AUTHORITIES IN YEARS 1881 TO 1892.

The Medical Officer of Health offers re-vaccination to the inmates of infected houses, or refers them to their medical attendants to be vaccinated. The extent to which this has been taken advantage of is seen in Table in Appendix V.

§ 3. *Small-pox in Chadderton*, 1892–93.

The total number of cases of small-pox known to the authorities during the past and present year up to the date of my visit was 89, and of this number all but six were admitted into Westhulme Hospital (*see* Oldham Report, *ante*, Table). The monthly incidence has been as follows:—

TABLE IX.

Chadderton, 1892–93: *Small-pox.*

Attacks in	Monthly Incidence.
January 1892	0
February ,,	1
March ,,	1
April ,,	4
May ,,	1
June ,,	0
July ,,	0
August ,,	0
September ,,	3
October ,,	2
November ,,	13
December ,,	36
January 1893 (3 weeks)	28
	89

The bulk of the cases have occurred in the past three months, a somewhat greater proportion than arose at the same time in Oldham, Pl. XXII., as the following comparison shows:—

	Oldham.	Chadderton.
January to November 1892	40 cases	12
November 1892 to January 1893	84 ,,	77

As regards the origin of the cases it will be seen from the table in the Appendix that no fewer than 63 are assigned by Dr. Patterson to infection from the Westhulme Hospital, including every case, the two exceptions that occurred in Chadderton from the middle of December onwards, a period when, as he remarks, there was a marked predominance of N.E. wind. He assures me that in each of the primary cases of this series inquiry failed to assign any other mode of infection. I need hardly say that to have checked these statements would have taken me beyond the scope of the present inquiry, and, moreover, an inquiry made after, in many instances, a considerable lapse of time would have had but little force. It may, however, be permitted me to express the opinion that the proximity of the hospital to certain parts of Chadderton, which were especially attacked with the disease, affords *primâ facie* support to Dr. Patterson's contention, although, knowing how, in large a proportion of cases, the origin may not be satisfactorily traced, it is permissible to doubt whether all the cases which he assigns to this source really acquired the disease by aerial infection. Chadderton, moreover—if this contention be right—must bear the blame as well as Oldham, for it provides no alternative hospital provision for its cases, and thus would itself be helping to maintain the forces of its own infection.

The first case to arise in Chadderton was that of an unvaccinated child in Brierly Street, within 200 yards distant from the hospital, who contracted the disease about the middle of February, when there were about six cases of small-pox in the wards. No other source of infection was traced by Dr. Patterson. There next ensued a series of cases traceable to a hawker of coals, J. E. G. (No. 2), whose case was not notified, and who continued his avocation during the time of the eruption. Mrs. H——, aged 25, who presented "four good marks" of vaccination, died, and her unvaccinated child, two years old, attacked a few days before her mother, recovered. Then two children (Nos. 5 and 6), neighbours of the foregoing, who visited and played with these children, were attacked about 8 or 10 days later, and a man D. C., æt. 47, who may have been in contact with J. E. G. when the latter called at the mill where he was employed. From this date—early in May—to the middle of September, Chadderton was free from small-pox, when three cases occurred which were attributed to infection from the hospital. During October there commenced an outbreak involving certain families in Smith Street, which had its origin apparently at Failsworth, the same source in fact of other cases that occurred in Oldham about the same time. Some clothing from an infected house at Failsworth was brought to No. 23, Smith Street, and about the middle of October Ellen L——, 14 years of age, living in this house, was attacked. This case was not reported, and indeed the small-pox was not discovered in this household until the death on November 9th of Robert L——, aged 16, from what was supposed to have been "malignant scarlet fever"; on November 17th Thomas L——, æt. 12; and on November 21st, Martin L——, æt. 9, manifested small-pox and were removed to hospital. About the same time the disease appeared in members of families who had been at the house on the occasion of the funeral of Robert L——, but the period between this possible exposure and the appearance of rash in the case of the first of these, Mrs. A——, of 27, Smith Street (daughter to the L.'s), was only seven days. She may, therefore, have been infected by the earlier case at No. 23. Her husband and child (Nos. 22 and 23) developed small-pox 10 days later, the former had refused re-vaccination on November 17, the latter had been vaccinated on that day, and was, therefore, "under vaccination" at the time of his attack, which proved to be a very mild one. On December 10, Isaac R—— (No. 31) and Sarah R—— (No. 32), together with three of their children (Nos. 29, 30, and 33), were removed to hospital from 29, Smith Street, and on the 15th George R——, æt. 9, belonging to the same family, was sent to hospital from the workhouse. The mother (aged 36) and her infant (aged two months) died. This family was no doubt infected through David R——, aged 9 (No. 21), who had a mild unrecognised attack on November 23rd; he was a playmate of Joseph A—— (No. 23), of 27, Smith Street, and also of the children of S. McN—— (No. 27), who lived at 15, Smith Street, and who had lent clothing to Mrs. L—— for the funeral of the latter's son. Mrs. McN—— developed small-pox 14 days after this clothing was returned to her. Her husband was re-vaccinated, and their unvaccinated child was vaccinated by Dr. Patterson; they did not contract the disease. David R—— probably also gave the disease to a neighbour, L. S——, æt. two years, unvaccinated (No. 35); and another case traceable to the same source was that of Joseph L——, of 25, Acre Street, a man 52 years of age. The whole group amounted to 16 cases, and the medium of infection was probably articles of clothing from an infected house. It is, however, possible that the first to be attacked had visited the infected house at Failsworth. There remain only three cases outside the numbers who are believed to have been infected from the hospital miasm, one of these (No. 12) had been visiting her father's house in Yorkshire, where there was a case of small-pox; and the other two (Nos. 37 and 63) were untraced.

Of the cases occurring in houses situated within the "area of hospital infection" (Dr. Patterson), 42 were single cases in the house; in five houses there were two cases; in one, three cases, and in two, four cases; yielding 63 cases in 50 houses (*see* Appendix V.).

Of the total number of 89 cases of small-pox, 44 were males and 45 females, and the deaths were 9, or about 10 per cent. The age incidence was as follows:—

TABLE X.

	Recovered.	Died.	Total.
Under 1 year of age	2	1	3
1–5 years	8	2	10
5–10 ,,	6	2	8
10–15 ,,	8	—	8
15–20 ,,	11	1	12
20–30 ,,	28	1	29
30–40 ,,	10	1	11
40–50 ,,	5	1	6
50–60 ,,	1	—	1
60 and over	1	—	1
	80	9	89

CHADDERTON.

Smith Street outbreak.

Cases in "hospital area."

Age and sex incidence and mortality.

CHADDERTON.

It will be seen from the subjoined table that six of the fatal cases were in unvaccinated subjects out of a total of 18 such persons; that two deaths occurred among the 68 "vaccinated," and that in one fatal case there was no information regarding vaccination.

I am unable to give any more detailed analysis as respects the type of attack, &c., but in the Table of Cases (Appendix) will be found stated the number and character of vaccination marks present in the vaccinated subjects.

Vaccination relation of small-pox cases

Chadderton: Small-pox Cases. Condition as to Vaccination.

		Vaccinated.			"Under" Vaccination.			Unvaccinated.			No Information on Vaccination.			All Classes.		
		Recovered.	Died.	Total.	Recovered.	Died.	Total.	Recovered.	Died.	Total.	Recovered.	Died.	Total.	Recovered.	Died.	Total.
Under 1 year	M.	—	—	—	1	—	1	1	—	1	—	—	—	2	—	2
	F.	—	—	—	—	—	—	—	1	1	—	—	—	—	1	1
1-5	M.	1	—	1	1	—	1	1	—	1	—	—	—	3	—	3
	F.	—	—	—	—	—	—	5	2	7	—	—	—	5	2	7
5-10	M.	3	—	3	—	—	—	1	2	3	—	—	—	4	2	6
	F.	2	—	2	—	—	—	—	—	—	—	—	—	2	—	2
10-15	M.	2	—	2	—	—	—	—	—	—	—	—	—	2	—	2
	F.	5	—	5	—	—	—	—	—	—	1	—	1	6	—	6
15-20	M.	3	—	3	—	—	—	—	—	—	—	1	1	3	1	4
	F.	6	—	6	1	—	1	1	—	1	—	—	—	8	—	8
20-30	M.	15	—	15	—	—	—	1	—	1	—	—	—	16	—	16
	F.	11	1	16	—	—	—	1	—	1	—	—	—	12	1	13
30-40	M.	6	—	6	—	—	—	—	—	—	—	—	—	6	—	6
	F.	4	1	5	—	—	—	—	—	—	—	—	—	4	1	5
40-50	M.	3	—	3	—	—	—	—	1	1	—	—	—	3	1	4
	F.	2	—	2	—	—	—	—	—	—	—	—	—	2	—	2
50-60	M.	1	—	1	—	—	—	—	—	—	—	—	—	1	—	1
	F.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
60 and over	M.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	F.	—	—	—	—	—	—	1	—	1	—	—	—	1	—	1
All ages	M.	34	—	34	2	—	2	4	3	7	—	1	1	40	4	44
	F.	30	2	32	1	—	1	8	3	11	1	—	1	40	5	45

Re-vaccination of households.

Dr. Patterson kindly furnished me with particulars regarding the number of inmates of infected houses in addition to the first case noted, and the supervention of subsequent cases in the house, together with the numbers of those who were re-vaccinated (or primarily vaccinated) when the case was removed. These figure are appended to the Table of Cases (Appendix V.). They refer to 28 households, giving a total number of inmates (additional to the small-pox case), 107; of whom 74 were re-vaccinated, 4 had previously had small-pox, and in four households additional cases of small-pox occurred in subjects who had not been re-vaccinated or whose vaccination did not "take."

CONCLUSIONS.

1. The sanitary organisation of the district is hardly adequate for the needs of its population, and in times of epidemic its resources must be severely taxed.

2. I must, however, testify to the zeal and energy with which the Medical Officer of Health discharges his duties; and in the present outbreak the measures taken have been prompt and thorough.

3. There can be little doubt that the contiguity of Westhulme Hospital has been responsible for some of the cases of small-pox in Chadderton.

My thanks are due to Dr. Patterson for the valuable information and assistance rendered me in this inquiry.

S. C.

London, April 24, 1893.

LIST OF APPENDICES.

I. *Table of Cases of Small-pox in Oldham*, 1892–93.

II. *Table giving Details of Re-vaccination of Infected Households in Oldham* (*Dr. Niven*).

III. *Cases of Scarlet Fever vaccinated at Westhulme Hospital during Prevalence of Small-pox* (*Dr. Niven*).

IV. *Table of Cases of Small-pox at Chadderton*, 1892–93, *with Re-vaccination of Infected Households.*

V. *List of Houses infected by Small-pox within the "Hospital Area"* (*Dr. Patterson*).

VI. *Oldham Union :—Vaccination Returns*, 1872–1892.

APPENDIX I.

OLDHAM.

SMALL-POX, 1892–93.

Table of Cases.

—	Reference to Map, and overlooked Cases (O).	—	—	—	Date of Rash.	Date of Removal to Hospital.	Result.	Vaccination.	Remarks.
1	(4) O. 1	T. B.	M.	—	Jan. 1, 1892 (about)	—	Recovered	No information	Contracted small-pox probably at Batley at a football match.
2	O. 2	T. B.	M.	19	„ 14 (about)	—	„	2 large marks	Brother to No. 1, engaged at Robin Hood Inn.
3	1	C. B.	M.	28	„ 28	Jan. 31	Died	Alleged; but no marks.	Infected at Robin Hood Inn by No. 1 or 2.
4	1	W. B.	M.	2	„ 30	Feb. 8	Recovered	Unvaccinated	Infected at Robin Hood Inn, son of No. 3.
5	3	H. C.	M.	44	„ 30	„ 1	„	Alleged; no marks	Probably infected by No. 1.
6	7	W. W.	M.	29	Feb. 6	„ 12	„	2 marks	Untraced, probably connected with foregoing cases.
7	1	E. B.	F.	28	„ 11	Jan. 31	Died	2 „	Wife of No. 3.
8	O. 3	— B.	M.	—	„ 24 (about)	March 8	Recovered	3 „	Contracted whilst working at Westhulme Hospital; case not reported.
9	8	A. B.	F.	8	March 6	„ 8	„	Unvaccinated	Daughter of No. 8.
10	8	M. B.	F.	26	„ 7	„ 8	„	2 marks	Wife „ „
11	8	B. B.	M.	3	„ 8	„ 9	„	Unvaccinated	Son „ „
12	12	J. B.	M.	26	„ 30	April 1	„	2 fair marks	Not traced.
13	14	A. P.	M.	21	June 2	June 5	„	4 marks	Contracted at Ardsley, near Wakefield.
14	13	S. M.	M.	5	„ 25	May 30	„	3 recent marks "Under" vaccination.	Admitted to hospital in error; vaccinated twice, May 31 (failed) and June 6 (successful).
15	17	M. A. R.	F.	29	August 20 (about)	August 25	„	2 marks	Member of a family at Holebottom, Failsworth, where a number of cases occurred and were not notified, notification not being compulsory there. She therefore contracted it from an overlooked case (O. 4).
16	16	E. H.	F.	10	„ 23	„ 24	„	Unvaccinated	Related to foregoing.
17	18	J. T.	M.	38	„ 28	„ 31	„	2 marks	Not traced: had been visiting several public houses on Aug. 14.
18	19	J. S.	M.	48	Sept. 5 (about)	Sept. 7	Died	3 good marks	Sent from workhouse. Probably infected at Stalybridge.
19	20	M. N.	F.	14	„ 13	„ 15	Recovered	3 fair „	Had been inmate of scarlet fever ward: discharged Aug 31.
20	21	A. S.	M.	21	„ 20	„ 19	„	Unvaccinated	A fellow worker with No. 17, but not clearly traced.
21	O. 6	— N.	F.	—	„ 21 (about)	—	„	Vaccinated	Mother of Nos. 25 and 26, an overlooked case.
22	15	F. C.	M.	5	„ 24	August 19	„	Unvaccinated	Developed small-pox whilst convalescent from scarlet fever in Westhulme Hospital.
23	O. 7	H. B.	M.	12	„ 26	Oct. 11	„	2 marks	Untraced. No. 32 in map.
24	26	F. L.	M.	12	„ 27	„ 8	„	2 good marks	Lives close to No. 23.
25	O. 5	— N.	F.	—	Oct. 4 (about)	—	„	Unvaccinated	Daughter of No. 21, an overlooked case.
26	22	A. N.	M.	14	„ 4	Oct. 5	„	2 good marks	Brother to No. 25.
27	20	A. N.	M.	8	„ 6	„ 7	„	3 marks	Brother to No. 19, but probably infected through an unrecognised intermediate case. His attack was very mild; no papules, but characteristic macula.

OLDHAM AND CHADDERTON.

—	Reference to Map, and overlooked Cases (O).	—	—	—	Date of Rash.	Date of Removal to Hospital.	Result.	Vaccination.	Remarks.
28	28	F. B.	M.	6	Oct. 9, 1892	Oct 10	Died	Unvaccinated	Brother to No. 23 (overlooked).
29	28	W. B.	M.	15	„ 9	„ 10	Recovered	2 marks	„ „ „
30	30	J. S. W.	M.	17	„ 10	„ 10	„	Unvaccinated	Infected by No. 23.
31	31	B. B.	F.	1	„ 10?	—	Died	„	Sister to No. 23.
32	33	W. S.	M.	25	„ 17	Oct. 18	Recovered	1 good mark	May have been connected with No. 25.
33	34	G. G.	M.	23	„ 18	„ 20	„	3 marks	„ „ „
34	O. 8	E. W.	F.	13	„ 19	Nov. 2	„	3 „	„ „ „
35	O. 10	— B.	M.	—	„ 19 (about)	—	„	No information	Infected by No. 25 (O. 5); was thought to be suffering from influenza.
36	35	T. B.	M.	38	„ 21?	Oct. 23	„	2 good marks	Possibly infected by No. 25.
37	36	W. C.	M.	21	„ 22	„ 24	„	1 mark	„ „ „
38	O. 11	— D.	F.	—	„ 27 (about)	—	„	No information	Daughter of No. 46, in service at house of No. 25.
39	37	G. C.	F.	3	„ 29	Oct. 31	„	Unvaccinated	Her brother (attending school) was ill some time before.
40	38	F. W.	F.	16	„ 30	Nov. 2	„	3 marks	Sister to No. 84.
41	38	A. W.	F.	18	Nov. 1	„ 2	„	2 „	„ „
42	O. 9	—	M. infant	—	„ 2 (about)	—	„	Unvaccinated	Child of sister of No. 34.
43	O. 12	F. H.	M.	10	„ 3 (about)	Nov. 20	„	2 marks	Attends same school as brother of No. 39. Case not discovered for more than a fortnight.
44	42	F. J.	M.	11	„ 3	„ 4	„	Unvaccinated	Attends same school as brother of No. 39. Case not discovered for more than a fortnight.
45	44	S. T. B.	F.	33	„ 3	„ 10	„	„	Wife of No. 35.
46	46	R. D.	M.	39	„ 10	„ 11	„	1 mark	Father of No. 38.
47	42	W. J.	M.	13	„ 14	„ 18	„	Unvaccinated	Brother to No. 44.
48	49	J. C.	M.	39	„ 14	„ 19	„	1 mark	Contracted at Warrington.
49	50	M. A. H.	F.	10	„ 17	—	„	Unvaccinated	Sister of No. 43.
50	53	H. B.	F.	32	„ 19	Nov. 21	„	2 marks	Infected by No. 42, neighbour's child.
51	52	J. T. M.	M.	40	„ 21	„ 21	„	2 „	Probably connected with No. 25.
52	—	S. I.	F.	40	„ 21?	„ 23	Died	2 „	An imbecile, at workhouse.
53	—	E. W.	F.	26	„ 22?	„ 24	Recovered	1 mark	„ „
54	54	J. Y.	M.	42	„ 29	„ 30	Died	2 small marks	Not traced.
55	57	J. T.	M.	39	„ 29	Dec. 3	Recovered	2 good „	May be connected with cases in Smith Street, Chadderton, and Holebottom, Failsworth.
56	49	E. C.	M.	27	Dec. 1	„ 1	„	2 good „	Same family as No. 48.
57	49	A. C.	M.	24	„ 1	„ 1	„	Unvaccinated	„ „ „
58	53	P. B.	M.	4	„ 2	„ 5	„	„	Son of No. 50.
59	53	J. S. B.	M.	29	„ 5	„ 7	„	1 good mark	Husband of No. 50.
60	—	E. S.	F.	22	„ 6	„ 7	„	2 marks	Imbecile, at workhouse.
61	61	T. G.	M.	30	„ 6	„ 7	„	2 „	A fortnight before in contact with suspected (but untraced) case.
62	49	A. A. D.	F.	11	„ 6	„ 7	„	Unvaccinated	Relation of Nos. 48, 56, 57.
63	—	M. M.	F.	80	„ 6?	—	„	„ (?)	Imbecile, workhouse.
64	49	E. D.	F.	4	„ 6	Dec. 10	„	4 recent marks "Under" vaccination.	Sister of No. 62; a doubtful case. Vaccination took well, Dec. 1; no papules; rubeolar rash.
65	655	J. W.	M.	23	„ 7	„ 10	„	5 good marks	Not traced.
66	—	C. E.	F.	65	„ 8?	„ 10	Died	Unvaccinated (?)	Imbecile, workhouse.
67	O. 18	H. S.	F.	20	„ 12	—	Recovered	Vaccinated	*See* No. 113.
68	66	N. S.	M.	21	„ 13	—	„	4 good marks	Not traced.
69	69	W. H. S	M.	17	„ 13	Dec. 16	„	4 „	Probably connected with Smith Street outbreak, Chadderton.
70	57	S. E. T.	F.	15	„ 15	„ 15	„	2 „	Daughter of No. 55.
71	53	E. F.	F.	52	„ 15	„ 16	„	Unvaccinated	Same house as B—— family, Nos. 50, 58, 59. Said to have had small-pox in childhood.
72	71	A. I.	F.	21	„ 17	„ 18	„	2 good marks	Probably contracted from her brother in Manchester.
73	72	M. J. C.	F.	37	„ 17	„ 18	„	2 marks	Not traced.
74	57	E. A. T.	F.	35	„ 17	„ 18	„	4 faint marks	Husband, No. 55, removed to hospital Dec. 3.
75	76	A. S.	F.	65	„ 18	„ 19	„	1 indistinct mark	Connected with Smith Street series, Chadderton.
76	78	A. G. T.	F.	30	„ 18	„ 19	„	2 faint marks	Not traced.
77	79	A. H.	F.	24	„ 20	„ 20	„	2 good „	„
78	80	E. C.	M.	33	„ 20	„ 22	Died	1 good mark	„
79	O. 16	— D.	M.	—	„ 20 (about)	—	Recovered	No information	Father of Nos. 91, 92.
80	O. 13	C. W. T.	M.	19	„ 25	—	„	„	Discharged from scarlet fever ward Dec. 18 an overlooked or concealed case.
81	81	E. R.	F.	45	„ 28	Dec. 28	„	4 good marks	Not traced.
82	O. 19	A. W.	F.	23	„ 30	—	„	Vaccinated	*See* No. 113.
83	82	A. S.	M.	36	„ 31	Jan. 1	Died	4 fair marks	Not traced.
84	—	C. C.	F.	3	„ 31	„ 3	Recovered	"Under" vaccination. Dec. 27.	Infected by father, No. 78.

—	Reference to Map, and overlooked Cases (O).	—	—	—	Date of Rash.	Date of Removal to Hospital.	Result.	Vaccination.	Remarks.
85	—	M. H.	M.	6	Jan. 1,1893	Jan. 2	Died	Unvaccinated -	Son of No. 119.
86	—	J. B.	M.	49	„ 1	„ 3	Recovered	1 good mark -	From workhouse.
87	O.17	— B.	M.	—	„ 1 (about)	—	„	No information -	Father of No. 112, contracted from Smith Street, Chadderton.
88	—	G. L.	M.	45	„ 2	Jan. 2	„	2 marks - -	From workhouse.
89	—	E. C.	F.	28	„ 2	„ 3	„	2 fair marks. Re-vaccinated, Dec. 27.	Mother of No. 84; infected by her husband, No. 78.
90	O.20	F. W.	M.	18	„ 2	—	„	Vaccinated -	*See* No. 113.
91	O.14	C. D.	M.	7	„ 3 (about)	Jan. 18	„	4 marks - -	Son of No. 79.
92	O.15	G. D.	F.	5	„ 3	„ 18	„	Unvaccinated -	Daughter of No. 79.
93	O.21	M. W.	F.	16	„ 4	—	„	Vaccinated -	*See* No. 113.
94	O.22	E. W.	F.	12	„ 4?	—	„		
95	—	M. A. G.	F.	28	„ 8	Jan. 10	„	2 marks - -	Not traced.
96	—	A. W.	M.	22	„ 8	„ 10	„	2 „ - -	„
97	—	J. P.	M.	26	„ 8	„ 8	„	1 mark - -	„
98	—	L. T.	F.	11	„ 9	„ 10	„	Unvaccinated -	Sister to No. 80.
99	—	E. T.	F.	16	„ 9	„ 10	Died	„ -	„ „
100	—	A. L.	M.	19	„ 9	„ 12	Recovered	2 faint marks -	Not traced.
101	—	T. H. W.	M.	24	„ 10	„ 11	„	1 mark - -	„
102	—	N. E. L.	F.	15	„ 10	„ 13	„	3 fair marks -	
103	—	J. T.	M.	41	„ 11	„ 11	„	1 faint mark -	„
104	—	S. S.	M.	19	„ 11	„ 12	„	2 faint marks -	„
105	—	R. C.	M.	45	„ 11	„ 12	Died	2 marks - -	„
106	—	E. S.	F.	—	„ 12	„ 13	„	Unvaccinated -	Contracted from father, who died from small-pox, No. 83.
107	O.24	J. S.	M.	26	„ 12?	—	Recovered	Vaccinated -	*See* No. 113.
108	—	P. D.	M.	23	„ 13	Jan. 15	„	3 good marks -	Not traced.
109	—	D. B.	M.	5	„ 14	„ 15	„	Unvaccinated -	Contracted from case at Chadderton, *vide* Table, No. 62, whom he visited when ill.
110	O.23	L. W.	M.	25	„ 15?	—	„	Vaccinated -	*See* No. 113.
111	—	J. T.	F.	51	„ 15	Jan. 17	Died	2 marks - -	Not traced.
112	—	M. B.	F.	46	„ 15	„ 20	Recovered	2 good marks -	Probably infected by father, No. 87. Is mother of Nos. 113, 118, 123.
113	—	E. S.	M.	1	„ 16	„ 20	Died	Unvaccinated -	First case to be recognised of large family; who attacked from Dec. 12 (O. 18-27); all mild.
114	—	M. J. D.	F.	34	„ 17	„ 18	„	4 marks - -	Mother of Nos. 91 and 92.
115	—	L. D.	F.	4	„ 17	„ 18	„	Unvaccinated -	Another child of No. 114.
116	—	E. T.	M.	18	„ 17	„ 20	Recovered	2 marks - -	Workhouse inmate; slept with No. 88 on Jan. 1, before rash.
117	—	T. B.	M.	4	„ 17	„ 21	„	Unvaccinated -	Traced in connexion with Nos. 91 and 92.
118	—	S. E. B.	F.	11	„ 17	„ 20	„	„ -	Probably infected by grandfather, No. 87.
119	—	M. H.	F.	30	„ 18	„ 19	„	1 mark - -	Mother of No. 85.
120	O.25	— W.	M.	53	„ 18?	—	—	Vaccinated -	*See* No. 113.
121	O.26	— W.	F.	50	„ 18?	—	—	„ -	
122	O.27	H. W.	M.	9	„ 19?	—	—	„ -	
123	—	M. A. B.	F.	—	„ 21	Jan. 21	—	—	Probably infected by her grandfather, No. 87.
124	—	T. R.	M.	21	„ 21	„ 21	—	—	—

OLDHAM AND CHADDERTON.

APPENDIX II.

OLDHAM.

Re-vaccination of Infected Households.

TABLE SHOWING EXTENT OF RE-VACCINATION OF INFECTED HOUSEHOLDS (prepared by Dr. Niven).

Reference to Map.*	Address.	Case.	Reference to Table of Cases (Appendix I.).	Were the Family Vaccinated ?	How long after Removal of Case.	Neighbours and Relations vaccinated ?	Cases arising subsequent to Removal of First Case and dependent on it.		No. of Members of Family to be vaccinated after Removal of Case.	Remarks.
							In Family.	Among Neighbours.		
1	34, Overens Street	C. B.	3	Yes.	"Too late."	None.	None.	None.	2	
2	60, Overens Street	H. C.	5	„	Directly.	2 relations, directly.	„	„	1	Wife nursed him in hospital.
4	119, Lees Road -	T. B.	1	No.	—	No.	„	Not known.	5	Already perhaps 2 cases in the house.
7	33, Norbury Street	W.W.	6	„	—	„	„	None.	3	
9	163, Radcliffe Street.	C. B.	8	„	—	„	„	„	3	4 cases in this household about same time.
12	303, Featherstall -	J. B.	12	Yes.	Same night.	„	„	„	9	
13	8a, Morton Street	S. M.	14	No.	—	„	„	„	4	
14	Workhouse -	A. P.	13	„	—	—	Yes.	—	—	Other cases followed in workhouse.
16	6, Brompton Street	E. H.	16	Yes.	A few days.*	No.	None.	None.	7	* The father vaccinated 14 days after.
17	931, Hollin's Road	M. A. R.	15	„	Same day.	„	„	„	3	
18	53, Heap Street -	J. T.	17	„	A few days.	„	„	„	4	
19	Workhouse -	J. S.	18	No.	—	—	„	—	—	
20	17, Alton Street -	M. N.	19	Mother and 2 children.	A day or two.	No.	Yes (1).†	None.	8	† Vaccinated after admission ; did not take. (No. 27 in table.)
21	278, Chadderton Road.	A. S.	20	Yes.	Same and next day.	Inmates of Nos. 280 and 282, C. Road, 3 weeks after.	No.	„	7	
22	21, Bloom Street -	A. N.	26	No.	—	No.	„	„	3	
26	342, Rochdale Road	F. L.	24	Yes.	Next day.	„	„	„	4	
28	3, Welbeck Street	F. B.	28	Mother and 1 child.	Mrs. B., in hospital ; child 8 days after.	„	„	„	6	
30	6, Emmanuel Street.	J. S. W.	30	Mother.	3 weeks.	„	„	„	2	
33	29, York Street -	W. S.	32	No.	—	„	„	„	1	
34	55, Brompton Street.	G. G.	33	Yes.‡	—	„	„	„	7	‡ Except mother (who had had small-pox previously) and youngest child.
35	22, Chelmsford Street.	T. B.	36	„	2 days.	„	„	„	5	
36	"Highland Laddie."	W. C.	37	„	Day after.	„	„	„	7	
37	80, Coldhurst Street	G. C.	39	„§	„	„	„	„	6	§ All except father and one young boy.
38	83, Franklin Street	A. W.	41	„	4 days.	„	„	„	4	
42	32, Welbeck Street	F. J.	44	No.	—	„	Yes.	„	6	
44	223, Shaw Road -	S. J. B.	45	1 member and an aunt.	At once.	„	No.	„	2	Husband had small-pox.
46	34, Grange Street	R. D.	46	Yes.	„	„	„	„	8	
49	457, Lees Road -	J. C.	48	„	„	Yes (relatives).	Yes (2 cases).‖	Yes (1 case next door).	3	‖ These 2 cases were not re-vaccinated. A set. 21, who had been re-vaccinated did not take small-pox.
50	21, Caroline Street	M. A. H.	49	The father.	Next day.	No.	No.	None.	2	
53	8, Cherwell Street	H. B.	50	Yes.	2 days.	„	Yes (3 cases).	„	4	
52	124, Chadderton Road.	J. J. M.	51	„	Next day.	„	No.	„	4	
—	Workhouse -	S. I.	2	The whole ward.	At once.	—	None.	—	—	
—	„	E. W.	53	„	„	—	„	—	—	
54	2, Gas Street -	J. Y.	54	Yes.	„	No.	„	None.	4	
61	185, West Street -	J. G.	61	„	Next day.	„	„	„	3	
65b	4, Franklin Street	J. W.	65	„	Same and next day.	Mrs. A. of 33, Eden Street.	„	„	2	
66	14, Hodgson Street	N. S.	68	No.	—	No.	„	„	7	
67	18, Fishwick Street	J. T.	55	Yes.	Day of discharge of father from hospital.	„	Yes (2 cases).	„	6	
69	32, Camden Street	W.W. S.	69	Yes, 1 child ; No, 2 adults.	Same day.	„	None.	„	3	

* Not reproduced.

Reference to Map.*	Address.	Case.	Reference to Table of Cases (Appendix I.).	Were the Family Vaccinated?	How long after Removal of Case.	Neighbours and Relations vaccinated.	Cases arising subsequent to Removal of First Case and dependent on it.		No. of Members of Family to be vaccinated after Removal of Case.	Remarks.
							In Family.	Among Neighbours.		
71	6, Clark Street -	H. I.	72	Yes.	Next day.	No.	None.	None.	1	
72	35, Cottam Street	M. J. C.	73	„	Same day.	„	„	„	5	
78	87a, Horridge Street.	A. G. T.	76	„	Next day.	„		„	1	
76	331, Manchester Road.	A. S.	75	Yes (did not take).	Same night and 3 days after.	„	„	„	3	
79	18, Main Road -	A. H.	77	„	At once.	„	„	„	4	
80	37, Lord's Hill Street.	E. C.	78	Yes.	A week.	„	Yes (3 cases).*	„	4	* "Under" vaccination.
81	59, Rock Street -	E. R.	81	„	Next day.	„	None.	„	6	
82	4, Ct. 1, Manchester Road.	R. S.	83	Yes, 1.	On removal of second case.	„	Yes.	„	5	
—	6, Gale Street -	M. H.	85	Yes, 4; no, 4.	Same day.	„	„†	„	7	† Mrs. H., who was not re-vaccinated.
—	528, Hollin's Road	J. P.	97	Yes.	Same day, 1; next day, 1.	„	None.	„	2	
—	90, Franklin Street	M. Y.	95	No.	—	„	„	„	5	
—	28, Worcester Street.	A. W.	96	„	—	„	„	„	5	
—	9, Solomon Street	E. T.	99	Yes.	At once.	„	„	„	4	
—	2, Marmaduke Street.	J. H. W.	101	No.	—	„	Yes.	,	7	
—	264, Featherstall Road, N.	J. T.	103	Yes.	At once.	„	None.	„	8	
—	79, Crossbank Street.	R. C.	105	„	„	„	„	,	6	
—	2, Ct. 2, Emmanuel Street.	S. S.	104	No.	—	„	„	„	2	
—	387, Featherstall Road, N.	A. L.	100	All the children.	Next day.	„	„	„	8	
—	36, Welbeck Street	R. L.	102	No.	—	„	„	Yes ?‡	7	‡ A child taken to house after its thorough disinfection: presented eruption 14 days later.
—	82, Main Road -	D. B.	109	All but parents.	2 days.	„	Yes (the father).	None.	10	
—	74, Jemmie Lane -	P. D.	108	Yes.	Same day.	„	None.	„	4	
—	20, Sylvan Street -	J. T.	111	„	At once.	„	„	„	3	
—	3, Lee Street -	M. J. D.	115	Yes; did not take.	„	„	„	„	4	All had had small-pox very slightly.

* Not reproduced.

OLDHAM AND CHADDERTON.

APPENDIX III.

TABLE OF CASES OF SCARLET FEVER VACCINATED IN OLDHAM.—(Dr. Niven.)

No.	Address and Name.	Age.	Admitted.	Vaccinated.	Number of Marks on Admission.	Number of Marks put on.	Number taken.
		Years.	1892.				
1	14, Knott Street, Eliza Fildes	4	Aug. 1	Sept. 2	Not vaccinated.	3	None.
2	28, Essex Street, Mary Garnett	10	„ 9	„ 25	2	3	2
3	12, Spring Street, Fred Jenkinson	11	„ 22	„ 25	3	3	3
4	2A, Adelphi Street, Sarah E. Roberts	7	„ 22	„ 25	Not vaccinated.	3	3
5	167, Henshaw Street, Lily Hudson	5	„ 30	„ 25	None	3	3
6	20, Chapel Street, Mary Price	3	„ 30	Oct. 2	Not vaccinated.	3	2
7	Infirmary, Ada S. Byford	22	Sept. 1	„ 12	1	3	3
8	5, Houson Street, Hannah Deering	19	„ 2	„ 12	2	—	2
9	20, Portland Street, Edith Price	8	„ 6	Sept. 25	1	1	1
10	15, Bankside Street, Betsy Openshaw	10	„ 6	„ 25	1	1	1
11	Infirmary, Jessie Sheldon	19	„ 8	Oct. 12	3	—	3
12	20, Portland Street, Harold Price	2	„ 10	Sept. 24	None	3	3
13	68, Newbreak Street, John Buckley	4	„ 13	Oct. 2	Not vaccinated.	2	2
14	Do. William Buckley	6	„ 16	„ 2	Do.	—	2
15	42, Pitt Street, Harriet Blair	16	„ 17	„ 12	Do.	3	3
16	37A, Nuggett Street, James Cleminshaw	4	„ 20	„ 2	Do.	3	3
17	Do. Rachel Cleminshaw	9	„ 20	„ 2	Do.	3	3
18	4 Court, 3, Lord's Hill Street, Patrick Fitton	10	„ 21	„ 2	4	—	2
19	Do. do. Mary Fitton	8	„ 21	„ 2	Not vaccinated.	—	3
20	Do. do. Maggie Fitton	6	„ 21	„ 2	Do.	—	3
21	Do. do. Elizabeth Fitton	4	„ 21	„ 2	Do.	—	3
22	53, George Street, Harold Collinge	2	„ 22	„ 26	Do.	3	3
23	37A, Nuggett Street, A. Cleminshaw	7	„ 29	„ 2	Do.	3	3
24	Do. W. Cleminshaw	12	„ 20	„ 2	Do.	3	3
25	45, Mortimer Street, Mary Wells	6	Oct. 5	„ 5	None	4	4
26	58, Newbreak Street, Eliza Ashworth	22 months.	„ 5	„ 5	Do.	3	2
27	14, Flower Street, Edward Whittaker	2	„ 6	„ 26	Not vaccinated.	—	3
28	29, Cow Lane, Mary Ann Staley	22 months.	„ 7	„ 12	None	3	3
29	7, Rowbottom Street, Mark Robinson	13	„ 10	„ 12	Not vaccinated.	3	3
30	44, Keverlon Street, Sarah May	9	„ 11	„ 12	3	3	3
31	76, London Road, Lily Sugden	16	„ 21	„ 23	4	3	3
32	Do. John Henry Sugden	10	„ 21	„ 23	4	4	4
33	9, Mount Pleasant Street, Nellie Cooper	5	„ 22	„ 23	None	3	3
34	Do. do. Harry Cooper	3	„ 22	„ 23	Do.	3	3
35	Do. do. Frank Cooper	20 months.	„ 22	„ 23	Do.	3	Died Oct. 26.
36	21, Esther Street, Lizzie Eddington	9	„ 24	„ 26	3	4	1
37	9, Mount Pleasant Street, Mrs. Cooper	27	„ 24	„ 26	3	3	3
38	33, Boston Street, Mary E. Gamble	5	„ 27	Nov. 13	Not vaccinated.	3	3
39	69, Wellington Street, Edwin Etchells	5	„ 29	„ 3	Do.	3	3
40	1, Frome Street, Mary Wild	11	Nov. 5	„ 13	4	3	3
41	264, Featherstall Road, N., Maria Taylor	15	„ 7	„ 13	4	3	3
42	Do. do. Nancy Taylor	11	„ 7	„ 13	2	3	3
43	Blue Coat School, John Berry	13	„ 12	„ 13	4 good	4	4
44	Workhouse, Tommy Driskin	3	„ 12	„ 19	3 do.	3	0
45	9, Solomon Street, C. W. Till	19	„ 15	„ 19	4 do.	3	0
46	42, Edith Street, Florence Holt	9	„ 15	„ 19	1 faint	3	0
47	498, Ashton Road, George King	5	„ 15	„ 19	2 good	3	0
48	7, Orme Street, Winifred Lees	10	„ 16	„ 19	1	3	0
49	152, Edge Lane Road, J. A. Ward	10	„ 16	„ 19	3	3	0
50	9, Houson Street, Alice Hulme	6	„ 16	„ 19	4	3	1
51	95, Brompton Street, W. Allinson	4	„ 24	„ 27	Not vaccinated.	3	1
52	47, Hanson Street, James Boyd	5	Dec. 2	Dec. 7	Do.	3	3
53	61, Pollard Street, Alice Bates	6	Nov. 22	Nov 27	4	3	0
54	7, Walshaw Street, Mary Pearson	7	Dec. 6	Dec. 7	None	3	3
55	Do. Albert Pearson	12	„ 6	„ 7	2	3	0
56	Do. Abel Pearson	10	„ 6	„ 7	3	3	1
57	Do. Clara Pearson	15	„ 6	„ 7	3	3	3 slightly.
58	76, Carlisle Street, Florence Godfrey	4	„ 13	„ 13	None	3	3
59	408, Ashton Road, Hannah Dean	15	„ 8	„ 12	4	3	3
60	76, Carlisle Street, John Godfrey	2	„ 13	„ 13	None	3	3
61	229, Ashton Road, Mary A. Fletcher	10	Nov. 29	„ 7	Do.	3	3
62	65, Roundthorn Road, Hannah Swift	8	„ 26	Nov. 27	2	—	3
63	15, Bowden Street, Fred Briscoe	10	„ 25	„ 27	None	3	1
64	65, Roundthorn Road, Minerva Swift	12	„ 25	„ 27	2	—	1
65	11, Durham Street, Amy Royle	4	Dec. 13	Dec. 13	None	3	3
66	408, Ashton Road, Thomas Dean	7	„ 12	„ 13	1	—	2

APPENDIX IV.

CHADDERTON.

SMALL-POX, 1892–93.

Table of Cases.

No.	Name.	Sex.	Age.	Notified.	Rash.	Removal to Hospital.	Result.	Vaccination.	Remarks.	Other Inmates of invaded Houses.		
										Total.	No. re-vaccinated.	Additional Cases.
*1	S. M.	F.	2	Mar. 1	Feb. 29	Mar. 1	Died	Unvaccinated	. . . .	4	4	
2	J. E. G.	M.	24	Not.	Mar. 26	Apr. 17	Recovered.	3 marks	A lodger at house of No. 3.			
3	A. H.	F.	25	Apr. 17	Apr. 17	„ 19	Died	4 good marks				
4	A. H.	F.	2	„ 17	„ 13	„ 19	Recovered.	Unvaccinated				
5	F. H.	F.	6	„ 22	„ 21	„ 22	„	4 good marks	Visited and played with children of No. 3. Both these cases were so slight as to be doubtful. They were re-vaccinated in hospital, and did not take. Rash indefinite.			
6	F. H.	M.	4	„ 24	„ 24	„ 24	„	4 fair „				
7	D. C.	M.	47	May 3	May 2	May 4	„	2 marks.				
*8	S. J. E.	F.	25	Sept. 19	Sept. 17	Sept. 19	„	3 fair marks	. . . .	2	1	
*9	M. A. T.	F.	32	—	„ 22	„ 23	„	2 „ „	. . . .	2	2	
*10	J. T.	M.	29	—	„ 23	„ 24	„	2 „ „	. . . .	3	3	
11	E. L.	F.	14	—	About Oct. 20	—	„	. . . .	Sister to Nos. 15, 16, 20.			
12	S. T.	F.	27	Oct. 23	„ 22	Oct. 23	„	3 good marks	14 days before she had been to workhouse. Visited house of father, where there was small-pox.			
*13	H. D.	F.	26	Nov. 6	Nov. 4	Nov. 6	„	Unvaccinated	Two unsuccessful attempts at vaccination.	1	—	
*14	E. A. F.	F.	18	„ 7	„ 5	„ 7	„	3 good marks	Living near Oldham cases Nos.	7	1 (primary).	
15	R. L.	M.	16	—	?	—	Died Nov. 9	. . . .	Brother to No. 11, but case of R. L. was reported as death from malignant scarlet fever. Nos. 16 and 20 are of same family.			
16	T. L.	M.	12	Nov. 17	Nov. 11	Nov. 18	Recovered.	Vaccinated marks?	Brother to Nos. 11, 15, 20.			
*17	J. P. B.	M.	8	„ 11	„ 11	„ 11	„	3 marks	A very slight case	7	7	
18	E. A.	F.	24	„ 16	„ 14	„ 16	„	2 good marks	Wife to No. 22. Neighbour to No. 11, &c.			
*19	T. B.	M.	26	„ 20	„ 18	„ 21	„	2 „ „	. . . .	2	—	Nos. 24, 25
20	M. L.	F.	9	„ 21	„ 20	„ 21	„	2 „ „	Sister to Nos. 11, 15, 16.			
21	D. R.	M.	9	—	„ 23	—	„	Vaccinated	Not reported. Same family as Nos. 29, 30, 31, 32, 33, 34. Neighbour to No. 11, &c.			
22	J. A.	M.	27	Nov. 26	„ 25	Nov. 26	„	3 fair marks	Husband to No. 18.			
23	J. A.	M.	2	„ 26	„ 26	„ 26	„	2 recent marks, "under" vaccination.	Child of Nos. 18 and 22.			
*24	R. B.	M.	5 mos.	Dec. 1	„ 30	Dec. 1	„	4 recent, Nov. 25, "under" vaccination.	Child of No. 19.			
*25	L. B.	F.	25	—	Dec. 3	„ 1	„	3 good	Wife of No. 19.			
*26	R. M.	M.	6	Dec. 3	Nov. 30	„ 3	Died	Unvaccinated	Child of No. 39	4	4	No. 39.
27	S. McN.	F.	28	„ 8	Dec. 7	„ 8	Recovered.	2 marks	. . . .	2	2	
*28	T. H.	M.	21	—	„ 7	„ 9	„	4 fair	. . . .	7	7	
29	E. R.	F.	2	Dec. 10	„ 9	„ 10	„	Unvaccinated	Attempted vaccination, Dec. 10. Sister to No. 21.			
30	L. R.	F.	17	„ 10	„ 9	„ 10	„	4 good	Sister to 21 and 29.			
31	I. R.	M.	38	„ 10	„ 9	„ 10	„	1 mark	Father of 21, 29, 30.			
32	S. R.	F.	36	„ 10	„ 9	„ 10	Died	1 mark	Wife of 31; mother of 21, 29, 30.			
33	A. R.	F.	2 mos.	„ 10	„ 9	„ 10	„	Unvaccinated	Child of 31 and 32.			
*34	D. S.	F.	61	„ 11	„ 10	„ 11	Recovered.	„	Mother of No. 37	4	4	No. 37, whose re-vaccination did not "take."
35	L. S.	F.	2	„ 12	„ 11	„ 12	„	„	. . . .			
36	G. R.	M.	9	„ 15	„ 14	„ 15	„	2 marks	Same family as Nos. 21, 29-33. He was sent to hospital from the workhouse.			
37	L. L.	M.	23	„ 15	„ 14	„ 15	„	1 „				
*38	F. D.	M.	16	„ 14	„ 13	„ 14	„	Vaccinated	Brother to Nos. 53, 56, 59	6	—	Nos. 56, 59.
*39	R. M.	M.	37	„ 15	„ 15	„ 16	„	3 faint marks	Father of No. 26.			
*40	E. T.	F.	30	„ 18	„ 18	„ 18	„	1 small mark	. . . .	2	2	
*41	E. H.	F.	47	„ 19	„ 19	„ 19	„	2 „ marks	. . . .	4 (1 had small-pox).	3	

OLDHAM AND CHADDERTON.

No.	Name.	Sex.	Age.	Notified.	Rash.	Removal to Hospital.	Result.	Vaccination.	Remarks.	Other Inmates of invaded Houses. Total.	No re-vaccinated.	Additional Cases.
*42	S. W.	F.	14	Dec. 20	Dec. 19	Dec. 20	Recovered.	2 good marks	-	9	9	
*43	J. H.	M.	17	—	—	—	"	Vaccinated	These two cases were not reported. Same house as Nos. 45, 47, and next door neighbours to No. 48.	2 (who had small-pox in youth).		
*44	L. H.	F.	16	—	—	—	"	"				
*45	E. C.	F.	4	Dec. 21	Dec. 20	Dec. 21	Died	Unvaccinated	*See* 43 and 44			
*46	M. W.	F.	18	" 20	" 19	" 20	Recovered.	2 poor marks	-	3	3	
*47	F. E.	M.	24	" 21	" 20	" 21	"	3 marks	*See* 43 and 44, same house.			
*48	E. H.	F.	13	" 20	" 18	" 21	"	3 good marks	" "	3	—	
49	J. L.	M.	32	" 20	" 19	" 22	"	2 " "	-			
*50	H. B.	F.	13	" 22	" 20	" 22	"	2 " "	-	2	2	
*51	J. W.	M.	24	" 24	" 24	" 24	"	1 mark	-	3	2	
*52	E. A. A.	F.	48	" 24	" 22	" 24	"	2 marks	-	4	4	
*53	J. C. D.	M.	20	" 26	" 25	" 26	"	Unvaccinated	Brother to Nos. 38, 56, 59.			
*54	J. S.	M.	32	" 28	" 24	" 26	"	3 marks	-	4	4	
*55	A. W.	F.	11	" 25	" 24	" 26	"	Vaccinated	-	7 (father had small-pox, 1888).	2	
*56	A. D.	F.	14	" 27	" 26	" 27	"	1 faint mark	Sister to Nos. 38, 53, 59.			
*57	E. S.	F.	25	" 26	" 22	" 27	"	4 marks	Daughter of No. 34.			
*58	J. S.	M.	39	" 27	" 25	" 27	"	"	-	5	4	
*59	M. D.	F.	18	" 27	" 27	" 28	"	4 recent (Dec. 27). "under" vaccination.	Sister to Nos. 38, 53, 56.			
*60	A. B.	F.	23	—	" 19	" 30	"	2 good marks	An overlooked case, infected by her brother; also entirely "missed," but severe.	2	—	
*61	E. B.	F.	15 mos.	—	" 24	" 30	"	Unvaccinated	Child of No. 60; infected by uncle.			
*62	A. L.	M.	23	Jan. 5	Jan. 5	Jan. 5	"	2 good marks	Infected by his wife (unreported).	2	2	
63	S. W.	F.	32	" 6	" 5	" 6	"	2 marks.				
*64	G. T.	M.	27	" 9	" 9	" 9	"	2 good marks	-	2	2	
*65	J. Y.	M.	18	" 10	" 10	" 10	"	" "	-	6	6	
*66	F. T.	F.	15	" 10	" 9	" 10	"	2 marks	-	9	9	
*67	M. M.	F.	19	" 10	" 9	" 10	"	2 good marks	-	3	2	
*68	G. H. C.	M.	10	" 10	" 8	" 10	"	2 marks	-	5	5	
*69	J. B.	M.	6	" 11	" 11	" 11	Died	Unvaccinated	-	5	5	One developed small-pox later; his re-vaccination failed.
*70	T. H. S.	M.	28	" 11	" 8	" 11	Recovered.	2 marks	-	1	1	
*71	T. L.	M.	42	" 11	" 10	" 11	Died	Unvaccinated	-	8	8	
*72	G. P.	M.	37	" 12	" 10	" 12	Recovered.	2 good marks	-	2	2	
*73	H. H.	M.	28	" 12	" 10	" 12	"	2 faint "	-	1	1	
*74	T. B.	M.	41	" 12	" 9	" 12	"	2 large "	-	9	9	
*75	E. C.	F.	17	" 12	" 11	" 12	"	Unvaccinated	-	6	6	
*76	H. S.	M.	6	" 12	" 11	" 12	"	"	-	5	5	No. 87.
*77	R. P.	M.	4	" 13	" 9	" 13	"	"	-	6	6	
*78	E. H.	F.	1	" 13	" 11	" 13	"	"	-	6	6	
*79	C. S.	F.	34	" 15	" 13	" 15	"	3 marks	-	5	5	
*80	S. J. D.	F.	25	" 15	" 14	" 15	"	2 good marks	Engaged in "cleaning up" at house of No. 61 after its fumigation.	3	3	
*81	H. C.	F.	26	" 15	" 13	" 16	"	1 " "	Probably infected by No. 61.	2	2	Both developed small-pox later.
*82	J. C. C.	M.	28	" 16	" 12	" 16	"	2 " "	" "			
*83	J. W. S.	M.	25	" 18	" 15	" 18	"	2 marks	-	5	5	
*84	M. J. K.	F.	23	" 19	" 18	" 19	"	"	-	2	1	
*85	J. B.	M.	10 days	" 19	" 19	" 19	"	Unvaccinated	The mother of this infant died suddenly, just before, from small-pox?	6	6	
*86	W. A.	M.	29	" 19	" 19	—	"	Vaccinated	-	2	1	
*87	T. S.	M.	48	" 20	" 18	Jan. 20	"	2 good marks	Father of No. 76.			
*88	J. S.	M.	32	" 20	" 20	" 20	"	1 " "	-	6	4	
*89	H. B.	F.	22	" 20	" 18	" 20	"	3 fair "	-	2	2	

Cases marked * are attributed by Dr. Patterson to infection from the Westhulme Hospital.

APPENDIX V.

CASES occurring in HOUSES regarded by DR. PATTERSON as "within the Hospital Area."

		No. of Cases in Street.
61, Bamford Street	No. 17	6
98, „ „	„ 74	
101, „ „	„ 9	
105, „ „	„ 76, 87	
106, „ „	„ 80	
Bare Tree Farm	„ 66	1
31, Bentley Street	„ 85	5
56, „ „	„ 38, 53, 56, 59.	
12, Brierley Street	„ 1	4
18, „ „	„ 64	
27, „ „	„ 34, 57	
10A, Burnley Lane	„ 26, 39	6
71, „ „	„ 86	
79, „ „	„ 68	
81, „ „	„ 69	
115, „ „	„ 78	
7, „ Street	„ 75	3
13, „ „	„ 72	
(Back) „ „	„ 67	
55, Bush Street	„ 43, 44, 45, 47.	7
57, „ „	„ 48	
75, „ „	„ 81, 82	
2, Chancery Street	„ 52	2
24, „ „	„ 55	
9, Denmark Street	„ 88	4
16, „	„ 19, 24, 25	
2, Duke Street	No. 70	2
30, „ „	„ 40	
76, Garforth Street	„ 84	1
109, „ „	„ 52	3
235, „ „	„ 58	
27, Granville Street	„ 73	1
50, Hamilton Street	„ 77	1
8, March Street	„ 54	2
11, „ „	„ 10	
Middleton Road	„ 83	3
558, „ „	„ 89	
663, „ „	„ 41	
244, Milne Street	„ 60, 61	3
2, Upper Milne Street	„ 8	
1, Ogden Street	„ 46	2
2, „ „	„ 13	
8, Radcliffe Street	„ 50	1
46, Russell Street	„ 71	1
4, Slater Street	„ 14	2
10, „ „	„ 51	
66, Victoria Street	„ 79	3
160, „ „	„ 28	
9, Lower Victoria Street	„ 42	
2, Wellington Street	„ 65	1
		63

APPENDIX VI.

OLDHAM UNION.

VACCINATION RETURNS.—1872–1892.

Year.	Births registered during Year.	Of the children whose births were registered during the year given in the first column, by the 31st January in the year next but one following that year there were: Successfully vaccinated.	Certified as insusceptible of vaccination.	Had Small-pox.	Died unvaccinated.	Vaccination postponed by medical certificate.	Remaining.	The children not finally accounted for (including cases postponed) being per cent. of births.
1872	5,088	4,472	3	2	470	141		2·8
1873	5,265	4,519	5	0	571	15	155	3·2
1874	5,403	4,622	6	0	595	39	141	3·3
1875	5,456	4,580	5	0	603	56	212	4·9
1876	5,883	4,974	7	0	619	64	219	4·8
1877	6,084	5,104	5	4	625	36	310	5·7
1878	6,112	5,069	7	1	649	49	337	6·3
1879	5,817	4,812	2	0	564	70	369	7·5
1880	5,832	4,497	7	0	712	73	543	10·6
1881	5,837	4,417	14	0	666	160	580	12·7
1882	6,040	4,493	5	0	735	131	676	13·4
1883	6,209	4,506	13	0	726	208	756	15·5
1884	6,481	4,488	15	0	865	198	915	17·2
1885	6,670	4,593	16	0	834	218	1,009	18·4
1886	6,388	3,798	22	0	804	173	1,591	27·6
1887	6,361	2,636	19	0	899	176	2,631	44·1
1888	6,348	1,583	18	0	883	62	3,802	60·9
1889	6,176	892	8	0	889	29	4,358	71·0
1890	5,994	524	8	0	1,002	21	4,439	74·4
1891	6,319	303	4	0	1,042	6	4,964	78·7
1892	6,004	340	0	0	911	0	4,753	79·2

VI.—Report on the Prevalence of Small-Pox at Leeds, 1892-93.

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Cases at Common Lodging-houses.
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(2.) *Stoney Croft.*
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Manston Hall Estate.

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Persons Attacked.

§ 3.—*Small-pox in* 1892-93:—
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Early History of Outbreak.
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§ 1. *Leeds: Sanitary Administration, as regards Epidemic Diseases.*

Population of Leeds. Death-rate.

At the census of 1891, Leeds (which has lately been raised to the dignity of a "city") had a population of 367,506. The general death-rate in that year was 22·91 per 1,000 (as against 22·71 in 1890), the mortality varying in the several municipal wards, 16 in number, from 16·9 in Headingley to 32·4 in the East ward (*see* Appendix I.). The zymotic death-rate was 2·41, being a rise of only 0·01 over that 1890, and a decrease of 0·37 from that of the five years 1885-9, which yielded a rate of 2·78.*

Wards as sanitary districts.

For sanitary purposes advantage is taken of the division of the city into 16 municipal wards, each ward serving as a sanitary district; but it may be observed that these areas are not conterminous with the registration sub-districts, which are 10 in number. The appended map (Plate XXIII.), for which I am indebted to Dr. Cameron, shows clearly how the lines of division of the registration sub-districts traverse various portions of the wards.

Sanitary department.

The Urban Sanitary Authority is the Town Council, of which the Sanitary Committee has the control of all matters relating to the public health. The Medical Officer of Health (Dr. J. Spottiswoode Cameron) is appointed by the Town Council on the nomination of the Sanitary Committee. He has the entire supervision of the sanitary department which is constituted as follows:—

Chief Nuisance Inspector;
Divisional Inspectors, two in number, one for the western and one for the eastern division of the town;
Ward Inspectors†, 16 in number;
Officers employed in removal of cases of infectious disease, in disinfecting, &c;
Workshops Inspector;
Meat Inspectors, two in number;
Canal Boats and Lodging-house Inspector;
Smoke Inspector;
Canal Boats and Lodging-house Inspector;

and, also under the department, are the superintendents of street scavenging and of ash pits, each with their own staff of men.

Duties of sanitary inspectors.

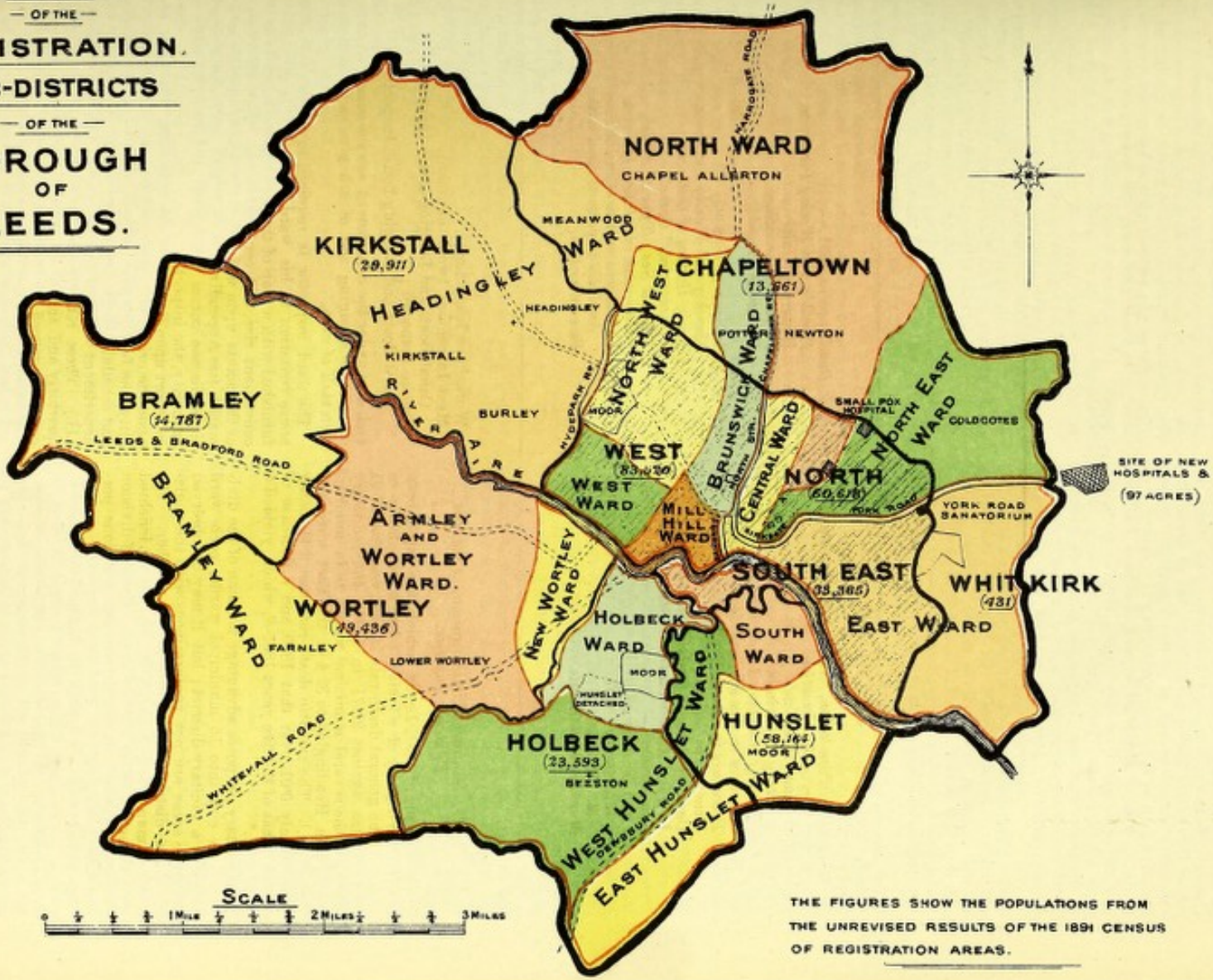
The ward inspector is required to make a house-to-house visitation in his ward, for which purpose he is furnished with a map of the district, and note-books of convenient size, and containing a printed slip of each of the points upon which he is required to gain information (*see* Appendix II.). Whenever a case of infectious disease comes under the notice of the sanitary authority, the inspector is sent forthwith to the house to report upon its condition, and to obtain facts bearing upon the origin of the illness. As regards the former duty, the facts he has noted and reported are collated and scheduled, a return being made every week by the department of the work done on this head (*see* Appendix III.). These returns are further summarised in the quarterly and annual reports, thus furnishing a very complete record of the activity of the department in the various districts. Thus in the year 1891, the number of "houses and premises completely examined on account of infective disease"* was 1,823, on account of "alleged nuisance," 1,016, and in the ordinary course of "house-to-house work," 1,493. The inspector is further required to superintend all structural alterations of property which are carried out in consequence of action taken by the sanitary authority; to see drains laid down, and to test them. Indeed he does in regard to these alterations and rectifications what the buildings inspector does for all new structures.

* *See* Dr. Spottiswoode Cameron's Annual Report to the Urban Sanitary Authority for the year 1891 (p. 3).

† Previous to 1891 there were 19 district inspectors, but in that year, opportunity was found for a re-organisation of the department, which comprised the creation of the offices of divisional inspectors, and the reduction in number of district inspectors to 16.

* In his annual report for 1891, (p. 110) Dr. Cameron, commenting on the table giving these dates, says that the term "infective disease" is used in preference to "infectious" as being more comprehensive; thus "autumnal diarrhœa" and "pneumonia" are included among the diseases for which house inspection is made, although, of necessity, the information of the occurrence of these affections is almost limited to that given in the death returns.

MAP
— OF THE —
REGISTRATION SUB-DISTRICTS
— OF THE —
BOROUGH OF LEEDS.



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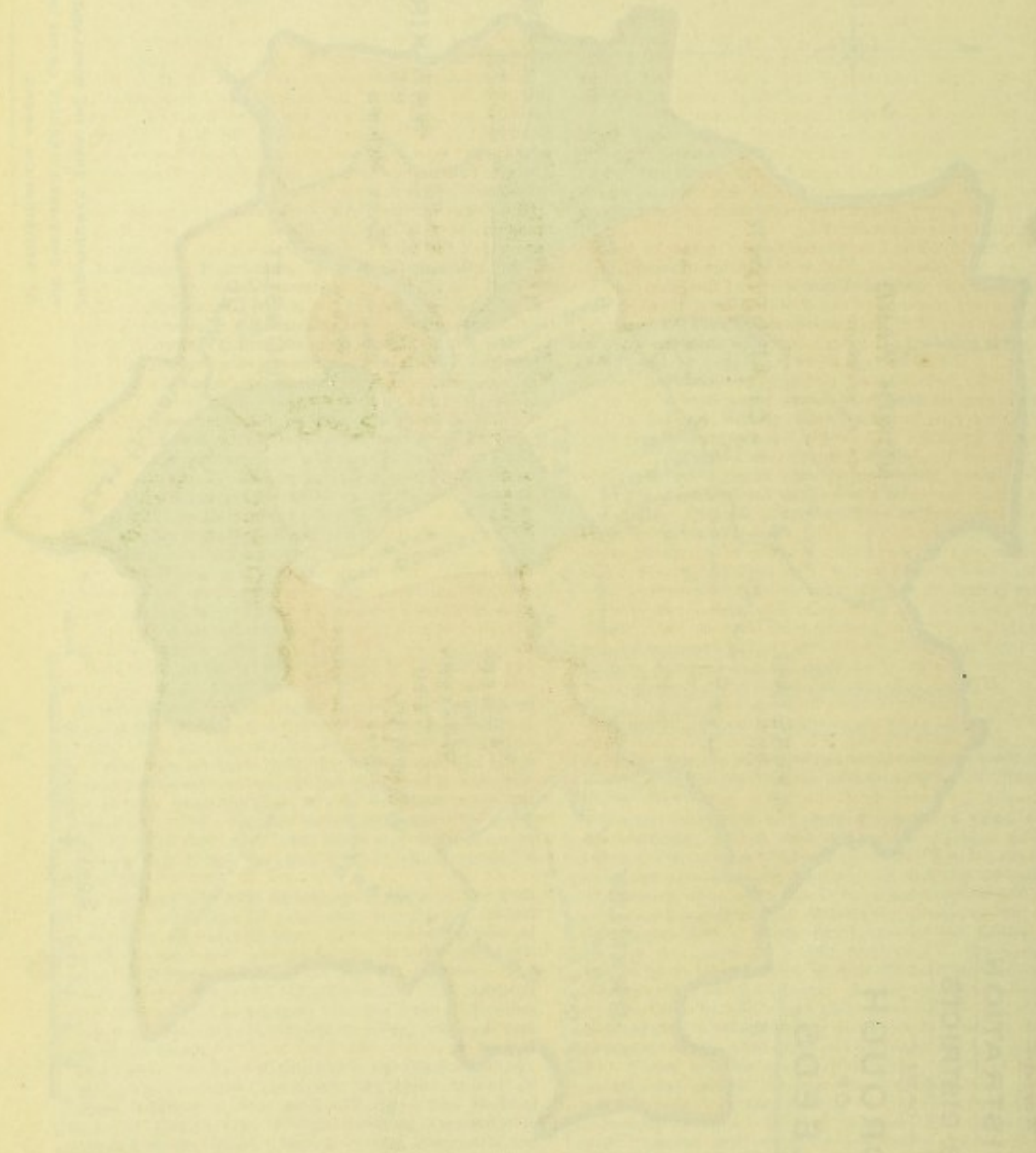
Wyman & Sons, Lt. Lith. 3019.



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The procedure adopted in Leeds with regard to the infectious diseases, differs from that in almost every other town of equal standing in the fact that compulsory notification is not enforced. The knowledge of the existence of cases of these diseases comes to the department, (1) by the voluntary notification by the medical men in attendance, (2) from the inquiries by inspectors, and (3) through the medium of the death returns. At the beginning of every week (Monday morning) the department receives from the district registrars a copy of the death returns of the preceding week on a form supplied for the purpose (*see* Appendix IV.). Every death from an infectious disease is at once noted, and steps taken to institute inquiries, which are by no means limited to the particular house in question.

The inspector enters in his note book, planned on the same lines as that for nuisances, the leading particulars of the case and of the house in which it has occurred. These facts are embodied in reports which give the details required (Appendix II. and V.).

All this information—together with other facts bearing on the case—is entered in the zymotic register. At my request Dr. Cameron kindly permitted me to have a copy made of an entry from this volume, which will give a better idea of its scope than any attempted description (*see* Appendix VI.).

In what follows I may confine my remarks to the case of the infectious disease being one of small-pox. As soon as the medical officer learns of the case, (and in nearly every instance so far, this has been through the voluntary report of the medical attendant) the removal officer is sent with the ambulance to take the case to hospital. His visit is followed by that of the "van man," who removes all clothing and bedding to the disinfecting stations, a registrar being kept of all articles there disinfected. Lastly, all the inmates of the infected house are sent to the Sanatorium, where they are isolated for about a fortnight (*see* below).

The house is fumigated with sulphur by the same men who remove the articles, the fumigation being kept up (in small-pox cases) for about 24 hours. After the lapse of that time, the men proceed to strip off wall paper, wash the paint with a solution of corrosive sublimate, and limewash and whiten the ceilings, &c. The paper is kept off the walls for at least two weeks.

All the cases (of small-pox) have been removed to hospital, except one occurring in October 1892, which was not known to the authorities until reported by the registrar of deaths. (No. 36 in Table of Cases, Appendix IX.). He had not been attended professionally. In 1891 there were three cases not removed.

With regard to common lodging-houses, which contributed 13 cases in 1892, it is practically impossible to send their inmates away to the Sanatorium;* the plan adopted is to give the inmates free lodging for a fortnight, provided that they will come back every night, and no fresh lodgers are permitted to enter during this period. It is not deemed advisable to prevent them going about their work; and every night an inspector visits the lodging-house, calls the rolls, and ascertains if any other of the inmates have sickened. The lodging-house keeper is also enjoined to inform the authorities of any fresh cases of sickness in the house.

As a general principle all the public schools are furnished with a copy of the daily return of zymotic diseases compiled for the Medical Office of Health.

At the time of my visit (February 1893) Leeds may be said to have been in a state of transition as regards its provision for the isolation of small-pox (and fever) cases. The small-pox hospital at Stoney Croft, which up till May 1891 had received no cases of that disease since 1888, is really only constructed for 36 patients, and at one time, during 1891, there were this number in its wards, the total admitted in that year amounting to 44. When, however, in the latter half of 1892, cases of small-pox somewhat rapidly increased, the accommodation was strained, and a ward hitherto used for the isolation of persons from infected lanes had to be utilised for patients, and as many as 72 were at one time kept here, some convalescent cases being drafted to the "Sanitorium," Ivy House, York Road, where a temporary iron building had been erected for isolation purposes. Further accommodation was then imperatively needed, and at the time of my visit building operations had already commenced for a portion of two wards on a part of the Manston Estate, which had recently been acquired as a site for a new fever hospital.

Stoney Croft Hospital.

The small-pox hospital at Stoney Croft consists of a series of wooden buildings situated on high ground on the boundary line between the North and North East-wards. The site is an open one, the nearest buildings being to the south, about 500 yards distance, whilst on the N. and N. E., there is waste common land. Along the west side, however, runs a high wood, closely contiguous to the buildings, a 6-foot brick wall intervening. A large cemetery is situated on the other side of this road. The buildings consist of (*a*) two detached pavilions, containing each two wards, in each of which there were 12 beds, these pavilions being on either side of the ground; (*b*) a long shed parallel to the ward formerly used as a sanatorium, and now occupied by convalescents; (*c*) nurses' dormitory, connected by a curved way with one of the ward pavilions; (*d*) an administration block; and (*e*) a mortuary.

There is a resident matron and nursing staff; whilst the medical charge of the hospital devolves upon the resident medical officer of the fever hospital, Becket Road (Mr. A. E. Pearson, L.R.C.P., Ed. M.R.C.S. Eng.), who visits twice daily and at other times when required. The two buildings which are about half a mile apart are connected by telephone.

York Road Sanatorium.

The "Sanatorium" in York Road is an old brick mansion, now falling into decay, and it will shortly pass out of the hands of the Corporation. It has been chiefly utilised for the isolation of the inmates of infected houses in cases of scarlet fever, typhus fever* and of small-pox, and is under the medical supervision of the resident medical officer to the fever hospital. The following extracts from the annual "Report of the Borough Hospitals and Sanatorium" for 1891, by Mr. A. E. Pearson, will explain the use to which the building was put in that year:—

"From January 4th, 1891 to January 2nd, 1892, 358 "persons have been admitted from infected houses to "the Ivy House Sanatorium for isolation, as compared "with 172 of the previous report. From small-pox "houses, 163; from measles houses, 4; from scarlet "fever houses, 173; from typhus fever houses, 18. "The greatest number in the Sanatorium at one time "was 33, on September 15th, during the small-pox "outbreak. The daily average is four, and the average "stay of each small-pox infected person is 5·5 days, "measle infected person, 0·5 day; scarlet from infected "persons, one day, and typhus infected persons, 4·2 "days. . . . . During their term of quarantine at "Ivy House, eight persons were found to have small-"pox shortly after removal, and were at once trans-"ferred to hospital. One case was transferred to "hospital and isolated on suspicion. This case proved "to be chicken-pox."

Early in 1892, a wood and iron building was erected in the garden at the back of the house, containing eight rooms so arranged as to be divisible into smaller or larger dwellings, and furnished with bath room and offices. This was devoted to the isolation purposes, and the old building given up to convalescents from small-pox. It is intended to remove the temporary building to Manston, as soon as Ivy House is given up.

It may be added that one of the blocks at Stoney Rock, close to the small-pox wards has also been utilised for quarantine. During 1891, "from August 17th to "August 27th, 24 persons from small-pox cases "were admitted" to the Sanatorium. "These con-"sisted of the male members of families in which "houses small-pox cases have occurred, the York Road "Sanatorium being at the time full. The average stay "of each of these persons is 8·4 days. . . . One "case of small-pox was discovered" amongst these people and was removed to the wards. No cases are now quarantined at Stoney Rock which is entirely given over to small-pox patients.

The system of quarantining has received a notable extension in the erection of a series of buildings on the Manston Hall Estate; and it may be remarked that a larger proportion of these thus isolated are detained for the full period of 14 days than was hitherto the case. A description of the Sanatorium at Manston may be of interest, since it is the only example known to me of the devotion of some houses to this one object.

Manston estate.

The Manston Hall Estate, which was purchased by the Corporation in 1892, comprises 97 acres of well-wooded park, and is situated just outside the eastern city limits, the North-Eastern Railway (Leeds and Selby branch) bounding it on the south. A large

* Dr. Cameron told me that the first case was from a lodging-house of 30 inmates, who were all removed.

* *See* paper by Dr. Cameron, Trans. International Congress of Hygiene.

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mansion with garden, stabling, &c. stands in the park, and is at the present time utilised as a convalescent home for scarlet fever cases. No steps had then been taken to erect the permanent fever hospital on this site, which seems a very suitable one, but the Sanitary Committee were about to consider a report drawn up by a sub-committee upon various fever hospitals in the Kingdom, and containing memoranda of the requirements to be met. One of these requirements was the provision of accommodation for small-pox patients over and above that furnished by Stoney Park, where it is stated:—"The actual air accommodation is "equivalent to 36 beds, and there are four separate "rooms, so that each portion has a male and female "bed. Considerably more than 36 patients have been "taken in at a time, but the inconvenience arising "from overcrowding has been minimised by transferring the convalescent patients from the acute "wards as early as possible, as it is only in severe and "the early stages of slight cases that the full quantity "of air is absolutely demanded." The work of providing this additional accommodation had already commenced when I visited Manston with Dr. Cameron, on February 6th, and a month later he wrote me that the wooden hospital to accommodate 28 beds and 2,000 cubic feet per bed was completed. (*See* Pl. XXV., 1.)

Quarantine cottages at Manston.

The new Sanatoria or quarantine cottages occupy a plot of ground in the western half of the estate. They consist of iron and wood buildings, five in number (it is proposed to add a sixth for the caretaker's house, kitchen and laundry) symmetrically, placed at convenient distances apart, with the intervening paths and grass plots (see Pl. XXVI. for ground plan, and Pl. XXV., 2 and 3, for view of the cottages). Four of the blocks have two entrances, one at each extremity, whilst the fifth is provided with four entrances. The eight rooms into which each block is divided open into another, so that it is easy to convert the blocks into two (or more) cottages of various sizes. The caretaker and his wife at present resides in one of the cottages, and at the kitchen here the chief meals of all the inmates are cooked. The inmates are brought from the infected houses, and either call at the disinfecting station in Beckett Road, when they take a bath whilst their clothes are being disinfected, or on entering the Sanatorium have a bath and go to bed whilst their clothes are removed for disinfection. As far as possible they are detained in the Sanatorium for 14 days; and if they be engaged at work they (on application) receive compensation to the extent of about one-half their usual wages, since they get their maintenance free. During the whole fortnight they are kept within the grounds.

The caretaker reports every morning to the medical officer of health the number of persons in quarantine and the number of vacant rooms and beds in each cottage, his report being accompanied by a ground plan showing which cottages are occupied and which are vacant. The following is a copy of one such return:—

LEEDS CITY SANATORIUM, MANSTON.—DAILY RETURN OF ACCOMMODATION.

Thursday, March 16, 1893.

	Number of Cottages.											
	1	2	3	4	5	6	7	8	9	10	11	12
Rooms occupied - -	—	—	—	3	3	3	3	3	3	2	—	—
Beds in use - - -	—	—	—	6	7	7	6	6, 1 cot	7	4, 1 cot	—	—
Spare rooms - - -	—	—	—	0	0	0	0	0	0	1	—	—
Spare beds - - -	—	—	—	0	2 cots	0	0	1 cot	1, 1 cot	2	—	—

Total number of inmates 66 - - - - - - - - - 8 a.m.

W. B.

Small-pox in Leeds, 1891.

Monthly incidence of small-pox in 1891.

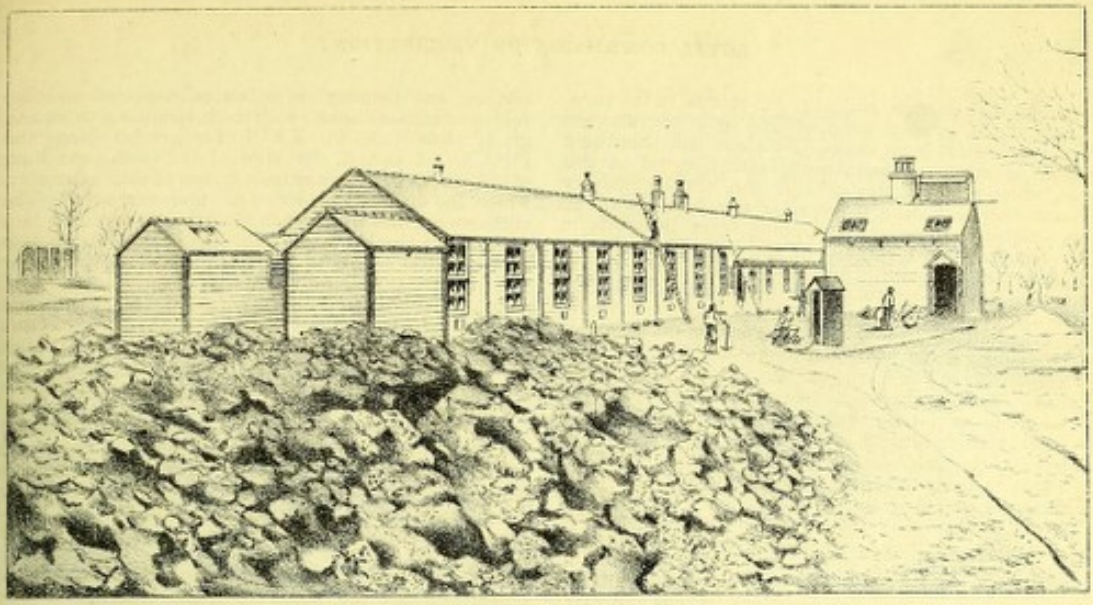
There had been no cases of small-pox in Leeds since 1888, when in the last week of April 1891 a case came to the knowledge of the authorities followed by another in the same house. In May there occurred one case, and in June one; but it was in August and September that the chief incidence fell. A very full and detailed account of the outbreak is given by Dr. Cameron in his Annual Report, from which I have attempted to condense the history given below, as well as the table in Appendix .

TABLE I.

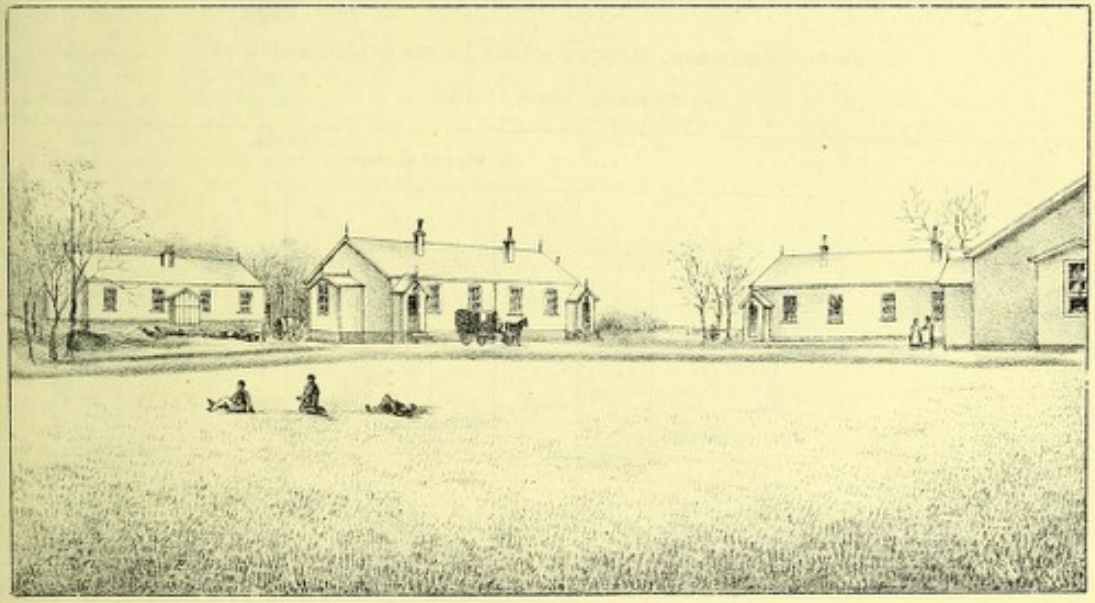
Small-pox, 1891.—*Monthly Incidence.*

	No. of Cases Heard of.	No. Attacked.
April - - - -	1	2
May - - - -	2	1
June - - - -	1	2
July - - - -	4	5
August - - - -	21	22
September - - -	17	14
October - - - -	—	—
November - - -	—	—
December - - -	1	1
	47	47

LEEDS, TEMPORARY SMALL POX HOSPITAL AT MANSTON 1893.



LEEDS CITY SANATORIUM, MANSTON. 1893. QUARANTINE COTTAGES.

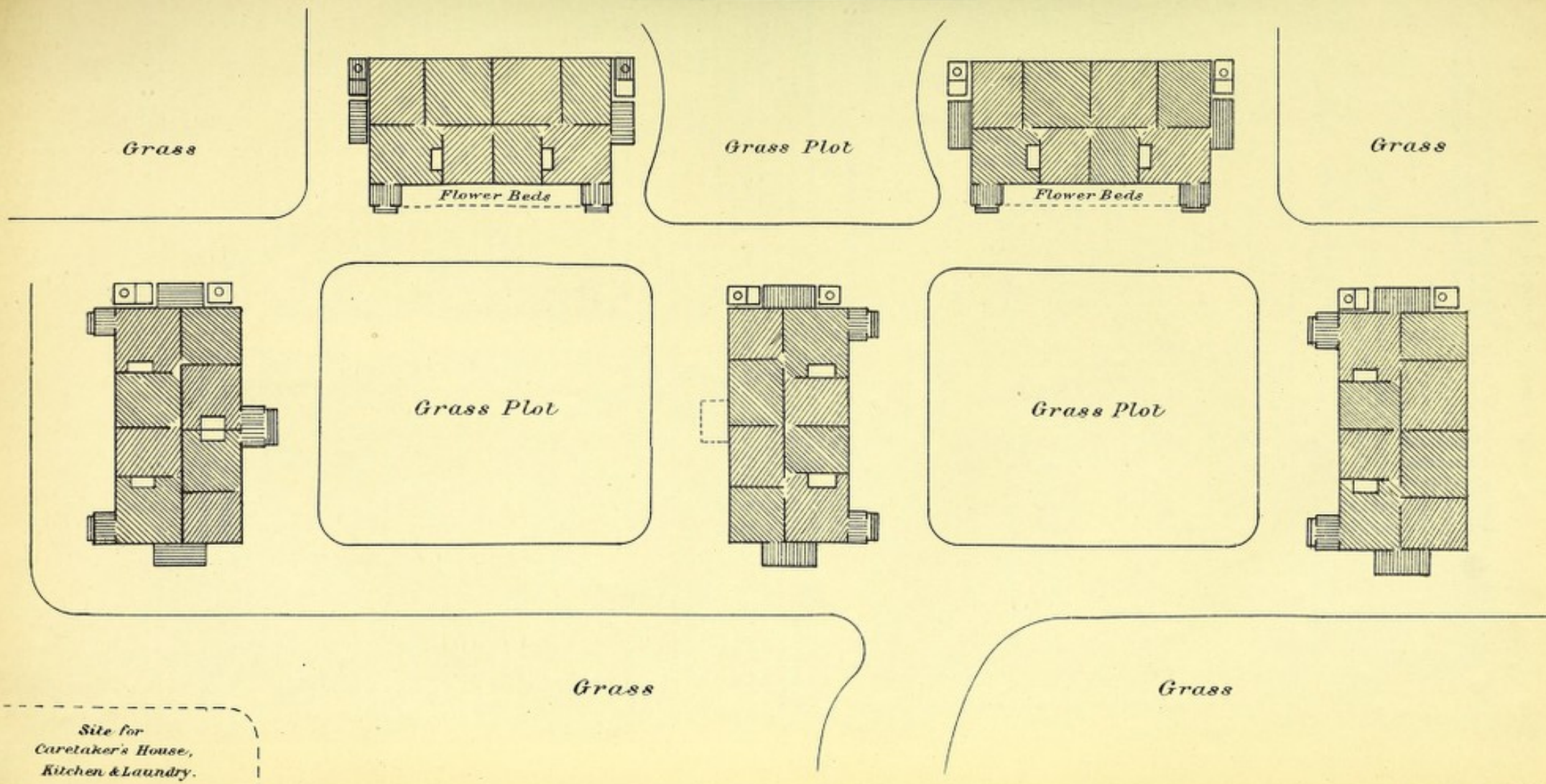




To face p. 138.

QUARANTINE COTTAGES
LEEDS CITY SANATORIUM

Scale 32nd of an Inch to a Foot



Wyman & Sons Ltd. Lith. 9019. 7.97.

The difference in numbers of these attacked with the disease in a given month and those coming to the knowledge of the authorities is in part accounted for by the absence of compulsory notification. It comes out more clearly when the weekly incidence is considered:—

TABLE II.

Leeds:—Small-pox. 1891.—Weekly Incidence.

Week of Year.	Ending.	Cases Arranged in the Weeks of Attack.*	—	Cases Arranged in the Weeks in which heard of by Medical Officer.	—
XV.	April 18	1.	1		
XVI.	„ 25			1.	1
XVII.	May 2	2.	1	2.	1
XVIII.	„ 9	3.	1		
XIX	„ 16			3.	1
—	—				
XXIV.	June 20	4.	1		
XXV.	„ 27	5.	1	4.	1
XXVI.	July 4			5.	1
XXVII.	„ 11	6.	1	6.	1
XXVIII.	„ 18	7.	1	7.	1
XXIX.	„ 25	8, 20.	2		
XXX.	Aug. 1	14, 25.	2	8.	1
XXXI.	„ 8	9, 12, 21, 22.	4		
XXXII.	„ 15	24, 26, 28.	3	9, 12, 14, 20, 21, 22.	6
XXXIII.	„ 22	10, 11, 15, 16, 17, 18, 19, 27, 30, 31.	10	10, 11, 15, 16, 17, 18, 19, 24, 25, 26, 27.	11
XXXIV.	„ 29	13, 23, 32, 34.	4	13, 23, 28, 30, 31.	5
XXXV.	Sept. 5	33, 35, 36, 46.	4	32, 33.	2
XXXVI.	„ 12	29, 37, 38, 39, 40, 41, 42.	7	34, 35, 36, 37, 38, 39, 40.	7
XXXVII.	„ 19	47.	1	29, 41, 42.	3
XXXVIII.	„ 26	43, 44, 45.	3		
XXXIX.	Oct. 3			43, 44, 45, 46, 47.	5
—	—				
XLIX.	Dec. 12	48.	1		
L.	„ 19			48.	1
			48		48

* The numerals refer to the cases in Table (Appendix VII.).

History of outbreak 1891.

The first case known to the authorities was that of a man (No. 1) who with his wife had recently come from Birmingham to Leeds to stop with a relation. They arrived at Leeds on March 25th, and the man first fell ill on April 14th. A searching inquiry was made in to his movements on the possible days of his infection about March 31st, and in particular a tailor's workshop was noticed where he had been on that day, but no clue could be gained as to the source of this case. The patient was not removed to hospital but isolated at home, all the other inmates being vaccinated including his wife (No. 2) who sickened with small-pox on the 7th day of her vaccination, which was said to be primary. "Her physician thought that the vac-" cination had modified the cause of her symptoms, " which were now milder than those of her husband." Dr. Cameron gives full details of the inquiries made in connection with these cases, from which it appears that the first patient was not seen by a medical man until the 17th, two days after the rash had appeared, and that he was in contact with other people on the previous and following days. It is noteworthy that Dr. Cameron states that it was to the courtesy of "the " medical man in attendance and to that of the " physician who he called in, that we are indebted for " any information about the case at all," an instance (of many) of prompt voluntary notification in a city where compulsory notification is not in force. On May 11th another case was "heard of," a young woman (No. 3) dwelling in the North East Ward, and working in a mill in Hunslet (South Ward), who fell ill on May 5th; and when rash appeared on the 8th she was removed to hospital on the 11th, and the three other inmates of the house taken to the Sanitoraum where they remained until the 25th. Inquiry at the mill and elsewhere threw no light on the origin of this case, nor were any subsequent cases traced to it.* The next case (No. 4) was removed from East Hunslet Ward on June 23rd, the day after the rash appeared; and the eight members of his family were taken to the Sanatorium for a fortnight. It seems highly probable, from the facts ascertained then and subsequently that this case was the origin of an outbreak in a family, two of whose members were subsequently admitted to hospital (Nos. 24 and 25); for a fellow worker of a brother of this patient (who was not himself attacked) had an illness "resembling " small-pox from July 1st to 22nd, that is to say, a " fortnight after June 17th or 18th, at which time" the brother of No. 4 was "going backwards and for-" wards between his brother and the works." No. 24 was found on August 17th to be suffering from a slight attack of small-pox, and was engaged in daily service in a family in a different ward from her home; she had sickened on the 9th, and the rash appeared on the 11th. She was sent to hospital on the 17th, and her brother (No. 25) still engaged in work was found to have been suffering from small-pox since July 27th, he was sent to hospital on August 18th. It came out that the father was attacked at the same time as this son, and their illnesses were regarded as chicken-pox; but, further, that the third son, aged 13, was the first to be taken ill, but so slightly as never to leave his work. This was the case mentioned above as engaged in the same works as No. 4. He was probably infected about June 17th or 18th through No. 4's brother, his illness occurred July 1st or 2nd; and "the most painful cir-" cumstance in regard to his family is that about a " fortnight after the third son was affected in the slight " manner already described, his mother was attacked " by a more serious illness." She was seized with violent pains in the back on July 11th, on the 15th she was "said to have had an eruption resembling nettle " rash," and she died on the 16th, her death being certified as due to "cerebral congestion, purpura " hæmorrhagica." Thus in this family of eight persons infected apparently through a third person, there seem to have been five attacked, one fatally, which with two of the others, was unrecognised at the time. Another case traceable to this is that of No. 33, a young woman removed on August 17th; she had been attacked on August 30th, rash on September 2nd (?), and was probably infected before the removal of this family, who inhabited the next house to her. Reverting to the earlier history, it is recorded that No. 5 was a collier

* Dr. Cameron writes: "It has to be remembered that all difficulties " in tracing the origin of outbreaks of this kind are greatly increased by " our not having adopted the general Act of 1889 for the compulsory " notification of infectious diseases. In these two instances we had " apparently prevented any further spread of the disease, but we were " still without any clue to its origin."

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employed at Gildersome near Batley; his case came to the knowledge of the authorities on July 4th, a few days after the rash had appeared. His wife (No. 6) and daughter (No. 7), who were sent to the Sanatorium on the day of his removal to hospital (July 4th), and both there re-vaccinated, developed the rash of small-pox on the 9th and 15th of July respectively. From the ample details given in the report it seems clear that the man was infected by a fellow worker whom he visited on June 15th, two days after the appearance of rash, then regarded as chicken-pox, following on influenza, and that this same patient visited the home of No. 6 on June 28th. The daughter (No. 7) was probably infected by her father (No. 5). The next case (No. 8) was that of a boy aged seven, who was unvaccinated and who died,—"the only fatal case* during the "outbreak." It is suggested that he may have been infected through some workmen from Batley,—where small-pox was then epidemic,—engaged in painting the house from July 15th to 27th; but if so the incubation period in his case would be unusually short, for he was attacked on July 24th. The rash appeared on the 28th, when he was removed to hospital. The case of a washerwoman (No. 9) in the south ward was reported to the district inspector on August 9th, and next day she was removed to hospital. On the 11th her mother and son, and on the 12th her brother were taken to the Sanatorium, where the mother (No. 10) and brother (No. 11) were both attacked on the 19th and developed the rash on the 21st, a fortnight from the day on which the eruption was noticed in the first case. On August 10th the case of a young man (No. 12) who had developed the rash was heard of near Wortley; his recently vaccinated infant sister (No. 13) who had been sent to the Sanatorium with eight other members of the family, was suspiciously ill on the 23rd, and was isolated at the hospital. Inquiry into his case led to the detention of two unrecognised cases (Nos. 20 and 21) in a house frequently frequented by No. 12. These patients had been ill from July 20th and August 5th respectively, but it was not certainly determined that they had had small-pox, nor were they isolated and their family sent to Sanatorium until August 22nd. Meanwhile, on August 15th there was reported the severe illness of a friend of the family of Nos. 20 and 21, whom he had constantly visited. This patient (No. 22), who was unvaccinated, fell ill on August 7th. On the 19th another severe case in a visitor to the same house became known (No. 26), whose illness commencing about August 11th was probably contracted from No. 21. Another member of this patient's family (No. 27) was attacked two days after removal to the Sanatorium. On August 11th a child (No. 14) in Roundhay Road was found to be recovering from small-pox, but owing to the parents' objection was not removed to hospital until on August 22, by which time five other members (Nos. 15 to 19) had developed the disease. All were then taken to hospital and the mother removed to the Sanatorium. The next cases (Nos. 28 and 29) are of interest first in the delay in removal of the first case owing to the inspector, who called to make inquiries, being informed that this was one of chicken-pox, and secondly because the husband (No. 29) of this patient, after being in quarantine for only five days returned home and to work, but developed the rash of small-pox on September 8th, and continued at work until the 11th, his case not being discovered until the 14th, when he was removed to the hospital, and the other members of his family returned to the Sanatorium. On September 12th he went to a football match and an inn with a man who developed small-pox rash on September 26th (No. 44 in Table). Two children (Nos. 30 and 31) one of whom, aged six months, had only been vaccinated 11 days previously, were removed from the house on August 26th, both had mild attacks. The mother, who had three good vaccination marks, and was re-vaccinated, was admitted into the hospital to nurse her infant. No. 32 was a member of the disinfecting staff, he had not been re-vaccinated. No. 34 was from an inn in Central Ward, who was removed on the day of eruption, and four members of the family isolated. Nos. 35 and 36 were removed together on September 9th, and two (Nos. 37 and 38) out of the eight members of family sent to Sanatorium fell ill, one on the 10th, the other on the 12th; both had been re-vaccinated on the 9th. "On the 9th," writes Dr. Cameron, "we also "heard first of a man† living in the next street to the "family where the mother had died of hæmorrhagic "small-pox. In fact, the two houses stood back to "back, and when the one from which we removed the "family on the 17th of August was the following day "stoved with brimstone, the smell of the burning sul-"phur penetrated into this house. The man was a "lodger, but we managed to persuade the landlady and "two fellow lodgers to go to the shelter. The air "communication between the houses does not, how-"ever, seem to have been the cause of the infection. "The people from the next house returned home on "the 22nd and 27th of August, and although as far as "possible, all movables had been stoved with steam, "it is quite possible that some articles containing the "infection may have been left behind, and certainly "the stoving of furniture by brimstone cannot be "regarded as a sufficient protection in a house where "small-pox had been in existence a month before we "knew anything about it. It seems, therefore, not "improbable that the infection may have been lurking "about this house. The time of the reopening of the "house corresponds closely with the date when this "man received his infection, and his landlady had "been in the habit of visiting at that house" (*loc. cit.*, p. 31). The husband of the next case (No. 40), made known on the 12th September, had visited public-houses in Morley, Dewsbury, and vicinity on August 25th and 26th, and may have conveyed infection to her. A child (No. 42) living in a house back-to-back with that in which these people lived developed small-pox on September 9th. No. 41 was a young woman whose father worked at the same place as No. 39; her family were removed to the Sanatorium for two days whilst the house was being disinfected. One case (No. 43) was heard of on the 27th, and one (No. 44) on the 28th, the latter obviously infected by No. 29, whose stay in quarantine had been so brief. The mother of No. 45 had visited an infected house 14 days before his rash appeared. On September 30th the cases of two children (Nos. 46 and 47), visitors at Holbeck from Batley Carr, were notified; the one had been attacked on September 1st, the other on the 14th, but "for the "sake of safety they were sent to the hospital" No other case occurred until the end of December (No. 48), this patient had been to Dinsbury and Batley on business.

Dr. Cameron concludes his report, of which the foregoing is, I fear, but an imperfect outline, in the remarks on the need for more sanatorium accommodation, which was met by the erection of the iron building in the grounds in York Road; and has since been so strongly extended in the Manston cottages. He appends a very detailed table, from which I have extracted a few particulars in the table in Appendix VII., and analyses the sanitary condition of the infected houses.

As regards quarantine, there were 123 persons, 59 males, 64 males, sent to the Sanatorium during this outbreak, nine of whom (three males, six females) subsequently developed small-pox, and were transferred to the hospital. The ages of these people were:—

TABLE III.

	Males.	Females.	Total.
Under 1 year	2	2	4
1-5 years	4	10	14
5-10 years	9	6	15
10-15 years	7	11	18
15-20 „	11	6	17
20-30 „	8	7	15
30-40 „	6	10	16
40-50 „	6	8	14
50-60 „	2	1	3
60-70 „	3	2	5
70 and over	1	1	2
	59	64	123

As to the duration of their stay in the Sanatorium, the following analysis has been made from the dates given in Dr. Cameron's table:—

* i.e., recognised as such. There is every probability that the case of "purpura," fatal on July 16th, was malignant small-pox.
† No. 39 in Table.

18 days in quarantine	-	-	1 person
16 ,, ,,	-	-	8 ,,
14 ,, ,,	-	-	17 ,,
13 ,, ,,	-	-	5 ,,
12 ,, ,,	-	-	10 ,,
11 ,, ,,	-	-	1 ,,
10 ,, ,,	-	-	13 ,,
9 ,, ,,	-	-	10 ,,
8 ,, ,,	-	-	7 ,,
7 ,, ,,	-	-	6 ,,
6 ,, ,,	-	-	1 ,,
5 ,, ,,	-	-	17 ,,
4 ,, ,,	-	-	4 ,,
3 ,, ,,	-	-	7 ,,
2 ,, ,,	-	-	14 ,,
1 ,, ,,	-	-	2 ,,
			123

Dr. Cameron points out in the text of his report that the accommodation did not permit of isolating these people for the full period of incubation in all cases. However, only one case (No. 29) developed small-pox after leaving quarantine—he had only been to me five days.

Of the nine cases which arose amongst those quarantined—

1 was attacked after		2 days'	stay.
2 were	,,	3	,,
1 was	,,	8	,,
2 were	,,	9	,,
1 was	,,	10	,,
1 ,,	,,	11	,,
1 ,,	,,	13*	,,

The age and sex incidence of the 48 cases of small-pox which came under notice in 1891 is as follows :—

TABLE IV.

——	Males.	Females.	Total.
Under 1 year - - -	1	1	2
1-5 years - - - -	1	2	3
5-10 years - - - -	3	1	4
10-15 years - - - -	4	3	7
15-20 ,, - - - -	4	2	6
20-30 ,, - - - -	6	8	14
30-40 ,, - - -	3	3	6
40-50 ,, - - - -	4	1	5
50-60 ,, - - - -	—	—	—
60-70 ,, - - - -	—	1	1
	26	22	48

There was one fatal case, a male, aged seven years. In the Appendix (VIII.) I have transcribed the vaccination statistics of the cases admitted into hospital from Mr. Pearson's Annual Report of that institution.

§ 3. *Small-pox in Leeds*, 1892-93.

Isolated cases of small-pox occurred in January to April, but it was not until July that the disease again recurred to any extent, and then only in intermittent outbursts. From the middle of September onwards, however, cases have occurred every week, the numbers known to the authorities reaching to as many as 17 in the week on more than one occasion. During the whole year, so far as is known, there were 127 cases, of which number 104 were heard of in the last quarter of the year; whilst in the five weeks of 1893, over which this inquiry extends, there have been 93. There is included in this number of 200 cases one case of an infant registered as a small-pox death, but which can only be so reckoned with great reserve; its mother was suffering from the disease when this child was born prematurely, and died on the day after its birth. (*See* table, Appendix IX.)

* No. 13 in table (actually kept for 16 days, a doubtful case).

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Monthly incidence of small-pox in 1892-93.

TABLE V.

Weekly Incidence.

——	Attacked.	Deaths.	Reported or heard of.	Deaths.	——
January 1892 -	1	—	1	—	
February ,, -	1	—	1	—	
March ,, -	1	—	1	—	
April ,, -	3*	1*	3*	1*	* One a case of infant one day old, registered as death from Small-pox.
May ,, -	—	—	—	—	
June ,, -	—	—	—	—	
July ,, -	6	—	6	—	
August ,, -	10	—	10	—	
September ,, -	7	—	2	—	
October ,, -	13	2	11	1	
November ,, -	50	2	53†	3†	† One, a fatal case, occurring in October, unreported, discovered after death.
December ,, -	50	4	39	3	
January 1893 -	57	2	65	2	
February (to 4th) -	1	—	8	1	
	200	10	200	11	

TABLE VI.

Small-pox, 1892-93.—*Monthly Incidence.*

Weekly incidence.

Week of Year.	Ending.	Numbers Attacked.	Deaths.	Number Heard of.	Deaths.
I.	Jan. 9 - -	1	—	1	—
V.	Feb. 6 - -	1	—	—	—
VI.	,, 13 - -	—	—	1	—
XI.	March 19 -	1	—	—	—
XII.	,, 26 -	—	—	1	—
XV.	April 16 -	2	1	2*	1
XVI.	,, 23 -	1	—	1	—
XXVII.	July 9 - -	1	—	1	—
XXIX.	,, 23 - -	5	—	5	—
XXXI.	Aug. 6 - -	1	—	—	—
XXXII.	,, 13 - -	6	—	2	—
XXXIII.	,, 20 - -	2	—	7	—
XXXIV.	,, 27 - -	1	—	1	—
XXXVIII.	Sept. 24 -	2	—	1	—
XXXIX.	Oct. 1 - -	6	1	2	—
XL.	,, 8 - -	2	—	5	1
XLI.	,, 15 - -	1	—	2	—
XLII.	,, 22 - -	5	1	1	—
XLIII.	,, 29 - -	2	—	2	—
XLIV.	Nov. 5 - -	14	—	6†	1†
XLV.	,, 12 -	13	2	15	2
XLVI.	,, 19 -	16	—	17	—
XLVII.	,, 26 -	7	—	9	—
XLVIII.	Dec. 3 - -	4	—	9	—
XLIX.	,, 10 - -	12	3	7	2
L.	,, 17 - -	6	—	9	1
LI.	,, 24 - -	11	—	6	—
LII.	,, 31 - -	19	1	14	—
1893.					
I.	Jan. 7 - -	7	—	14	1
II.	,, 14 - -	12	—	10	—
III.	,, 21 - -	19	—	17	—
IV.	,, 28 - -	13	2	14	1
V.	Feb. 4 - -	7	—	18	1
		200	11	200	11

* Returned as small-pox death. † Unreported, fatal case included.

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Earlier history of outbreak.

The following account of the earlier cases was furnished by Dr. Cameron in a Report to the Sanitary Committee, dated September 12th, 1892:—

"Sporadic cases of small-pox were reported, one in January, one in February, one in March, and one in April, all apparently introduced into the borough from outside. The January patient contracted the disease at Birstall, where he had been staying in an infected house. The February case was that of a tramp from Ardsley. The March one was that of a Leeds man, who had apparently received the infection at a football match held in the borough, but largely attended by persons from outside.

"The April patient was the wife of a carman travelling in the Dewsbury and Batley district, who had apparently carried the infection of the disease home with him. The wife miscarried, the premature child had no marks of small-pox, and died within 24 hours. The child's death was returned as due to small-pox.

"Everyone of these cases was isolated, the members of each family separated from the rest of the community, and no second case arose from any of them. From April to July, no further case in Leeds came to our knowledge.

"On the 8th of July, a tramp who had been staying with his sister at Greetland, in a house in which there was small-pox, and who had arrived in Leeds the night before, applied for medical attendance, and was certified to us as probably suffering from small-pox. He had, however, given the wrong address, and although Mr. Swallow, Dr. Wilson, and myself, spent a great part of the afternoon in searching for him, our quest was vain. The next day the same doctor was sent for to the place where the man was staying, a common lodging-house off Meadow Lane. He at once gave us the correct address, and the patient was immediately removed. The rooms and bedding were disinfected, the latter by steam. The other inmates of the house were induced to go to the Sanatorium and have a bath, while their clothes were being disinfected by steam, and the inspector of the district for the next fortnight made daily visits to the lodging-house.

"On the 20th of July one of the inmates of this lodging-house, who had applied for medical help and been admitted to the Leeds Union Infirmary, was sent into our hospital. The following day we removed two others from the lodging-house, and a fourth and fifth on the 22nd and 23rd of July. Four of these five patients had slept in the same room with the tramp first mentioned; the fifth slept in the room below him. It is an interesting point that the four who slept in the same room with him, all slept on the side of the room remote from the windows. No other inmate of this lodging-house developed the disease. The cases mentioned had been removed to hospital in an early stage. The experiment, however, of leaving the inmates of the lodging-house to incubate the disease, as it were, in public, could only be regarded as a dangerous one.

"On the 11th, 13th, and 15th of August, cases of small-pox appeared in three separate streets in another quarter of the town. The patients were removed, the inmates isolated, and their houses and clothing disinfected. It is probable that the first of these cases contracted the disease at market, but exactly how could not be traced. The second probable received the infection at a house where she charred, the master of the house having been in contact with small-pox outside the town, and the disease was thus probably conveyed to our patient by a third party who did not himself suffer from it. The third case developed the eruption on the 15th day from a journey to Scarborough, she having been in contact in the train with persons from neighbouring towns. From none of these did fresh cases arise.

"The next case was in the house of a woman who received visitors. He was removed and the rest of the family isolated. One of the children, a boy of six, who had never been vaccinated, developed the disease in the Sanatorium, having apparently received the infection four days before we vaccinated him, as we had done on his removal to the shelter, our practice being to vaccinate or re-vaccinate all persons there isolated.

"On the 17th, two cases were reported in a lodging-house off York Street. On visiting we were told that a fortnight earlier a case of 'chicken-pox' had occurred in the house. We thought it necessary in this case not only to take the occupants of the immediate building, but the whole of those living in the other portions of the lodging-house to our shelter. They were all isolated to the number of 29 persons, for a fortnight in the Sanatorium, and no fresh cases have arisen amongst them up to the present time.

"Solitary cases occurred in different streets, two on the 18th and one on the 19th. It was thought desirable in the outbreak of the August cases to house-to-house visitation made of every district in which small-pox had occurred, for it seemed likely that the infection of some of these cases might have been close to others which had been concealed from us. Accordingly, between the 15th and 19th inclusive, the inspectors visited 2,024 houses round the seven houses in which cases occurred, and the last case named, the one removed on the 19th of August, was the only case of small-pox found. It was at once isolated, and the rest of the family disinfected After the lapse of a fortnight the same houses to the number of 2,023 were revisited, but no case of small-pox was found in any of them."

I regret that I am unable to give any account of the progress of the epidemic since last September. My stay was too brief to permit me to enter into the subject, at length; but Dr. Cameron was kind enough to give me a few particulars of some of its salient features. One of the most instructive groups of cases was the following:—Early in November Dr. Cameron was asked by a medical man to see a suspected case in E———. Buildings. He found there a child in about the 10th day of the disease, and on inquiry learnt that its mother had been ill two weeks before. She was attacked about October 3, and had a rash on the 8th; and may have been infected through her husband, a boot-rivetter at Bramley, visiting at Batley. She was attended by a medical man, and on the 22nd her daughter aged 6 years fell ill, developing a rash on the 27th. This was the case which Dr. C. saw, and at his request the child was removed to hospital, the father and another child being sent to the Sanatorium on November 11. It then was discovered that a next door neighbour, Mrs. F., who had visited the house, had also passed through an illness, commencing on October 22, and characterised by a rash which appeared on the 25th. This woman's two children, aged 2 years and 10 years respectively, both being unvaccinated were attacked on November 5 and November 7, and the father, also unvaccinated, on November 8th. These four patients were removed to hospital on the 12th, the father and one of the children dying from the disease on the 14th. (Cases 53 to 56 in Table, Appendix). It should be mentioned that Mrs. F——, when attacked, was a mild and unrecognised one, had "two good" vaccination marks; but the three unvaccinated members of the family who were inspected by her had respectively hæmorrhagic (fatal), confluent (fatal), and semi-confluent attacks. There was one other inmate of the house, a female 54 years of age, who was removed to the Sanatorium; she was not attacked. About the same time information was received of the death of a man (No. 36 in Table), after an illness during which he had not been attended by a medical man; but the surgeon who saw the body after death ascribed it to small-pox. This man, it was ascertained, had been taken ill on October 22nd, and he died on the 30th. Three other inmates of the same house (Nos. 37, 38, 39,) were attacked on November 2 and 3; in one of these the rash appeared on the 4th, the day on which the house was visited by the Sanitary Authorities, and this case was sent to hospital, whilst the 7 remaining inmates were conveyed to the Sanatorium. On the 5th the rash appeared in the two other cases and they were transferred to hospital.

There is no reason to believe that the small-pox hospital has been the cause of infection in its vicinity. The spot maps kindly furnished by Dr. Cameron, although showing many cases in this part of the city are not conclusive on the point; and as Dr. Cameron points out, more cases came from lodging-houses in this part than elsewhere.

It will be seen from the table that a certain number of cases were removed from lodging-houses and Salvation Army Barracks, and a few from workhouses, in all there have been 23 (20 males, 3 females), coming from these sources.

TABLE VII.

Small-Pox 1892–93.—*Age and Sex Incidence.*

—	Males.			Females.			Both Sexes.			Total.
	Recovered.	Died.	Remaining in Hospital.	Recovered.	Died.	Remaining in Hospital.	R.	D	H.	
1 year - -	—	—	—	2	2	—	2	2	—	4
5 „ - -	1	1	1	—	—	—	1	1	1	3
10 „ - -	4	—	—	4	—	—	8	—	—	8
15 „ - -	4	—	—	6	—	1	10	—	1	11
20 „ - -	5	—	2	15	—	3	20	—	5	25
30 „ - -	34	3	7	32	—	4	66	3	11	80
40 „ - -	30	1	3	11	2	1	41	3	4	48
50 „ - -	9	—	2	1	—	—	10	—	2	12
60 „ - -	4	1	—	1	—	—	5	1	—	6
70 „ - -	2	1	—	—	—	—	2	1	—	3
	93	7	15	72	4	9	165	11	24	200

It will be seen from the above table that of the cases returned as small-pox 165 had been discharged from hospital when the return was completed (*i.e.*, almost three weeks after my visit all, Mr. Pearson kindly supplying the details), and that 11 had died, giving a mortality of 6·1, but as this includes the case of the infant above mentioned, it may be more correct to enumerate only 10 deaths, a mortality of 5·6. Moreover, all of the cases which were still in the hospital were then practically convalescent, so that the actual mortality would be 10 deaths in 199 cases, practically 5 per cent. It will also be seen that of the whole number (200) only 15 were below 10 years of age, 106 were aged from 10 years to 30, and 69 were aged 30 years and upwards, the mortality rates for each of these persons being:

Under 10 years,* 15 cases, 3 deaths = 20 per cent.
10 to 30 „ 116 „ 3 „ = 2·5 „
30 years, over 69 „ 5 „ = 7·2 „

the most striking difference between the relative mortality of the two sexes being seen in the three fatal cases out of 53 males at the ages 10 to 30, and the 61 females who all recovered; whilst of those beyond 30 years, there were 53 males with three deaths (5·6 per cent.), and only 16 females with two deaths (12·5 per cent.).

The analysis of the type of the attack given in the Table VIII. is based on the hospital records kept by Mr. Pearson. From it will be seen that on the whole number 34 cases are characterised as confluent (including one hæmorrhagic"), 27 as semi-confluent, 88 as discrete, 49 as mild attacks, whilst in two there is no record of the type. These may be grouped in age-periods as—

—	Confluent.	Semi-confluent.	Discrete.	Mild.	Not stated.
Under 10 years - -	7	1	3	3	1
10 to 30 years - -	15	10	56	35	—
20 years and upwards -	12	16	29	11	

which shows that the youngest group suffered more than the rest, more than one-half having severe (confluent and semi-confluent cases); and that those aged 30 years and upwards come next in point of proportionate severity, two-fifths being severe cases), whilst in the intermediate (and largest) group slightly more than one-fourth fell under this category.

Vaccination conditions of small-pox cases

By means of Table IX. we can contrast the same cases in respect to the condition of the patient as regards vaccination. Of the whole number one-tenth, or 20, are reported as having been unvaccinated; 3 were attacked with the disease whilst undergoing vaccination; 17 were said to have been vaccinated in infancy, but presented no marks,—an unusually high proportion for this class; 154 were vaccinated (or

TABLE VIII.

Leeds:—Small-pox Cases, 1892–93.—*Type of Attack.*

—	Confluent.			Semi-confluent.			Discrete.			Mild.			Type not stated.			Total.			—
	Recovered.	Died.	Remaining in Hospital.	Recovered.	Died.	Remaining in Hospital.	Recovered.	Died.	Remaining in Hospital.	Recovered.	Died.	Remaining in Hospital.	Recovered.	Died.	Remaining in Hospital.	Recovered.	Died.	Remaining in Hospital.	
Under 1 year - -	1	1	—	—	—	—	—	—	—	1	—	—	—	1	—	2	2	—	4
1 to 5 years - -	—	1	1	1	—	—	—	—	—	—	—	—	—	—	—	1	1	1	3
5 to 10 years - -	3	—	—	—	—	—	3	—	—	2	—	—	—	—	—	8	—	—	8
10 to 15 years - -	1	—	—	—	—	—	3	—	1	6	—	—	—	—	—	10	—	1	11
15 to 20 years - -	3	—	1	—	—	—	8	—	3	9	—	1	—	—	—	20	—	5	25

* More correctly, 4 cases 2 deaths. = 14·3 per cent.

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TABLE VIII.—*continued.*

	Confluent.			Semi-confluent.			Discrete.			Mild.			Type not stated.			Total.			
	Recovered.	Died.	Remaining in Hospital.	Recovered.	Died.	Remaining in Hospital.	Recovered.	Died.	Remaining in Hospital.	Recovered.	Died.	Remaining in Hospital.	Recovered.	Died.	Remaining in Hospital.	Recovered.	Died.	Remaining in Hospital.	
20 to 30 years	5	3	2	9	—	1	34	—	7	18	—	1	—	—	—	66	3	11	80
30 to 40 years	6	3	—	8	—	1	18	—	3	9	—	—	—	—	—	41	3	4	48
40 to 50 years	2	—	—	4	—	1	4	—	1	—	—	—	—	—	—	10	—	2	12
50 to 60 years	1	—	—	2	—	—	2	—	—	—	—	—	—	1	—	5	1	—	6
60 to 0 years	—	—	—	—	—	—	—	1	—	2	—	—	—	—	—	2	1	—	3
Total	22	8	4	24	—	3	72	1	15	47	—	2	—	2	—	165	11	24	200

TABLE IX.

Leeds:—Small-pox Cases, 1892-93.—*Vaccination Statistics.*

	Vaccinated.			No Information as to Vaccination.			Vaccination alleged, but no Evidence.			"Under" Vaccination.			Unvaccinated.			Total.			
	Recovered.	Died.	Remaining in Hospital.	Recovered.	Died.	Remaining in Hospital.	Recovered.	Died.	Remaining in Hospital.	Recovered.	Died.	Remaining in Hospital.	Recovered.	Died.	Remaining in Hospital.	Recovered.	Died.	Remaining in Hospital.	
Under 1 year	—	—	—	—	—	—	—	—	—	1	—	—	1	2	—	2	2	—	4
1 to 5 years	—	—	—	—	—	—	—	—	—	—	—	—	1	1	1	1	1	1	3
5 to 10 years	4	—	—	—	—	—	1	—	—	1	—	—	2	—	—	8	—	—	8
10 to 15 years	8	—	1	—	—	—	1	—	—	—	—	—	1	—	—	10	—	1	11
15 to 20 years	16	—	5	1	—	—	2	—	—	1	—	—	—	—	—	20	—	5	25
20 to 30 years	54	—	9	3	—	—	5	1	2	—	—	—	4	2	—	66	3	11	80
30 to 40 years	36	2	4	—	—	—	3	1	—	—	—	—	2	—	—	41	3	4	48
40 to 50 years	7	—	2	—	—	—	2	—	—	—	—	—	1	—	—	10	—	2	12
50 to 60 years	5	—	—	—	—	—	—	—	—	—	—	—	—	1	—	5	1	—	6
60 to 70 years	1	—	—	—	—	—	1	—	—	—	—	—	—	1	—	2	1	—	3
Total	131	2	21	4	—	—	15	2	2	3	—	—	12	7	1	165	11	24	200

nearly four-fifths); and in four cases there was no information on the point. As regards the relative mortality of these groups, that of the unvaccinated was 35 (more correctly 31?) per cent.; of the "alleged vaccination cases" 10·5 per cent.; of the vaccinated 1·3 per cent. (including those entered as "remaining in hospital") among the recoveries. Once more distributing them in age periods—

TABLE X.

	Under 10 Years.		10–30 Years.		30 Years and Over.	
Vaccinated	4 cases.	0 deaths	93 cases.	0 deaths	51 cases.	2 deaths.
No information	-	-	4 cases.	0 deaths	-	-
Alleged vaccination	1 case.	0 deaths	11 cases.	1 death	7 cases.	1 death.
"Under" vaccination	2 cases.	0 deaths	1 case.	0 death	-	-
Unvaccinated	8 cases.	3 deaths	7 cases.	2 deaths	5 cases.	2 deaths.

The two fatal "vaccinated cases" occurred therefore in individuals of middle life.

In Appendix X. I have further analysed Mr. Pearson's record by giving the relative numbers at each period of life of those having "good," "fair," and "poor" marks (and the number of them) respectively, grouping them according to the type of the attack of small-pox from which they suffered. This analysis may be taken in conjunction with the more condensed summary in the following Table (XI.). Suffice it here to say that of the 34 confluent cases 13 were in vaccinated subjects (none below 15 years of age), 13 among the unvaccinated (7 below 15 years of age), and 8 amongst those who were said to have been vaccinated but showed no evidence of it. Or taking the *confluent and semi-confluent types* together—

32 were in vaccinated* persons -
- 11 with "good" marks.
- 4 with "fair" marks.
- 16 with "poor" marks.
- 1 condition of marks not stated.

13 were in persons said to have been vaccinated, but with no marks.

15 were in unvaccinated persons.

And of the "*discrete*" *and* "*mild*" *cases*—

122 were in vaccinated* persons -
- 53 with good marks.
- 25 with fair marks.
- 42 with poor marks.
- 2 not stated.

6 in persons said to have been vaccinated, but with no marks.

3 in persons undergoing primary vaccination at the time.

3 in unvaccinated persons.

The type of small-pox is unrecorded in two unvaccinated subjects, one being the infant so often referred to, whose death from small-pox is at least equivocal.

TABLE XI.

Cases of Small-pox.—Type and Vaccination.

		Below 1 Year.	1 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	Total.
Vaccinated	Confluent	—	—	—	—	2	3	6	1	1	—	13
	Semi-confluent	—	—	—	—	—	6	8	3	2	—	19
	Discrete	—	—	3	3	10	36	20	5	2	—	79
	Mild	—	—	1	6	9	18	8	—	—	1	45
No information as to vaccination	Confluent	—	—	—	—	—	—	—	—	—	—	—
	Semi-confluent	—	—	—	—	—	1	—	—	—	—	1
	Discrete	—	—	—	—	1	2	—	—	—	—	3
	Mild	—	—	—	—	—	—	—	—	—	—	—
Alleged vaccination, but no marks	Confluent	—	—	1	—	2	3	2	—	—	—	8
	Semi confluent	—	—	—	—	—	2	1	2	—	—	5
	Discrete	—	—	—	1	—	2	—	—	—	—	3
	Mild	—	—	—	—	—	1	1	—	—	1	3
"Under" vaccination	Mild	1	—	1	—	1	—	—	—	—	—	3
Unvaccinated	Confluent	2	2	2	1	—	4	1	1	—	—	13
	Semi-confluent	—	1	—	—	—	1	—	—	—	—	2
	Discrete	—	—	—	—	—	1	1	—	—	2	3
	Mild	—	—	—	—	—	—	—	—	—	—	—
	Types not stated	1	—	—	—	—	—	—	—	1	—	2
Total		4	3	8	11	25	80	48	12	6	3	200

Finally, as regard the measures adopted during this outbreak, it is noteworthy that everyone of the cases known to the authorities has been removed to hospital, the only case not so removed being concealed until after the man had died. It will have been observed also that in some instances the existence of small-pox in a household has not been made known until the occurrence of subsequent cases has revealed the true nature of the illness from which the first to be attacked had suffered. This may happen without any wilful suppression, from the extreme difficulty there sometimes is in recognising the mildest form of the disease.

Measures adopted by authorities.

* In one other there was no information as to vaccination.

* In three others no information as to vaccination.

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It would not be fair therefore to attribute the lack of early information to the absence of compulsory notification, for these "mixed cases" occur even under the best system of prompt notification. They are inherent to the nature of the disease, and form one of the chief obstacles to its suppression by mere isolation. Nevertheless the lack of compulsory notification must hamper the sanitary authority and add to the labours of the inspecting staff. Dr. Cameron informed me that whenever a case is reported, a member of the staff is told off to visit the houses in the vicinity in order to detect concealed cases. In his report on the 1892 cases, he mentioned that 2,042 house were visited in connexion with a case in August, with the result that one fresh case was revealed; and the total number of such domiciliary visits made during the last quarter of the year amounted, he informed me, to 10,599.

Quarantine of inmates of infected cases.

Perhaps the chief feature of the steps taken in Leeds to contend with small-pox is the extent to which the method of quarantining is now being carried out. I am not in a position to give the details of the plan in operation during the present year, during which the cottages at Manston have been available; but I am enabled, through the courtesy of Dr. Cameron who allowed me to enter the facts from the register, to give the figures for 1892.

In connexion with the 129 cases which arose in 1892,* steps were taken to remove to the Sanatorium the members of families with which 106 of these patients were connected, 22 of which developed the disease in the Sanatorium. Of the rest 12 came from common lodging-houses or shelters, 8 were transferred to hospital from workhouses, and only three from private dwellings. The total number of persons sent to the Sanatorium in connexion with the 84 cases amounted to 360, 177 males and 183 females, and 19 of them developed small-pox in that institution, 7 males, 12 females. These people came from 76 different houses, which may be thus grouped:—

55 houses yielded	1 case	each, *i.e.*,	55	cases;			206	quarantined.
15	,,	2 cases	,,	,,	30	,, (10 after admission to Sanatorium);	109	,,
3	,,	3	,,	,,	9	,, (4 ,, ,,);	22	,,
3	,,	4	,,	,,	12	,, (5 ,, ,,);	23	,,
76					106	19	360	,,

TABLE XII.

Admissions to Sanatorium.—Sex and Age.

	Males.		Females.	
	Total admitted.	Attacked after.	Total admitted.	Attacked after.
Under 1 year	7	—	8	1
1—15 ,,	20	—	18	—
5—10 ,,	21	1	29	1
10—15 ,,	21	1	22	1
15—20 ,,	21	1	20	4
20—30 ,,	29	1	30	1
30—40 ,,	22	2	26	3
40—50 ,,	17	—	12	1
50—60 ,,	12	1	10	—
60—70 ,,	5	—	6	—
70 and over	2	—	2	—
	177	7	183	12

Of the 19 cases that arose in the Sanatorium, the small-pox rash appeared, and they were transferred to the hospital after—

1 day	in Sanatorium	-	4 cases.
4 days	,,	-	1 ,,
7 ,,	,,	-	2 ,,
8 ,,	,,	-	1 ,,
9 ,,	,,	-	1 ,,
10 ,,	,,	-	5 ,,
11 ,,	,,	-	1 ,,
12 ,,	,,	-	1 ,,
13 ,,	,,	-	2 ,,
16 ,,	,,	-	1 ,,
			19

I am not able to give full statistics of the duration of the stay of persons in the Sanatorium, but I have collated the dates in the register referring to 275 out of the 360 persons so dealt with. Of this number there remained from—

1 to 5	days	-	10
6 ,, 10	,,	-	21
11 ,, 15	,,	-	173
16 ,, 20	,,	-	43
†21 ,, 30	,,	-	28

Re-vaccination is offered to those admitted into the Sanatorium, and has been performed on a large number. I may add here that on the occurrence of the outbreak the hospital nursing staff and employés were all re-vaccinated, as well as many of the inspectors.‡ One of the latter, who had not been re-vaccinated, was attacked with small-pox. As a rule the inspectors do not visit the house until it has been disinfected. Two of the men employed in stripping houses after its disinfection by sulphur fumigation, were attacked with small-pox, but it is not clear that they were infected at the houses. The medical officer then gave directions that this work should only be done by those who had been re-vaccinated.

No steps had been taken to facilitate gratuitous public re-vaccination up to the time of my visit.

CONCLUSIONS.

1. The absence of compulsory notification is a feature that distinguishes the sanitary government of Leeds. It entails additional labour and anxiety on the part of the health officers; and although few (if any) cases of small-pox have escaped notice, there is often unavoidable delay in taking action for isolation, disinfection, &c.

2. The sanitary organisation is of a high order, and the measures for dealing with small-pox adequate and efficient.

3. The thorough manner in which the quarantine system is carried out deserves special commendation. Its value would be enhanced if supplemented by notification.

I desire to thank Dr. Spottiswoode Cameron and Mr. Pearson for their cordial assistance during this inquiry.

London, May 1, 1893. S. C.

* Two cases infected in December developed the disease in the Sanatorium in January.

† I cannot vouch for the precise accuracy of these figures, as there may have been some errors in transcription. They are, I believe, in the the main correct, and they show that the majority are detained for two weeks and over.

‡ At the time of my visit all had been re-vaccinated.

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APPENDIX I.

LEEDS:—POPULATION, MORTALITY, AND DEATH RATES IN THE MUNICIPAL WARDS FOR THE YEAR 1891.

[*Extracted from Medical Officer's Annual Report for* 1891, *p.* 87.]

Municipal Wards.	Census Population, 1891.	Total Deaths.	Death Rate.
Central - - -	23,009	479	20·8
North - - -	26,592	565	21·2
North-East - - -	24,190	741	30·7
East - - - -	25,585	830	32·4
South - - - -	17,232	504	29·3
East Hunslet - - -	25,386	582	22·8
West Hunslet - - -	23,794	491	20·6
Holbeck - - -	21,564	489	22·7
Mill Hill - - -	9,212	206	22·5
West - - - -	24,668	621	25·2
North-West - - -	28,363	513	18·0
Brunswick - - -	22,750	400	17·6
New Worthy - - -	19,410	449	23·1
Armley and Wortley - -	26,436	550	20·7
Bramley - - -	18,373	338	18·4
Headingley - - -	30,893	527	16·9
Outsiders - - -	—	144	—
Totals (R.G.) - - -	367,506	8,429	22·91

APPENDIX II.

SANITARY INSPECTOR'S NOTE BOOKS.

The convenient little note books furnished to each ward inspector, for the record of his observations, are provided with a series of headings under which he makes his report. I append below the slip from the book used sor house-inspection, and that used for cases of infectious disease. The "contractions" are those recommended to be employed in note-taking.

HOUSE-TO-HOUSE QUERIES.

COLS.

1. Date of previous inspection:
2 & 3. Street | Position in Street, and aspect:
4. Occupier:
5. Owner's Name and Address:
6, 7, & 8. Trade in house | No. of rooms | Kind of rooms, cleanliness of | Area of ground floor:
9 & 10. { No. of inmates | Description of ditto: / M. & F. | Under 5: 5 to 15; 15 upwards.
11. Water Supply:
12 & 13. No. rooms in which windows open | Rooms with chimney | Ditto with chimney open:
14 & 15. Is house back-to-back? | Is there a through draught?
18 & 19. W.C.¹ Sink:
20 & 21. Basement drains | Other drains (Bath, lav., &c.):
22, 23, & 24. Main Sewer | Depth, ft. | Size, in. | Distance, yd. | State if pipe, brick, stone; shape:
25, 26, & 27. Yard drains | Fall pipes | Eaves spouting | Distance of street gully, in yds.:
28 & 29. Damp walls and cause | Foul smells:
30. Privy | Kind | Condition | Distance, yds. | No. of families using it:
31. Ashpit | Same details: | | | |
32. Remarks:
33. References:

CONTRACTIONS.

D. means drain of house (as sink pipe, cellar drain, &c.), connected directly to street drain or sewer.
T. means that an S. or syphon trap is interposed.
C. means that the house drain is *cut off*, and opens over a trapped gulley or grid.
T. C. same with syphon trap inside.
T. V. means that the trap is efficiently ventilated.
S. means that the fall-pipes or *downspouts* go directly into the drains.
S. C. that the spouts are disconnected from the drains.
F. V. means that the W.C. soil pipe goes *full* size above the eaves.
V. 1½ means that a ventilating pipe of 1½ inches diameter, goes from the trap of soil-pipe above the eaves, and similarly for other sizes.

CASE OF INFECTIOUS DISEASE.

Address: 1.
Occupier's Name: Owner's do. 2.
Patient's Name: Age: Sex: 3.
Workplace or School (standard) 4.
Whether removed. Date of removal. 5.
Earliest symptoms and dates. 6.
Disease certified: Date of certificate: Date of receipt of do. 7.
By whom certified. Name of medical man, and date of his first visit. 8.
Rest of Family. { Names and Ages. 9. / Workplaces and Schools. 10.
Milkman: Name: Address: 11.
Source of Water supply. Overflow and condition of cistern. 12.
No. of inmates: of rooms, Condition, Size, Ventilation, &c. 13.
Drainage. { Sinks and Washbasins. 14. / Basement drains: Bathrooms. 15. / Other drains (fall spouts, yard drains) 16. / W.C.: Main Sewers. 17.
Privy. { kind, state, distance, No. houses using it. 18. / Ashplaces, do. 19.
Nuisances. 20.
Sources of Infection. 21.

LEEDS.

APPENDIX III.

SCHEDULE OF THE WORK DONE BY THE WARD INSPECTOR

For Directions for filling up this Schedule,—See separate Sheet.

SANITARY DEPARTMENT, LEEDS.

Inspector District Record of Work Week ended 189 .

	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.	Week.
HOUSE INSPECTION.								
1. Houses and premises completely examined on account of Infective disease								
2. Houses and premises completely examined on account of Alleged nuisances								
3. Houses and premises completely examined on account of House-to-house work								
4. Houses and premises examined only as to Occupants								
5. Houses and premises examined only as to Buildings and offices								
6. Houses and premises examined only as to Drainage								
7. Number of houses wholly or partly examined								
8. Total number of above houses where sanitary defects were found								
9. Sanitary defects found in above houses								
NUISANCES, &c.								
10. Nuisances found in above or other houses:— Houses dirty								
11. " overcrowded								
12. " damp or dilapidated								
13. " with defective eave-gutters or fall pipes								
14. " badly drained								
15. " without sink drain								
16. " badly lighted								
17. " badly ventilated								
18. " with defective or insufficient closet accommodation.								
19. " with dirty closets								
20. " with drains, &c. temporarily stopped								
21. " with other nuisances								
22. Total nuisances found in houses								
23. Number of houses in which above nuisances were found								
24. Street gullies stopped								
25. Offensive accumulations								
26. Other outside nuisances								
27. Total nuisances found								
28. Complaints unfounded								
OTHER WORK DONE.								
29. Additional visits paid to houses for Infective disease								
30. Additional visits paid to houses for Nuisances found								
31. Additional visits paid to houses for Completion of reports								
32. Additional visits paid to houses for Other causes								
33. Special examinations of drains by tests								
34. Defects found by ditto								
35. Time of leaving office								
36. Time of returning to office								
37. Appointments								
38. Notices and letters served								
39. Dwelling-houses unfit for human habitation closed								
40. Dwelling-houses rendered fit for human habitation								
41. Houses cleansed								
42. Overcrowded houses dealt with								
43. Defective spouting, &c. repaired								
44. New midden privies built								
45. Old midden privies repaired								
46. Do. rebuilt								
47. Privies converted into trough waterclosets								
48. Do. do. ordinary waterclosets								
49. Waterclosets erected								
50. New dry ashpits or tubs								
51. New trough waterclosets built								

	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.	Week.
52. Pail closets converted into waterclosets								
53. Do. altered into privies								
54. Closets cleansed (lime-washed, &c.)								
55. Drains in course of construction inspected								
56. „ „ of re-construction „								
57. „ inspected when connexion made to sewer								
58. Disconnexions of house drains effected								
59. Cesspools filled up								
60. Public or private wells abolished								
61. Houses supplied with town's water								
62. Trough and waterclosets repaired								
63. Other house nuisances remedied								
64. Total houses for which above work done								
65. Houses in which all defects found have been remedied								
66. Street gullies cleansed								
67. Offensive accumulations removed								
68. Pollutions of river or streams remedied								
69. Other non-domestic nuisances removed								
70. Additional visits paid to inspect work in progress								
71. Total nuisances abated								

Sanitary Work.

Directions for filling up Schedule.

The first part of the schedule refers to house inspection. By a house is meant not only "schools, factories, "and other buildings in which persons are employed" (Public Health Act def.), but also includes buildings and yards within the curtilage, and "subordinate to "the occupation of a house as a residence" (Glen). The sink gully, for instance, though outside the building, is within the curtilage, and is part of the house. In the same way closets in the yard are also part of the house, but street gullies outside the curtilage are not part of the house. "Completely examined" (lines 1, 2, and 3 of schedule) applies only to houses where the whole house, from top to bottom, every drain inside and outside the house, all the offices, and everything within the curtilage has been examined. It implies also the ascertaining of the number of inmates and the amount of sleeping and closet accommodation for them, and in infectious cases the registering of the workplace or school of each inmate. No house is completely examined in which all the particulars required for either the zymotic or house-to-house book are not ascertained.

Line 1.—Every house in which a case of infectious disease occurs must be completely examined.

Line 2.—Every house in which there is an alleged nuisance should be completely examined, unless orders are received to the contrary, in which case it must not be entered under 2, but under 4, 5, or 6, according as the information ascertained refers to (4) the *occupants and their habits*, including the information required for columns 2, 3, 4, 6, 7, 8, 9, 10, and 32 of the house-to-house book; (5) the *buildings and offices*, including the information required for columns 2, 3, 4, 7, 8, 11, 12, 13, 14, 15, 26, 27, 28, 29, 30, 31, and 32; or (6) *drainage* including the answers required for columns 2, 3, 4, 5, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 30, and 32 in the house-to-house book. The details as to houses thus partially examined must be entered on one of the "house" forms to be used afterwards for filling up the details in the house-to-house book, when the house is reached in the systematic examination of the district. This may also be done when a complete examination of a house is made out of its proper order.

Line 7.—The totals of Nos. 1, 2, 3, 4, 5, and 6 will come under 7, and must usually correspond. No house is to be counted twice within a short period. If a house is partially examined which has been partially examined for another purpose a short time before, it must be marked down and a note to that effect made at the foot. If such partial examination completes the examination of the house, it can then be entered by a note at the bottom as a house completely examined (giving the reference number to the zymotic or house-to-house book where it is entered), and it will be so counted in the quarterly report. When a house is partially examined under two of the three headings of 4, 5, and 6, it may be marked under both, but must be counted only once in the total (line 7), and a note must be made at the foot.

Line 8.—Each house is only to be counted once, no matter how many defects are found. In lines 29, 30, 31, and 32 is opportunity for entering visits paid which cannot be considered as either complete or partial inspections of the tenements.

Line 9.—This line only applies to houses entered in lines above. If several defects are found in one house, each defect is to be counted in this line. Several defects, say in one soil pipe, are, however, only to be counted as one defect, and the defects counted are to be grouped as far as possible, according to the analysis of nuisances given in lines 10 to 21. Thus a house which is dirty and ill-ventilated has two sanitary defects, and is entered as 2 in line 9, and as 1 in each of lines 10 and 17.

Lines 10 to 21 contain a rough analysis of the nuisances ordinarily met with in the curtilage of a house. The nuisances discovered on examination of a house, the examination of which has been entered in some of the lines 1 to 9 are also to be placed in their proper places in lines 10 to 21, and also nuisances found within the curtilages of other houses not sufficiently examined at the time be entered under lines 1 to 6. For instance, a stopped gully under a sink pipe is a nuisance found in a house, but unless the house is further examined it would only be entered in line 20.

Line 22 will be the total of lines 10 to 21, under line 23 is to be entered the number of houses in which the nuisances totalled in line 22 occurred, for instance —a house which was dirty and ill-ventilated, and entered under both lines, 10 and 17, would count as two in line 22, but as one in line 23.

Lines 24, 25, and 26 are intended for nuisances outside the curtilages of houses.

Line 27 is the total nuisances found whether inside or outside houses, and includes the total in line 22.

Line 28 is intended for entry of examinations made on account of nuisances alleged, but where no nuisance was found. It is not intended for the entry of houses examined and entered under lines 1 to 6, in which nothing was found wrong.

Lines 29, 30, 31, and 32 afford opportunity for the entry of visits paid to houses either to obtain further information, to see whether nuisances previously found have been abated, or to make a preliminary examination of the premises insufficient to be entered under columns 1 to 7.

In line 33 word drain is used as in line 55, &c.

In line 34 every defect discovered by means of the tests is to be counted.

Line 37.—Write place of appointment in left-hand column and hour in column for day. If necessary to write several places of appointment in same line, tick them (* or †) to show which place corresponds with which hour. The hours of appointment may be filled up in advance, and if appointment not kept must be

LEEDS.

crossed out. Should there not be room for the places of appointment in the first column, the address may be written on the back of the sheet, and a reference note made in line 37. Appointments are only to be entered where an engagement is made with someone else to be at a certain place at a certain time. Line 37 is not intended to show where the Inspector was at every hour of the day, but only where he has made a distinct appointment with someone else.

In lines 55, &c., the word drain is used to signify the whole drain between any house and the sewer. A sewer means a drain common to more than one house. If a house is separately connected to two sewers it will have two drains.

Line 58.—"Disconnection" here means the separation of any inside drain, waste pipe, or fall pipe from the drain by means of a trapped gully. Each waste pipe, &c., so cut off is to be counted.

Line 64 is intended to be a record of the total number of houses affected by the work done. If 20 nuisances within the curtilage of one house are abolished they are entered in line 64 as one, but if a trough water-closet used by 12 houses is repaired, the entry in line 64 would be 12.

Line 65 applies to houses in the same way as 64, but only to such houses as have been rendered entirely free from sanitary defects. No house, for instance, only separated from the drain by a trap, is to be entered under this heading.

Lines 66, 67, 68, 69, are for nuisances outside the curtilage of any house which have been abated.

Line 70.—Other visits to work in progress to be entered here. Under lines 39 to 69, the work done is to be entered only once, and only when complete.

Line 71.—Includes all nuisances abated and defects remedied, whether in one house or several.

APPENDIX IV.

FORM OF DEATH RETURNS MADE BY THE DISTRICT REGISTRARS TO THE SANITARY DEPARTMENT.

* The registrar is requested to leave the colomns 4 & 11 blank for office purposes.

	Births.	Deaths.
Males - -		
Females -		
Total - -		

BOROUGH OF LEEDS.

Deaths registered from No. to No. in the Sub-District of
during the week ended 189 .

No. in Register.	Date of Death.	Place of Death.	* Ward.	Name.	Sex.	Age.	Occupation.	Cause of Death.					By whom certified. (Name of Doctor).	Date of Registration.
								Primary.		*M.O.H.'s.	Secondary.			
								Disease.	Duration.	Note.	Disease.	Duration.		
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.

Registrar.

APPENDIX V.

SCHEDULE OF INSPECTOR'S REPORT ON CASES OF INFECTIVE DISEASE.

S.P. = Small-Pox.
M. = Measles.
Sc. = Scarlet Fever.
T'us. = Typhus Fever.
I. = Influenza.
Wh. C. = Whooping-Cough.
Diph. = Diphtheria.
C.F. = Continued Fever, Febricula.
Ent. = Enteric, Typhoid, Gastric Fever.
Diar. = Diarrhœa.
E. = Erysipelas.
Sept. = Septicæmia, Pyæmia
P.F. = Puerperal Fever.
Cr. = Croup.
Pn. = Pneumonia.
Pl. Pn. = Pleuro-Pneumonia.
B. Pn. = Broncho-Pneumonia.
Pl. = Pleurisy.
Empy. = Empyæma.

Report to Medical Officer of Health. Leeds.
Infective Diseases. day of 189 .

	Surname.	Christian Name.	Age.	Address.	Ward.	Disease.	Condition when Visited.	Is there a through draught?	Drainage.		Closets.				
									Entirely severed.	Otherwise defective.	W.C.	T.W.C.	M.	Pail.	Condition.
1															
2															
3															
4															
5															
6															
7															
8															
9															
10															

ER.

* If there is direct connexion between house and drains in any way, mark the particular drain "D," thus—"Cellar 'D.'" If through a syphon trap "T," thus—"Sink T." If the trap is efficiently ventilated outside "TV," thus—"Cellar TV." If either drain is cut off (*i.e.*, disconnected) mark it also C, thus—"Sink C." If the down-spouts are connected with the drain, "S," stating with which drain, thus—"Cellar S."

† If the soil-pipe goes above the eaves, same size, mark "FV." If smaller, give the diameter in inches of ventilating pipe, thus—"V1½."

	Milkman.	Water Supply.	No. of Inmates, including Lodgers and Infants.	No. of Rooms.	Size, Condition, Ventilation, and designation of Apartments.	Drainage. Sinks.	Drainage. Basement Drains.	Drainage.	W.C. †	Privy. What system, Condition, Distance from House, Number of Houses using the Privy.	Ashpit. System, Condition, Distance from House. Number of Houses using.	Remarks. Mem. as to Pigstyes, Offensive Chemical, or other Works; Levels from Outside Drains, Trapping or otherwise of Street Gullies. Source of Infection; making remarks, for which there is no space, at the end of the book, giving reference here to page.
	L——, York Road.	*Towns.*	*3+1*	*5*	*13'×12', 3"×8', clean: W. and F. "through" 1 living room, 3 bedrooms, (scullery).*	*T.*	*None.*	*S. Yard drain T. Main sewer 3 yards.*		*W.C., clean. Adjoining. 1.*	*Dry, good. 2 yards. 1.*	Flushed, *December 21* inst. Disinfected ½ *Dec. 23* (2165) *Dec. 24* (2183). " ½ " *28* (2207) *Jan. 3* (2258). Privy emptied ½ *Dec. 24.* Ashpit " ½ Notices, *none.* Refer to *Inspector Burton and Smith's books.*

in black type (red in original) to the sub-registration district.

All the Roman type is printed in the original register; the copy of the entry is shown in italic type.

X

APPENDIX VII.

TABLE OF CASES OF SMALL-POX AT LEEDS—1891.

No.	Reference to Table in Medical Officer's Report.	Date at which Case heard of.	Sex.	Age.	Date of Attack.	Date of Rash.	Date of Removal to Hospital.	Result.	Removed to Sanatorium. Males.	Removed to Sanatorium. Females.	Cases arising after.
1	1	April 22	M.	24	April 12	April 15	—	R.	—	—	
2	2	May 1	F.	24	„ 27	„ 28	—	„	—	—	
3	3	„ 11	F.	22	May 5	May 8	May 11	„	1	2	
4	7	June 23	M.	15	June 20	June 22	June 23	„	5	3	
5	16	July 4	M.	36	„ 26	„ 30	July 4	„	—	2	Nos. 6, 7.
6	17	„ 11	F.	35	July 9	July 11	„ 11	„	—	—	
7	18	„ 15	F.	15	„ 13	„ 15	„ 15	„	—	—	
8	19	„ 28	M.	7	„ 24	„ 28	„ 28	D.	2	2	
9	24	Aug. 9	F.	32	Aug. 6	Aug. 7	Aug. 10	R.	2	1	Nos. 10, 11.
10	25	„ 21	F.	68	„ 19	„ 21	„ 21	„	—	—	
11	26	„ 21	M.	36	„ 19	„ 21	„ 21	„	—	—	
12	28	„ 10	M.	22	„ 6	„ 9	„ 10	„	2	8	No. 13.
13	31	„ 27	F.	⅄	—	„ 23	„ 27	„	—	—	
14	39	„ 11	F.	1½	—	„ 2	„ 22	„	—	1	
15	40	„ 22	M.	46	—	„ 18	„ 22	„	—	—	
16	41	„ 22	M.	13	—	„ 22	„ 22	„	—	—	
17	42	„ 22	M.	11	—	„ 22	„ 22	„	—	—	
18	43	„ 22	M.	8	—	—	„ 22	„	—	—	
19	44	„ 22	F.	3	—	—	„ 22	„	—	—	
20	46	„ 12	M.	21	July 20	July 23	„ 22	„	3	3	
21	47	„ 12	F.	14	Aug. 6	Aug. 8	„ 22	„	—	—	
22	54	„ 15	M.	21	„ 7	„ 10	„ 15	„	2	2	No. 23.
23	57	„ 26	F.	25	„ 24	„ 26	„ 26	„	—	—	
24	59	„ 17	F.	21	„ 9	„ 11	„ 17	„	4	1	
25	60	„ 17	M.	10	July 27 ?	„ 2 ?	„ 18	„	—	—	
26	66	„ 19	F.	21	Aug. 11 ?	„ 17	„ 19	„	3	4	No. 27.
27	67	„ 22	M.	17	„ 21	„ 21	„ 22	„	—	—	
28	74	„ 25	F.	20	„ 15	„ 18	„ 27	„	3	1	
29	75	Sept. 14	M.	30	Sept. 6	Sept. 8	Sept. 14	„	2	—	Re-admissions.
30	79	Aug. 26	M.	⅄	Aug. 21	Aug. 23	Aug. 26	„	1	4	
31	80	„ 26	M.	4	„ 22	„ 23	„ 26	„	—	—	
32	86	Sept. 1	M.	28	„ 27	Sept. 1	Sept. 1	„	—	2	
33	90	„ 1	F.	19	„ 30	„ 2 ?	„ 3	„	3	1	
34	93	„ 7	F.	24	„ 27 ?	„ 7	„ 7	„	1	3	
35	100	„ 8	M.	22	Sept. 3	„ 7	„ 9	„	6	2	Nos. 37, 38.
36	101	„ 8	M.	19	„ 5	„ 8	„ 9	„	—	—	
37	102	„ 10	M.	10	„ 10	„ 10	„ 11	„	—	—	
38	103	„ 12	F.	6	„ 12	„ 12	„ 12	„	—	—	
39	110	„ 9	M.	40	„ 6	„ 9	„ 9	„	2	1	
40	114	„ 12	F.	39	„ 6	„ 10	„ 12	„	2	3	
41	120	„ 13	F.	20	„ 9	„ 12	„ 12	„	4	5	
42	130	„ 14	F.	11	„ 6	„ 9	„ 15	„	3	3	
43	137	„ 27	F.	47	„ 20	„ 25	„ 28	„	1	1	
44	140	„ 23	M.	43	„ 20	„ 26	„ 28	„	2	2	
45	145	„ 28	M.	18	„ 25	„ 26	„ 28	„	3	1	
46	150	„ 30	M.	5	„ 1	„ 4	Oct. 1	„	2	2	
47	151	„ 30	F.	7	„ 14	„ 16	„ 1	„	—	—	
48	156	Dec. 16	M.	40	Dec. 10	Dec. 14	Dec. 16	„	—	4	

N.B.—This table has been extracted from the detailed table given by Dr. Cameron in his annual Report. In that table the patients and the persons quarantined are numbered consecutively. These numbers I have inserted in the second column to facilitate reference.

LEEDS.

APPENDIX VIII.

LEEDS, 1891.

CASES OF SMALL-POX TREATED IN BOROUGH HOSPITAL.

*Table of Vaccination Returns, showing Form of Disease.**

——	No.	Deaths.	Mild discrete Form.	Med. discrete Form.	Semi-confluent Form.	Confluent Form.
Well vaccinated -	25	—	19	5	*1	—
Imperfectly vaccinated	12	—	1	5	*1	*5
Said to be vaccinated, but no evidence.	2	—	—	—	2	—
Unvaccinated - -	5	1	—	—	—	5
Total - -	44	1	20	10	4	10

* One of these resolved without suppuration.

Table showing Number of Visible Cicatrices, each Case, and the Number of Deaths.

——	No.	Deaths.
Four cicatrices - -	3	—
Three ,, - - -	9	—
Two ,, - - -	19	—
One ,, - - -	6	—
No ,, - - -	7	1
Total - - -	44	1

* Compiled by Mr. A. E. Pearson, L.R.C.P., Ed., M.R.C.S., Resident Medical Officer, and published in his report for the year 1891.

APPENDIX IX.

LEEDS.—Table of Cases of Small-pox, 1892–1893.

1892.

No.	Name.	Sex.	Age.	Vaccination. Good.	Vaccination. Imperfect.	Vaccination. Alleged, but no Marks.	Not Vaccinated.	Date of Attack.	Date of Appearance of Rash.	Date of Removal to Hospital.	Type of Attack.	Result.	Date of Discharge.	Days in Hospital.	Removed to Sanatorium. Males.	Females.	Subsequently Attacked.	Remarks.
1	J. C.	M.	22	2 marks	—	—	—	?	Jan. 4	Jan. 5	Discrete	Recovered	Feb. 12	39	1	1	—	
2	T. G.	M.	32	—	3 ill-defined	—	—	Feb.	Feb. 9	Feb. 10	„	„	Mar. 11	31	—	—	—	
3	J. W. B.	M.	26	—	—	*	—	Mar. 15	Mar. 18	Mar. 21	Confluent	„	May 3	44	—	2	—	
4	M. E.	F.	31	—	3 ill-defined	—	—	Apr. 13	Apr. 13	Apr. 16	„	„	July 13	89	3	3	—	Gave birth to No. 5 on 14 April.
5	M. E.	F.	1 day	—	—	—	*	—	—	—	?	Died	Apr. 15	1	—	—	—	Prematurely born: died next day; death registered from "Small-pox" but no signs.
6	M. A. W.	F.	16	2 marks	—	—	—	Apr. 17	Apr. 23	Apr. 23	Discrete	Recovered	May 31	39	3	6	—	
7	W. R.	M.	46	2 „	—	—	—	—	July 8	July 9	Semi-confluent.	„	Sept. 3	57	—	—	—	Lodging-house, 30 inmates.
8	B. H.	M.	31	3 „	—	—	—	July 18	„ 20	„ 20	Mild	„	„ 3	46	—	—	—	From Union Infirmary, where went from same lodging-house as No. 7.
9	G. H.	M.	30	2 „	—	—	—	—	„ 21	„ 21	Discrete	„	Aug. 20	31	—	—	—	Same lodging-house as 7 and 8.
10	J. B.	M.	32	2 „	—	—	—	—	„ 21	„ 21	Semi-confluent.	„	Sept. 13	56	—	—	—	„ „ „
11	C. L.	M.	31	3 „	—	—	—	—	„ 22	„ 23	„	„	„ 10	51	—	—	—	„ „ „
12	J. H.	M.	62	1 mark	—	—	—	—	„ 23	„ 23	Mild	„	Aug. 20	29	—	—	—	„ „ „
13	A. D.	M.	30	2 marks	—	—	—	Aug. 8	Aug. 10	Aug. 11	Discrete	„	Sept. 20	42	—	3	—	
14	M. B.	F.	28	2 „	—	—	—	„ 5	„ 12	„ 13	„	„	„ 13	32	1	2	—	
15	M. B.	F.	23	2 „	—	—	—	„ 10	„ 13	„ 15	„	„	„ 13	30	1	1	—	
16	T. B.	M.	32	3 „	—	—	—	„ 11	„ 13	„ 17	Mild	„	„ 13	18	5	1	No. 17	
17	A. B.	M.	6	4 „	—	—	—	„ 26	„ 27	„ 27	„	„	Nov. 5	41	—	—	—	Vaccinated, 8 days before. "Under" vaccination.
18	M. J.	F.	19	*	—	—	—	—	„ 14	„ 17	„	„	„ 28	28	—	—	—	From lodging-house (29 other inmates).
19	M. A. S.	F.	23	—	*	—	—	Aug. 14	„ 16	„ 17	Semi-confluent.	„	„ 27	42	—	—	—	„ „ „
20	A. C.	F.	24	1 mark	—	—	—	„ 15	„ 17	„ 18	„	„	Oct. 8	52	—	4	—	
21	A. G.	F.	24	—	—	—	*	„ 12	„ 17	„ 18	Confluent	„	„ 8	52	2	1	—	
22	J. S.	M.	12	2 marks	—	—	—	„ 12	„ 14	„ 19	Mild	„	Sept. 20	33	—	—	—	7 inmates of house not sent to Sanatorium.
23	E. A. M.	M.	13	—	—	—	*	Sept. 18	Sept. 20	Sept. 22	Confluent	„	Nov. 5	46	4	3	—	

LEEDS.—Table of Cases of Small-pox, 1892—*continued*.

No.	Name.	Sex.	Age.	Vaccination.			Not Vaccinated.	Date of			Type of Attack.	Result.	Date of Discharge.	Days in Hospital.	Removed to Sanatorium.			Remarks.
				Good.	Imperfect.	Alleged, but no Marks.		Attack.	Appearance of Rash.	Removal to Hospital.					Males.	Females.	Subsequently Attacked.	
24	W. H. L.	M.	33	3 marks	—	—	—	Sept. 23	Sept. 25	Sept. 27	Confluent	Recovered	Nov. 15	10	—	3	—	
25	A. H.	F.	17	—	2 poor m.	—	—	„ 27	„ 30	Oct. 1	„	„	„ 22	53	5	3	—	
26	R. M.	M.	33	—	2 fair	—	—	„ 30	Oct. 3	„ 3	„	„	Dec. 10	69	—	—	—	From Union Workhouse.
27	G. G.	M.	34	—	2 fair	—	—	—	„ 1	„ 3	Mild	„	Nov. 26	55	2	2	—	
28	W. B.	M.	65	—	—	*	—	Sept. 30	„ 3	„ 4	„	„	„ 26	54	—	—	—	„ „ „
29	L. O.	F.	3/12	—	—	—	*	—	„ 4	„ 4	Confluent	Died	Oct. 11	8	2	1	—	
30	J. B.	M.	53	—	2 indistinct	—	—	Oct. 1	„ 5	„ 5	„	Recovered	Dec. 10	67	—	—	—	„ „ „
31	J. R. H.	M.	39	3 marks	—	—	—	„ 7	„ 11	„ 11	Coherent	„	Nov. 8	29	8	—	No. 32	
32	J. F.	M.	32	4 „	—	—	—	„ 20	„ 23	„ 23	Discrete	„	„ 19	28	—	—	—	
33	W. G.	M.	28	?	?	—	?	—	Sept. 27	„ 13	Coherent	„	Dec. 27	76	5	2	—	Removed from workhouse.
34	J. N.	M.	46	—	—	*	—	Oct. 14	Oct. 18	„ 19	Semi-confluent.	„	„ 10	52	—	—	—	„ „ „
35	H. R.	M.	48	—	2 poor	—	—	—	„ 24	„ 25	Discrete	„	„ 29	57	2	—	—	
36	A. W.	M.	53	—	—	—	*	Oct. 22	„ 23	—	—	Died	Oct. 30	—	—	—	—	Not known till after his death.
37	R. W.	M.	40	—	2 poor	—	—	Nov. 2	Nov. 4	Nov. 4	Confluent	Recovered	Dec. 31	48	3	4	No. 38, 39.	
38	A. W.	F.	34	—	„	—	—	„ 2	„ 5	„ 5	Discrete	„	„ 24	40	—	—	—	From same cause as No. 37.
39	M. B.	F.	30	—	„	—	—	—	„ 5	„ 5	„	„	„ 23	39	—	—	—	„ „ „
40	T. L.	M.	46	—	—	*	—	—	Oct. 31	„ 2	Semi-confluent.	„	„ 27	57	—	—	—	Removed from Salvation Army Barracks (85 inmates).
41	R. B.	F.	28	2 marks	—	—	—	Nov. 4	Nov. 5	„ 5	Confluent	„	„ 31	67	—	2	—	
42	S. D.	M.	28	—	2 poor	—	—	Oct. 31	„ 4	„ 7	Discrete	„	„ 27	51	—	—	—	From Holbeck Workhouse.
43	A. H.	F.	16	4 marks	—	—	—	Nov. 5	„ 8	„ 8	„	„	„ 10	33	6	5	No. 44	
44	A. H.	F.	18	—	2 poor	—	—	„ 8	„ 12	„ 12	„	„	„ 29	39	—	—	—	
45	L. W.	F.	6	—	—	—	*	Oct. 22	Oct. 27	„ 9	Confluent	„	„ 22	44	1	1	—	Same house as No. 45.
46	H. W.	F.	27	4 marks	—	—	—	„ 3	„ 8	„ 9	Mild	„	Nov. 21	13	—	—	—	Convalescent when admitted.
47	J. T. M.	M.	30	3 „	—	—	—	Nov. 5	Nov. 8	„ 9	„	„	Dec. 13	35	3	1	—	
48	J. W. S.	M.	11	3 „	—	—	—	„ 1	„ 6	„ 9	„	„	„ 10	31	—	—	—	
49	S. N.	F.	29	—	2 fair	—	—	„ 4	„ 10	„ 9	„	„	„ 10	31	—	—	—	Re-vaccinated 10 Nov.
50	H. C.	M.	6	—	—	*	—	„ 5	„ 7	„ 10	Confluent	„	Jan. 14	66	4	7	Nos. 51, 52.	

LEEDS.—Table of Cases of Small-pox, 1892—*continued*.

No.	Name.	Sex.	Age.	Vaccination.			Not Vaccinated.	Date of			Type of Attack.	Result.	Date of Discharge.	Days in Hospital.	Removed to Sanatorium.			Remarks.
				Good.	Imperfect.	Alleged, but no Marks.		Attack.	Appearance of Rash.	Removal to Hospital.					Males.	Females.	Subsequently Attacked.	
51	A. R. C.	M.	13	3 marks	—	—	—	—	Nov. 20	Nov. 22	Discrete	Recovered	Jan. 10	19	—	—	—	
52	H. E. C.	F.	2 weeks	4 „	—	—	—	Nov. 19	„ 20	„ 21	Mild	„	Dec. 10	20	—	—	—	"Under" vaccination. Vaccinated at Sanatorium.
53	R. F.	M.	26	—	—	—	*	„ 8	„ 10	„ 12	Haemorrhagic.	Died	Nov. 14	3	—	—	—	These cases, of whom No. 54 was then convalescent, were removed together, and the remaining member of household taken to Sanatorium.
54	A. E. F.	F.	26	2 good	—	—	—	Oct. 22	Oct. 26	„ 12	Mild	Recovered	Dec. 10	29	—	1	—	
55	C. F.	M.	4	—	—	—	*	Nov. 7	Nov. 9	„ 12	Confluent	Died	Nov. 14	3	—	—	—	
56	F. F.	M.	2	—	—	—	*	„ 5	„ 8	„ 12	Semi-confluent.	Recovered	Dec. 10	29	—	—	—	
57	E. I.	F.	6	—	2 fair	—	—	„ 9	„ 11	„ 12	Discrete	„	„ 10	29	4	3	—	
58	E. R.	F.	24	—	Indefinite	—	—	„ 8	„ 12	„ 12	Mild	„	„ 22	41	1	2	—	
59	R. W.	M.	25	—	2 poor	—	—	„ 2	„ 12	„ 13	Semi-confluent.	„	„ 22	40	—	2	—	
60	A. W.	F.	28	—	2 fair	—	—	„ 10	„ 12	„ 14	Mild	„	„ 10	27	3	2	—	
61	H. M. H.	F.	29	—	2 poor	—	—	„ 11	„ 12	„ 14	Discrete (severe).	„	Jan. 24	72	3	4	No. 62	
62	M. E. H.	F.	15	At hospital	—	—	—	—	„ 21	„ 22	Mild	„	Dec. 31	40	—	—	—	"Under" vaccination.
63	J. K.	M.	23	2 good	—	—	—	Nov. 12	„ 14	„ 14	Discrete	„	„ 6	23	1	2	—	
64	A. C.	F.	26	—	2 poor	—	—	„ 8	„ 11	„ 14	Mild	„	„ 12	29	1	2	—	
65	S. B.	M.	23	3 marks	—	—	—	„ 12	„ 15	„ 15	Confluent	„	„ 31	47	2	1	—	
66	M. C.	F.	38	—	2 poor	—	—	„ 12	„ 15	„ 16	„	„	Jan. 20	67	2	7	—	
67	W. W.	M.	29	2 marks	—	—	—	„ 3	„ 6	„ 16	Mild	„	Dec. 3	18	2	3	—	
68	E. B.	F.	10	—	—	*	—	„ 14	—	„ 18	Discrete (severe).	„	„ 20	33	3	5	—	
69	J. W.	M.	31	—	2 poor	—	—	„ 12	„ 14	„ 18	Mild	„	„ 27	40	1	3	—	
70	E. G.	M.	5	—	—	—	*	Oct. 31	„ 2	„ 19	Confluent	„	Jan. 10	54	—	—	—	
71	A. N.	M.	35	—	—	*	—	Nov. 14	„ 17	„ 18	Semi-confluent.	„	Dec. 31	43	2	3	No. 72	
72	A. N.	F.	40	—	2 poor	—	—	„ 18	„ 19	„ 19	Discrete	„	Jan. 7	50	—	—	—	
73	C. A.	M.	38	—	—	*	—	„ 17	—	„ 18	Mild	„	Dec. 27	40	—	—	—	From Hunslet Workhouse. Small-pox previously
74	A. A.	F.	36	—	1 poor	—	—	„ 8	„ 18	„ 18	„	„	„ 27	40	—	—	—	
75	E. B.	F.	24	—	—	—	*	„ 14	„ 16	„ 18	Confluent		Jan. 14	58	1	—	—	
76	T. M.	M.	24	—	2 faint	—	—	„ 14	„ 17	„ 19	Discrete	„	Dec. 27	39	—	1	—	
77	T. W.	M.	56	—	2 fair	—	—	7	19	„ 21	„	„	„ 20	30	2	3	—	
78	R. F.	M.	29	—	—	*	—	„ 18	„ 19	„ 21	„	„	Jan. 14	55	—	—	—	From Salvation Army Barracks, No. 40.
79	W. B.	M.	26	3 marks	—	—	—	„ 19	„ 22	„ 22	Semi-confluent.	„	„ 28	69	1	3	—	

LEEDS.—Table of Cases of Small-pox, 1892—*continued*.

No.	Name.	Sex.	Age.	Vaccination. Good.	Imperfect.	Alleged, but no Marks.	Not Vaccinated.	Date of Attack.	Date of Appearance of Rash.	Date of Removal to Hospital.	Type of Attack.	Result.	Date of Discharge.	Days in Hospital.	Removed to Sanatorium. Males.	Females.	Subsequently Attacked.	Remarks.
80	F. M.	M.	23	4 marks	—	—	—	Nov. 19	Nov. 23	Nov. 23	Discrete	Recovered	Jan. 14	54	—	5	—	
81	A. J.	M.	16	—	2 poor	—	—	„ 19	„ 23	„ 24	Mild	„	Dec. 22	29	1	1	—	
82	J. T.	M.	48	—	2 „	—	—	„ 19	„ 24	„ 25	Discrete	„	„ 27	33	—	—	—	From Holbeck Workhouse.
83	M. S. E.	F.	25	—	—	—	*	„ 23	„ 27	„ 27	Semi-confluent.	„	Jan. 17	32	2	—	—	
84	C. W.	F.	20	2 linear	—	—	—	„ 24	„ 27	„ 27	Discrete	„	„ 31	35	3	—	—	
85	J. H. H.	M.	20	2 „	—	—	—	„ 22	„ 24	„ 28	„	„	„ 27	30	3	1	—	
86	A. S.	M.	30	—	—	—	*	„ 26	„ 27	„ 28	Confluent	„	„ 14	48	5	1	—	
87	L. H.	M.	23	—	2 poor	—	—	„ 26	„ 27	„ 28	Discrete	„	„ 27	31	—	—	—	
88	T. J. T.	M.	34	—	2 fair	—	—	„ 18	„ 29	„ 30	„	„	„ 31	32	7	6	No. 89	
89	J. K.	M.	39	—	2 „	—	—	Dec. 14	Dec. 16	Dec. 16	„	„	„ ?	?	—	—	—	
90	J. B. H.	M.	20	2 good and	2 poor	—	—	Nov. 26	„ 1	„ 1	„	„	Dec. 31	31	3	1	—	
91	A. W.	F.	9	3 good	—	—	—	„ 27	Nov. 29	„ 1	„	„	Jan. 7	40	2	—	—	
92	P. B.	F.	28	—	3 poor	—	—	„ 26	„ 28	„ 1	„	„	„ 7	41	3	2	—	
93	H. J.	M.	19	2 good	—	—	—	„ 29	Dec. 2	„ 6	„	„	„ 14	40	4	5	—	
94	A. W.	F.	36	2 „	—	—	—	Dec. 2	„ 7	„ 7	„	„	„ 7	32	1	—	—	
95	H. L.	F.	38	—	1 indefinite	—	—	„ 5	„ 8	„ 8	Confluent	Died	Dec. 20	13	2	4	—	Removed together from same house.
96	J. F.	M.	40	—	3 fair	—	—	„ 5	„ 8	„ 8	Semi-confluent.	Recovered	Jan. 10	34	—	—	—	
97	A. N.	F.	25	—	1 inferior	—	—	„ 4	„ 7	„ 8	Mild	„	„ 7	31	3	3	—	Re-vaccinated, Dec. 2, successfully.
98	T. C. B.	M.	24	3 good	—	—	—	„ 3	„ 5	„ 9	„	„	„ 7	30	1	4	—	
99	W. L.	M.	37	—	2 fair	—	—	„ 7	„ 9	„ 10	Confluent	Died	Dec. 16	7	2	3	No. 100	
100	M. L.	F.	16	4	—	—	—	—	„ 11	„ 11	Mild	Recovered	Jan. 7	28	—	—	—	Re-vaccinated, Dec. 12.
101	M. L.	M.	18	?	?	?	?	Dec. 6	„ 9	„ 11	Discrete	„	„ 10	31	2	3	—	Another household in contact with this also sent to Sanatorium. Male, 1; females, 6.
102	D. H.	M.	26	—	—	—	*	„ 7	„ 10	„ 12	Confluent	Died	Dec. 21	10	5	2	—	
103	W. B.	M.	20	3	—	—	—	„ 12	„ 13	„ 13	Mild	Recovered	Jan. 23	42	1	4	—	
104	W. P.	M.	38	—	2 poor	—	—	„ 10	„ 13	„ 14	Semi-confluent.	„	„ 17	35	2	2	Nos. 105, 106.	
105	J. W.	F.	39	—	1 bad	—	—	„ 26	„ 27	„ 28	„	„	„ 31	35	—	—	—	
106	A. W.	M.	19	—	—	*	—	„ 22	„ 24	„ 28	Confluent	„	Feb. 11	46	—	—	—	
107	M. E. B.	F.	21	4	—	—	—	„ 9	„ 11	„ 15	Discrete	„	Jan. 17	34	2	1	—	

LEEDS.—Table of Cases of Small-pox, 1892—*continued*.

No.	Name.	Sex.	Age.	Vaccination.			Not Vaccinated.	Date of			Type of Attack.	Result.	Date of Discharge.	Days in Hospital.	Removed to Sanatorium.			Remarks.
				Good.	Imperfect.	Alleged, but no Marks.		Attack.	Appearance of Rash.	Removal to Hospital.					Males.	Females.	Subsequently Attacked.	
108	F. A.	F.	22	—	4 fair	—	—	Dec. 11	Dec. 13	Dec. 15	Discrete	Recovered	Jan. 20	37	2	6	Nos. 109, 110, 111.	
109	E. A.	F.	22	4	—	—	—	„ 25	„ 27	„ 28	Mild	„	„ 20	24	—	—	—	
110	A. A.	F.	15	4	—	—	—	„ 26	„ 28	„ 28	„	„	„ 20	24	—	—	—	
111	L. A.	F.	12	4	—	—	—	„ 25	„ 27	„ 28	„	„	„ 20	24	—	—	—	
112	J. W. J.	M.	43	—	—	—	*	„ 13	„ 14	„ 16	Confluent	„	„ 28	44	8	—	—	From lodging-house (64 inmates); at this time 45. Of these, 8 occupying same room as No. 112 sent to Sanatorium.
113	J. H.	F.	22	—	4 poor	—	—	„ 12	„ 15	„ 19	Mild	„	„ 17	30	1	—	No. 128	
114	H. L.	M.	31	—	4 „	—	—	„ 18	„ 22	„ 22	Discrete	„	„ 20	30	5	2	—	
115	M. A.	F.	27	—	2 „	—	—	„ 19	„ 22	„ 22	„	„	Feb. 4	45	2	1	No. 125	Said to have had small-pox in childhood.
116	W. T.	M.	20	—	—	*	—	„ 17	„ 23	„ 23	Semi-confluent.	„	„ 4	44	—	—	—	From Holbeck Workhouse.
117	C. W.	M.	34	—	2?	—	—	„ 20	„ 23	„ 23	„	„	„ 11	51	—	—	—	From a lodging-house.
118	T. R.	M.	37	1 good	—	—	—	„ 20	„ 23	„ 24	Discrete	„	Jan. 20	28	—	2	—	
119	L. B.	F.	18	—	—	*	—	„ 18	„ 21	„ 26	Confluent	„	Feb. 21	58	4	4	No. 141	
120	R. A. B.	F.	16	—	2 poor	—	—	„ 9	„ 12	„ 27	Discrete	„	Jan. 20	25	—	1	—	Belongs to same family as No. 119, and discovered when these being removed to Sanatorium on Dec. 27.
121	M. C.	F.	15	—	3 fair	—	—	„ 24	„ 26	„ 27	„	„	Feb. 4	40	3	3	—	
122	M. P.	F.	34	—	—	—	*	„ 24	„ 26	„ 27	„	„	„ 7	43	4	1	—	
123	P. L.	M.	47	2 good	—	—	—	„ 23	„ 27	„ 27	Semi-confluent.	Still in hospital		—	—	—	—	From a lodging-house.
124	J. G.	M.	24	—	1 poor	—	—	„ 26	„ 28	„ 28	Confluent	„ „		—	—	3	—	
125	J. A.	M.	33	—	3 „	—	—	„ 27	„ 29	„ 31	Semi-confluent.	Recovered	Feb. 11	43	—	—	—	*See* 115.
126	A. R.	M.	31	—	—	*	—	„ 27	„ 30	„ 31	Confluent	„	„ 25	57	3	3	—	
127	C. S.	M.	25	—	2 indefinite	—	—	„ 24	„ 27	„ 31	Discrete	„	Jan. 20	21	1	2	—	

LEEDS.—Table of Cases of Small-pox—*continued*.

1893.

No.	Name.	Sex.	Age.	Vaccination.			Not Vaccinated.	Date of			Type of Attack.	Result.	Date of Discharge.	Days in Hospital.	Removed to Sanatorium.			Remarks.
				Good.	Imperfect.	Alleged, but no Marks.		Attack.	Appearance of Rash.	Removal to Hospital.					Males.	Females.	Subsequently Attacked.	
(1.) 128	J. T. H.	M.	22	—	3 poor	—	—	Dec. 31	Jan. 1	Jan. 1	Discrete	Recovered	Feb. 7	38	—	—	—	
(2.) 129	J. B.	M.	26	2 good	—	—	—	„ 31	„ 1	„ 1	„	„	Jan. 27	27	—	—	—	
(3.) 130	T. R.	M.	64	—	—	—	*	„ 29	„ 1	„ 2	„	Died	„ 14	13	—	—	—	
(4.) 131	G. C.	M.	29	—	1 poor	—	—	„ 29	Dec. 31	„ 2	Semi-confluent.	Recovered	Feb. 11	41	—	—	—	
(5.) 132	G. S.	M.	26	—	1 „	—	—	„ 29	Jan. 1	„ 2	Discrete	„	„ 4	34	—	—	—	
(6.) 133	M. E. S.	F.	21	—	—	—	*	„ 28	Dec. 30	„ 2	„ severe	„	Jan. 31	30	—	—	—	
(7.) 134	G. M.	M.	29	1 good	—	—	—	„ 27	Jan. 1	„ 2	Mild	„	„ 24	23	—	—	—	
(8.) 135	C. M.	F.	23	—	2 fair	—	—	„ 6 or 7	Dec. 9	„ 2	„	„	Feb. 4	34	—	—	—	
(9.) 136	E. M.	F.	½	—	—	—	*	„ 26	„ 28	„ 2	Confluent	„	„ 4	34	—	—	—	
(10.) 137	M. E. D.	F.	21	—	3 fair	—	—	„ 29	Jan. 2	„ 3	Mild	„	Jan. 31	29	—	—	—	
(11.) 138	B. D.	F.	50	—	2 „	—	—	„ 30	„ 2	„ 3	Semi-confluent.	„	Feb. 4	33	—	—	—	
(12.) 139	S. D.	F.	19	—	4 poor	—	—	„ 29	Dec. 30	„ 3	Mild	„	Jan. 31	29	—	—	—	
(13.) 140	S. G. O.	F.	11	—	3 „	—	—	Jan. 1	Jan. 3	„ 5	Discrete, severe.	„	„ 31	27	—	—	—	
(14.) 141	A. B.	F.	7	3 good	—	—	—	„ 31	„ 3	„ 6	Mild	„	Feb. 7	33	—	—	—	
(15.) 142	J. R.	M.	25	2 „	—	—	—	Dec. 31	„ 3	„ 6	Discrete	„	„ 4	30	—	—	—	
(16.) 143	K. K.	F.	21	—	—	*	—	Jan. 1–4	„ 8	„ 9	„	„	„ 10	33	—	—	—	
(17.) 144	A. B.	F.	18	—	4 fair	—	—	„ 6	„ 9	„ 10	Mild	„	Jan. 31	22	—	—	—	
(18.) 145	W. B.	M.	22	—	—	—	—	„ 2	„ 8	„ 11	Discrete	„	Feb. 21	42	—	—	—	
(19.) 146	S. W.	F.	38	—	1 fair	—	—	„ 9	„ 12	„ 13	„ severe	„	„ 18	37	—	—	—	
(20.) 147	M. C.	F.	12	3 good	—	—	—	Dec. 21	Dec. 25	„ 13	Mild	„	Jan. 29	8	—	—	—	
(21.) 148	R. C.	F.	11	3 „	—	—	—	Jan. 3	Jan. 6	„ 13	„	„	„ 31	19	—	—	—	
(22.) 149	E. C.	F.	14	4 „	—	—	—	Dec. 6	Dec. 9	„ 13	„	„	„ 20	8	—	—	—	
(23.) 150	H. C.	F.	32	—	1 indefinite	—	—	Jan. 9	Jan. 10 or 11	„ 13	Semi-confluent.	„	Feb. 25	44	—	—	—	
(24.) 151	B. A.	M.	33	2 good	—	—	—	„ 10	„ 11	„ 13	Mild	„	„ 25	44	—	—	—	
(25.) 152	J. W. D.	M.	39	—	2 fair	—	—	„ 8	„ 10	„ 13	„	„	„ 25	44	—	—	—	
(26.) 153	B. V.	M.	38	—	3 „	—	—	„ 10	„ 14	„ 15	Discrete	„	„ 25	42	—	—	—	
(27.) 154	H. S.	M.	21	—	—	*	—	„ 13	„ 16	„ 16	Semi-confluent.	Still in hospital.	—	—	—	—	—	

LEEDS.—Table of Cases of Small-pox, 1893—*continued*.

No.	Name.	Sex.	Age.	Vaccination. Good.	Imperfect.	Alleged, but no Marks.	Not Vaccinated.	Date of Attack.	Date of Appearance of Rash.	Date of Removal to Hospital.	Type of Attack.	Result.	Date of Discharge.	Days in Hospital.	Removed to Sanatorium. Males.	Females.	Subsequently Attacked.	Remarks.
(28.) 155	J. H.	M.	45	—	2 poor	—	—	Jan. 12?	Jan. 12?	Jan. 16	Discrete	Recovered	Feb. 18	34	—	—	—	
(29.) 156	E. T.	M.	24	1 good	—	—	—	„ 11	„ 14	„ 16	Semi-confluent.	„	„ 25	41	—	—	—	
(30.) 157	E. D.	F.	25	2 „	—	—	—	„ 14	„ 17	„ 17	Discrete	„	„ 18	33	—	—	—	
(31.) 158	F. B.	F.	16	—	2 fair	—	—	„ 15	„ 18	„ 18	Mild	„	„ 14	28	—	—	—	
(32.) 159	J. A.	M.	26	—	2 „	—	—	„ 12	„ 14	„ 18	Discrete	„	„ 14	28	—	—	—	
(33.) 160	R. P.	F.	26	—	1 indefinite	—	—	„ 16	„ 16	„ 18	„	„	„ 14	28	—	—	—	
(34.) 161	J. B. T.	M.	17	4 good	—	—	—	„ 15	„ 17	„ 19	„ severe	Still in hospital.		—	—	—	—	
(35.) 162	J. A.	M.	31	2 „	—	—	—	„ 16	„ 19	„ 19	„	Recovered	Feb. 18	31	—	—	—	
(36.) 163	J. H. W.	M.	20	2 „	—	—	—	„ 11	„ 15	„ 19	Mild	„	„ 18	31	—	—	—	
(37.) 164	E. W.	M.	31	—	3 fair	—	—	„ 12	„ 15	„ 19	Discrete	„	„ 18	31	—	—	—	
(38.) 165	E. M.	F	26	—	2 „	—	—	„ 15	„ 18	„ 19	„	„	„ 21	34	—	—	—	
(39.) 166	T. A.	M.	40	—	1 poor	—	—	„ 16	„ 19	19	„	Still in hospital.		—	—	—	—	
(40.) 167	M. W.	F.	34	2 good	—	—	—	„ 17	„ 19-20	„ 20	„	Recovered	Feb. 21	33	—	—	—	
(41.) 168	W. S.	M.	28	—	2 poor	—	—	„ 18	„ 20	„ 20	„	„	„ 21	33	—	—	—	
(42.) 169	W. M.	M.	28	—	3 fair	—	—	„ 16	„ 18	„ 20	„	„	„ 18	30	—	—	—	
(43.) 170	W. H. G.	M.	9	4 good	—	—	—	„ 19	„ 21	„ 21	„	„	„	32	—	—	—	
(44.) 171	C. W.	M.	26	—	2 fair	—	—	—	„ 21	„ 22	„	Still in hospital.		—	—	—	—	
(45.) 172	L. O.	F.	29	—	2 poor	—	—	Jan. 17	„ 20	„ 24	„ severe	Recovered	Feb. 21	29	—	—	—	
(46.) 173	C. K.	M.	28	—	2 „	—	—	„ 21	„ 23	„ 24	Semi-confluent.	Still in hospital.		—	—	—	—	
(47.) 174	M. E.	F.	29	—	3 fair	—	—	„ 21	„ 22	„ 24	Discrete	„		—	—	—	—	
(48.) 175	K. P.	F.	21	—	2 poor	—	—	„ 20	„ 22	„ 24	„ severe	„		—	—	—	—	
(49.) 176	J. D.	M.	20	No information.			—	„ 21	„ 23	„ 25	„	Recovered	Feb. 25	32	—	—	—	
(50.) 177	M. J.	F.	27	—	1 indefinite	—	—	„ 21	„ 23	„ 25	„ severe	„	„ 25	32	—	—	—	
(51.) 178	A. H.	M.	29	—	2 poor	—	—	„ 20	„ 23	„ 26	„	„	„ 25	31	—	—	—	
(52.) 179	A. B.	...	20	—	3	—	—	„ 19	„ 22	„ 27	„	„	„ 21	26	—	—	—	
(53.) 180	H. B.	M.	19	—	1 poor?	—	—	„ 23	„ 25	„ 26	Confluent	Still in hospital.		—	—	—	—	
(54.) 181	A. F. T.	F.	35	—	—	—	—	„ 25?	„ 26?	„ 28	„	Died	Feb. 1	5	—	—	—	
(55.) 182	W. A. D.	M.	4	—	—	—	—	—	—	„ 28	„	Still in hospital.		—	—	—	—	
(56.) 183	A. R. D.	F.	15	—	1 fair, 1 poor	—	—	Jan. 22	Jan. 25	„ 28	Mild	„		—	—	—	—	

LEEDS.—Table of Cases of Small-pox, 1893—*continued*.

No.	Name.	Sex.	Age.	Vaccination.			Not Vaccinated.	Date of			Type of Attack.	Result.	Date of Discharge.	Days in Hospital.	Removed to Sanatorium.			Remarks.
				Good.	Imperfect.	Alleged, but no Marks.		Attack.	Appearance of Rash.	Removal to Hospital.					Males.	Females.	Subsequently Attacked.	
(57.)	184	S. T.	F.	24	—	—	—	—	Jan. 23	Jan. 25-26	Jan. 30	Abortive	Still in hospital.		—	—	—	—	
(58.)	185	T. H.	M.	24	—	4 fair	—	—	„ 25	„ 26	„ 30	Discrete	„		—	—	—	—	
(59.)	186	T. P.	M.	25	3 good	—	—	—	„ 25	„ 26	„ 30	„	„		—	—	—	—	
(60.)	187	T. S.	M.	39	—	Indefinite	—	—	„ 29	„ 30	„ 31	Semi-confluent.	„		—	—	—	—	
(61.)	188	H. S.	F.	19	—	2 poor	—	—	„ 4	„ 6	„ 31	Discrete	Recovered	Feb. 18	19	—	—	—	
(62.)	189	S. S.	M.	15	—	3 fair	—	—	—	—	„ 31	Mild	„	„ 25	26	—	—	—	
(63.)	190	D. S.	M.	24	—	3 „	—	—	Jan. 23?	Jan. 28	„ 31	„	„	„ 21	22	—	—	—	
(64.)	191	C. S.	M.	21	—	2 poor	—	—	„ 19	„ 22	„ 31	„	„	„ 21	22	—	—	—	
(65.)	192	S. J. H.	F.	19	3 good	—	—	—	„ 27	„ 30	„ 31	Discrete severe.	Still in hospital.		—	—	—	—	
(66.)	193	O. A.	M.	25	—	—	—	—	„ 28	„ 30	„ 1	Confluent	Died	Feb. 8	8	—	—	—	
(67.)	194	A. H.	F.	19	4 good	—	—	—	„ 24	Feb. 25	„ 1	Discrete	Still in hospital.	—	—	—	—	—	
(68.)	195	M. O.	F.	13	—	2 fair, 1 poor	—	—	„ 29 (?)	„ 1	„ 1	„	„	—	—	—	—	—	
(69.)	196	M. T. W.	F.	24	2 good	—	—	—	„ 30	„ 3	„ 2	„ severe	„	—	—	—	—	—	
(70.)	197	T. R.	M.	30	1 „	1 fair	—	—	„ 29	„ 2	„ 3	„	„	—	—	—	—	—	
(71.)	198	A. O.	F.	34	—	3 poor	—	—	„ 28 (?)	„ 2	„ 4	„	„	—	—	—	—	—	
(72.)	199	J. H.	M.	22	—	1 „	—	—	Feb. 2	„ 3	„ 4	„	„	—	—	—	—	—	
(73.)	200	W. G.	M.	30	—	1 fair, 1 poor	—	—	Jan. 31	„ 1	„ 4	„ severe	„	—	—	—	—	—	

APPENDIX X.

ANALYSIS OF CASES OF SMALL-POX (1892–93) WITH REGARD TO THE TYPE OF THE DISEASE AND THE CHARACTER OF VACCINATION.

Vaccinated Class.—Number and Quality of Marks.

I.—"GOOD" MARKS.

	Mild.				Discrete.				Semi-confluent.				Confluent.				Total.			
	1.	2.	3.	4.	1.	2.	3.	4.	1.	2.	3.	4.	1.	2.	3.	4.	1.	2.	3.	4.
1 year	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1–5 „	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5–10 „	—	—	1	—	—	—	1	1	—	—	—	—	—	—	—	—	—	—	2	1
10–15 „	—	1	3	2	—	—	1	—	—	—	—	—	—	—	—	—	—	1	4	2
15–20 „	—	—	—	2	—	2	1	3	—	—	—	—	—	—	—	—	—	2	1	5
20–30 „	1	3	2	2	—	11	1	2	2	—	1	—	—	1	1	—	3	15	5	4
30–40 „	—	1	3	—	1	6	—	—	—	1	1	—	—	—	1	—	1	8	5	—
40–50 „	—	—	—	—	—	—	—	—	—	2	—	—	—	—	—	—	—	2	—	—
50–60 „	—	—	—	—	—	—	—	1	—	—	1	—	—	—	—	—	—	—	1	1
60–70 „	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—
	2	5	9	6	1	19	4	7	2	3	3	—	—	1	2	—	5	28	18	13

II.—"FAIR" MARKS.

	Mild.				Discrete.				Semi-confluent.				Confluent.				Total.			
	1.	2.	3.	4.	1.	2.	3.	4.	1.	2.	3.	4.	1.	2.	3.	4.	1.	2.	3.	4.
1 year	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1–5 „	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5–10 „	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	1	—	—
10–15 „	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
15–20 „	—	1	1	1	—	—		—	—	—	—	—	—	—	—	—	—	1	2	1
20–30 „	—	3	2	—	—	3		2	—	—	—	—	—	—	—	—	—	6	4	2
30–40 „	—	2	—	—	1	2	2	—	—	—	—	—	—	2	—	—	1	6	2	—
40–50 „	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	1	—
50–60 „	—	—	—	—	—	1	—	—	—	1	—	—	—	—	—	—	—	2	—	—
60–70 „	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	—	6	3	1	1	7	5	2	—	1	1	—	—	2	—	—	1	16	9	3

III.—"BAD" AND "POOR" MARKS.

	Mild.				Discrete.				Semi-confluent.				Confluent.				Total.			
	1.	2.	3.	4.	1.	2.	3.	4.	1.	2.	3.	4.	1.	2.	3.	4.	1.	2.	3.	4.
1 year	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1–5 „	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5–10 „	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
10–15 „	—	—	—	—	—	—	2	—	—	—	—	—	—	—	—	—	—	—	2	—
15–20 „	—	2	—	1	—	3	—	—	—	—	—	—	1	1	—	—	1	6	—	1
20–30 „	1	2	—	1	3	9	3	—	1	2	—	—	1	—	—	—	6	13	3	1
30–40 „	1	1	—	—	—	5	2	1	2	2	1	—	1	1	1	—	4	9	4	1
40–50 „	—	—	—	—	1	4	—	—	—	—	—	—	—	1	—	—	1	5	—	—
50–60 „	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	1	—	—
60–70 „	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	2	5	—	2	4	21	7	1	3	4	1	—	3	4	1	—	12	34	9	3

LEEDS.

IV.—MARKS NOT STATED.

——	Mild.	Semi-confluent.	Total.
15-20 years	1	—	1
20-30 „	1	—	1
30-40 „	—	1	1
	2	1	3

TOTAL VACCINATED.

Class.	Mild.	Discrete.	Semi-confluent.	Confluent.	Total.
I.	22	31	8	3	64
II.	10	15	2	2	29
III.	9	33	8	8	58
IV.	2	—	1	—	3
	43	79	19	13	154

VACCINATION ALLEGED, BUT NO EVIDENCE.

——	Mild.	Discrete.	Semi-confluent.	Confluent.	Total.
5-10 years	—	—	—	1	1
10-15 „	—	1	—	—	1
15-20 „	—	—	—	2	2
20-30 „	1	2	2	3	8
30-40 „	1	—	1	2	4
40-50 „	—	—	2	—	2
50-60 „	—	—	—	—	—
60-70 „	1	—	—	—	1
	3	3	5	8	19

VACCINATION DOUBTFUL.

——	Discrete.	Semi-confluent.	Total.
15 to 20 years	1	—	1
20-30 „	2	1	3
	3	1	4

"UNDER" VACCINATION.

——	Mild.
Under 1 year	1
„ 5 to 10 years	1
„ 10 to 20 „	1
	3

UNVACCINATED.

——	Mild.	Discrete.	Semi-confluent.	Type not stated.	Confluent.	Total.
Under 1 year	—	—	—	2	1	3
1-5 years	—	—	1	2	—	3
5-10 „	—	—	—	2	—	2
10-15 „	—	—	—	1	—	1
15-20 „	—	—	—	—	—	—
20-30 „	—	1	1	4	—	6
30-40 „	—	1	—	1	—	2
40-50 „	—	—	—	1	—	1
50-60 „	—	—	—	—	1	1
60-70 „	—	1	—	—	—	1
	—	3	2	13	2	20

APPENDIX XI.

FATAL CASES OF SMALL-POX, 1892–93.

—	Vaccinated.	Alleged Vaccination.	Unvaccinated.
Under 1 year	Nil.	Nil.	*Nos. 6, 89.*
1 to 5 years	Nil.	Nil.	*No. 88.*
5-10 „	Nil.	Nil.	Nil.
10-15 „	Nil.	Nil.	Nil.
15-20 „	Nil.	Nil.	Nil.
20-30 „	Nil.	*No. 193.*	*Nos. 53, 102.*
30-40 „	*Nos. 95, 99.*	*No. 181.*	Nil.
40-50 „	Nil.	Nil.	Nil.
50-60 „	Nil.	Nil.	*No. 36.*
60-70 „	Nil.	Nil.	*No. 180.*
	2 cases.	2 cases.	7 cases.

APPENDIX XII.

LEEDS UNION.

VACCINATION RETURNS, 1872-1892.

Year.	Births registered during Year.	Of the children whose Births were registered during the Year given in the First Column, by the 31st January in the year next but one following that year there were:						
		Successfully vaccinated.	Certified as insusceptible of Vaccination.	Had Small-pox.	Died unvaccinated.	Vaccination postponed by Medical Certificate.	Remaining.	The Children not finally accounted for (including cases postponed) being per cent. of Births.
1872	6,707	5,779	5	5	835	83		1·2
1873	6,867	5,954	2	1	825	13	72	1·2
1874	7,121	6,197	4	0	819	9	92	1·4
1875	6,955	5,976	2	1	866	15	95	1·6
1876	7,355	6,440	1	0	805	18	91	1·5
1877	7,244	6,443	0	0	688	10	103	1·6
1878	7,183	6,237	4	0	809	12	121	1·9
1879	6,914	6,135	2	0	650	13	114	1·8
1880	6,775	6,033	4	0	663	2	73	1·1
1881	6,829	6,202	4	0	525	6	92	1·4
1882	6,631	5,914	2	0	616	9	90	1·5
1883	6,656	5,915	8	0	633	13	87	1·5
1884	6,567	5,845	9	0	627	10	76	1·3
1885	6,770	6,139	4	0	508	10	109	1·8
1886	6,869	6,167	7	0	552	16	127	2·1
1887	6,866	5,949	8	0	624	33	152	4·2
1888	6,861	5,798	26	0	698	49	290	4·9
1889	6,969	5,819	11	0	739	51	349	5·7
1890	7,185	6,084	21	0	712	40	328	5·1
1891	7,396	6,158	30	0	804	43	361	5·5
1892	7,460	6,261	21	0	764	57	357	5·5

VII.—Report on the Prevalence of Small-pox at Sheffield, 1892-93.

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§ 1. *Sanitary Administration of Sheffield.*

The exhaustive Report made by Dr. Barry on behalf of the Local Government Board upon the epidemic of small-pox at Sheffield during 1887–88 renders it superfluous for me to review the zymotic history of the city. I propose, therefore, to describe at once the sanitary administration, relegating to the Appendix certain statistics of population, &c., which are based on the figures yielded by the Census of 1891, and are therefore subsequent to Dr. Barry's Report (*See Appendix I.*).

Sanitary authority.

The control of sanitation at Sheffield is vested in the Health Committee and the Borough Hospitals Committee of the Town Council. The Medical Officer of Health is Harvey Littlejohn, M.A., M.B., B.Sc.Ed., who was appointed in June 1891. He has the entire charge of the Sanitary Department, the offices of which are in North Church Street. The nine registration sub-districts into which Sheffield is divided (Sheffield West, North, South, Park, Brightside, Attercliffe, Nether Hallam, Upper Hallam, and Ecclesall) are not conterminous with the sanitary districts, of which there

Sanitary districts.

are eight, arranged according to the density of population. The staff consists of 11 Nuisance Inspectors, 2 Smoke Inspectors, 1 Meat Inspector, 1 Dairy and Cowshed Inspector, and 2 clerks.

Duties of district inspectors.

The Nuisance Inspectors comprise 8 District Inspectors, and three others whose duties are concerned with house sanitation, the supervision of canal boats, and of houses let in lodgings. The duties of the District Inspector consist very largely in carrying out the instructions of the Medical Officer with respect to cases of infectious disease in his district.

The Health Office is in direct telephonic communication with the Borough Hospitals at Winter Street and Lodge Moor, which are similarly connected with each other.

Notification.

Compulsory notification of infectious diseases has been in force since the passing of the Act, that is since November 1889, prior to which date there had been for some time a system of voluntary notification by medical men, for which fees were paid by the authorities. On receipt of a notification, the Medical Officer marks on his map the place indicated, and the notification, after entry in the register, is handed to the Inspector of the District. If there are any special points to be noted the Medical Officer acquaints the Inspector with them. [As a general rule the Inspectors receive their instructions in the morning when they attend at the office to hand in their reports of the previous day upon the houses visited, the removals to hospital, the measures of disinfection &c., that have been carried out.]

On receipt of their instructions, the Inspectors proceed to the houses concerned, and enter full details in their books and on forms supplied for the purpose (*see Appendix II.*). It will be seen that the form not only permits of the record of particulars about the case, but also of many other points concerning the house and its inmates. These forms are filed for future reference, and serve as records of each case. If the case be one of fever, and the consent of the patient is obtained, he is removed to the hospital in Winter Street, whence the ambulance is despatched to fetch the case. The bedding, clothes, &c., are removed for disinfection, and the house fumigated by the Inspector. If the case be not removed, but isolated at home, it is the duty of the Inspector to instruct the inmates as to the special precautions to be taken, and to continue to visit the house from time to time to see if these are carried out. On the recovery of the patient he has to undertake the disinfection of the house.

In his Annual Report for 1891, Dr. Littlejohn makes the following remarks upon this portion,—the major portion,—of an Inspector's work :—

> "The Notification Act is of great value to Health Authorities in many ways, and in none more so than in bringing under the notice of the Inspectors defects in the sanitary arrangements of the dwellings where cases of infectious disease have occurred; but it can easily be understood that the carrying out of the above duties in regard to each case involves a considerable amount of time, and frequently encroaches largely upon the Inspectors' duties in connexion with the investigation of nuisances."

He adds, that it is therefore impossible with the present staff to carry out a regular system of house-to-house inspection.

The Borough Hospital, Winter Street, of which Dr. Gould is the Medical Superintendent, is devoted to the reception of cases of fever, and until small-pox re-appeared in 1892 Lodge Moor Hospital was also entirely given up to that same purpose. The hospital at Lodge Moor was erected during the epidemic in 1887–88 for the reception of cases of small-pox. It is fully described by Dr. Barry in his Report,* and remains now practically the same as at the time of its erection. Steps are, however, being taken to gradually convert it into a permanent building. Thus, the area on which it stands is being enclosed by a stone wall, a permanent lodge is in course of erection, and in the central quadrangle a laundry is being constructed. Owing to its exposed situation, the original building shows evidence of wear and tear, but recently the pavilions and corridors on the north side have had their walls lined by a composition, adding greatly to the comfort of the wards, and giving a greater appearance of permanency.

I visited Lodge Moor on February 11th with Dr. Littlejohn and was shown over the buildings by Dr. Gould, the Medical Superintendent of Winter Street Hospital (who has also general supervision over Lodge Moor), and by Dr. Caley the resident medical officer of Lodge Moor. I am much indebted to these gentlemen for their courtesy and for much information concerning the hospital, and the cases of small-pox that have been admitted there.

When with the subsidence of the 1888 epidemic the hospital was no longer required for the reception of small-pox cases, for which it was originally established, it was kept closed for some months. It then became gradually devoted to the reception of cases of scarlet fever in the convalescent stage, which were drafted from Winter Street to the relief of that institution, and greatly to the benefit of the health of the children. The numbers sent to Lodge Moor increased year by year, until most of the nine wards available for patients (three on the north side being utilised for administration) were occupied. A sufficient staff was retained there, and opportunity was taken to send nurses from Winter Street who needed the benefit of the change of air on the uplands. The reversion of some of the wards to their primary purpose on the outbreak of small-pox last year will be described in connexion with the account of that outbreak.

§ 2. *Vaccination at Sheffield.*

I am obliged to Mr. T. W. Smith, clerk to the Guardians of the Ecclesall Bierlow Union, for the statistics of the vaccination officers for the districts of that Union for the year 1891, and the first six months of 1892. The full returns will be found in Appendix III. In 1891, the number of births registered was 4,834, the number of these returned as successfully vaccinated was 4,007, as "insusceptible" 36, as having died unvaccinated 518. Thirty-two were postponed by medical certificate, 72 had removed to other districts, 155 to places unknown, and 14 "unaccounted for." During the months January to June 1892, of 2,248 births, 1,813 were successfully vaccinated, 15 "insusceptible," 236 had died unvaccinated, 34 postponed on medical certificate, 36 had removed to other districts, 97 to places unknown, and 17 were "unaccounted for."

Thus excluding the "deaths unvaccinated," the per-centage among those born during those 18 months is:—

Total births	7,082	
Died unvaccinated	754	
	6,328	
Successfully vaccinated	5,820	or 92 per cent.
Insusceptible	51	or 0·8 ,, ,,
Postponed	66	or 1·0 ,, ,,
Removals	360	or 5·6 ,, ,,
Unaccounted for	31	or 0·5 ,, ,,

3. *Small-pox at Sheffield, 1892–93.*

Since the epidemic of small-pox experienced by Sheffield in 1887–88, when it was estimated that 22·2 per 1,000 of the population were attacked, the deaths amounting to 2·07 per 1,000 living, Sheffield has been free from the disease until March 1892, and since that date to the present time (February 11th, 1893) there have been 60 cases reported to the sanitary authority. This comparative paucity of cases in a large industrial centre, and in a county where small-pox has prevailed for the past two years is noteworthy. Apart from the efficacy of the measures adopted in dealing with cases as they arise, the influence of which in limiting the spread of the disease, has, I think, been considerable, it may not unreasonably be also attributed to the fact that a considerable proportion of the population at ages most liable to infection, have been protected by a previous attack five years ago, not to mention the much greater number who resorted to re-vaccination during that period (Table I.).

SHEFFIELD.

TABLE I.

Small-pox at Sheffield, 1892–93.

	Cases notified.	Cases arising.	Died.
1892.			
Week ending—March 26	—	1	—
April 2	1	—	—
,, 9	—	—	—
,, 16	—	—	—
,, 23	—	—	—
,, 30	1	2	—
May 7	2	3	—
,, 14	2	2	—
,, 21	2	—	—
,, 28	—	—	—
June 4	2	2	—
,, 11	—	—	—
,, 18	—	—	—
,, 25	—	1	—
July 2	2	1	—
,, 9	—	—	—
,, 16	2	4	1
,, 23	—	3	—
,, 30	11	7	1
August 6	1	—	—
,, 13	5	5	—
,, 20	—	1	—
,, 27	2	1	—
September 3	—	—	—
,, 10	—	—	—
,, 17	—	—	—
,, 24	—	1	—
October 1	1	—	—
,, 8	—	1	—
,, 15	1	—	—
,, 22	—	—	—
,, 29	—	3	1
November 5	4	1	—
,, 12	1	1	—
,, 19	—	—	—
,, 26	2	2	—
December 3	—	—	—
,, 10	—	1	—
,, 17	2	1	—
,, 24	—	1	—
,, 31	3	2	—
1893.			
January 7	1	1	—
,, 14	2	3	—
,, 21	2	2	—
,, 28	2	3	—
February 4	4	4	—
,, 11	2	—	—
Total	60	60	3*

* Report of an Epidemic of Small-pox at Sheffield during 1887–88. By Dr. Barry, p. 269.

SHEFFIELD.

Dr. Littlejohn kindly furnished me with details concerning every case. In many he was enabled to trace with fair accuracy the source of infection, and I propose briefly to pass them in review since the record is instructive. He has also furnished me with a map on which each case is indicated by the number under which it appears in the table in Appendix IV.

History of outbreak.

The first case was notified on March 31st 1892. The patient was a man who was engaged at work at Stocksbridge, where small-pox was then prevalent. He had a very mild attack (varioloid). A month later another case was notified, a young woman, E. L., whose father and brother were also engaged at work at Stocksbridge, and who may have been the medium of her infection. No. 3, notified on May 2nd, was found by Dr. Littlejohn to have a well developed rash, which had appeared on April 28th. This patient, J. S., may possibly have contracted the disease at Stocksbridge, where he had been attending some football matches, this being at that time the only place in the vicinity of Sheffield where small-pox was prevalent. He seems to have conveyed the infection to his sister, A. S., for she sickened on the day of her removal—with other members of the family—to quarantine; and what is equally significant in respect to the transmission of the contagion, she must have been the medium of infection (*before* she herself was attacked) to her fellow workers in a factory (Nos. 6 to 10) who were attacked from May 3rd to May 31. Meanwhile another imported case had occurred in a man of roving habits, who arrived at his home in Sheffield 10 days before he fell ill. He had spent two nights in a common lodging house at Liverpool, having landed there from Brazil. In his case (No. 5) the rash had been out for two days before he was discovered. No second case occurred in the house, from which one inmate was removed to quarantine.

At the end of June two cases were notified (Nos. 11 and 12). In each of these cases the source of infection was doubtful, the only possible clue to the former being that he had been lodging with a dealer in cast-off clothing. He had a confluent attack, and on the 14th day of his removal to hospital his wife also sickened (No. 13). The next case, a fatal one (No. 14), was that of a man who had been in a lodging house at Chesterfield, and who was taken ill in a common lodging house in the centre of Sheffield. From this case, which was removed on the day that the rash appeared, five others arose. J. T. (No. 23), an inmate of the lodging house, fell ill on July 28th, the 14th day of No. 14's removal. This case too was a fatal one. No. 21 attended in a shop attached to the lodging house, and was attacked on July 26th. She was being looked after by a woman (No. 31), when Dr. Littlejohn visited the house, and this person herself was attacked on August 8th. No. 22 was a little girl who carried fish to the lodging house on Sundays, and No. 26 was an inmate of a lodging house exactly opposite to that in which the other cases had occurred. He had, however, 9 days before, been an inmate of the latter house, and 16 days before had been in Chesterfield (he is a travelling photographer) where he *may* have contracted the disease. He fell ill on July 29th, and his case was not discovered until after the rash had been fully developed. The source of infection of the next case notified (August 8th) is not known. She and her husband lived in Canning St.; they had no family, and when she was feeling unwell she went to her mother's house in Petre St., whence she was taken to the hospital. On August 12, a case was notified from Marcus St., a female 20 years of age, who had been taken ill on the 7th. Dr. Littlejohn found that her brother (E. H. No. 30) also presented an eruption, and it seemed probable that he had been himself infected at Brigg, and had brought the contagion home with him. He was employed at some iron-works, where there were 150 hands, and although he was at work with the rash out no other case occurred among his fellow workers. Two cases notified from the same house on August 22nd, were somewhat similar in their relations to Nos. 29 and 30. Thus J. G. (No. 33) had, on the 6th, been in camp with the militia at Strensall, where small-pox was then spreading. He slept in lodging houses at Halifax on the 7th, Huddersfield on the 8th, and in Sheffield on the 9th to 10th. M. W., a girl age 9, is his stepsister, and he may have come in contact with her on the 9th. She sickened on the 21st, he on the 20th.

There was only one case in September, viz. J. F. (No. 34), who had been employed on the Ship Canal works at Runcorn until the 17th, and had come to Sheffield through Oldham. He fell ill on the 24th, and was removed to hospital on the 27th. The next case, W. W. (No. 35), had apparently contracted small-pox from a fellow miner in whose family there were cases of the disease. He himself lived in a crowded neighbourhood on the outskirts of the borough, but no other case followed his removal. On November 1st three cases were notified from a common lodging house in New Street. They were all attacked within the three days October 26 to 28, and it was surmised that the disease was imported by No. 37, an unvaccinated child, who had been in a model lodging house at Barnsley a fortnight before. No. 36 was the son of the New Street lodging house keeper, whilst No. 38—a fatal case—also inhabiting the same house, may either have contracted small-pox from the same source, or at Chapel-en-le-Firth where she had recently been. On November 3rd was notified the case of A. E., a dealer in clothing, whose shop had been visited by customers from Handsworth, who came for the purpose of purchasing mourning for relatives who had died of small-pox. J. D., a navvy, was removed on November 7th; he had probably been infected at Chesterfield, where he worked. A case notified on the 22nd (No. 41) could not be traced to any antecedent one. A. W. (No. 43), in a common lodging house (whence also came Nos. 46, 47, 49, and 50) may have contracted the disease at Leeds; Nos. 46 and 47 at Totley; whilst Nos. 49 and 50 were possibly infected by one or other of these. The first to be attacked was A. W. (No. 43), notified on December 13th, the last being notified exactly a month later, January 12th. Besides these a mason employed in the erection of the wall at Lodge Moor fell ill on November 22nd (No. 42); he said that he had not been in contact with any one connected with the small-pox hospital. He lived at Ringinglowe, and 18 days after he had been removed to the hospital, another case (No. 44) was notified from the same place. E. S. (No. 44) lived opposite to J. U. (No. 42), and had not come in contact with him, to her knowledge, but she must have fallen ill about 14 days after his removal. No other cases occurred in Ringinglowe. No clue could be obtained to the origin of the case of E. L. (No. 45), living in Burgoyne Road. She was an unvaccinated child who was attacked on December 22nd, and sent to Lodge Moor on the 26th together with six members of her family, one of whom, who had been vaccinated there, was attacked on January 3rd.

P. R. (No. 51), a shopkeeper in South Road, may have contracted small-pox at Hathersage where he attended every week. He had the eruption full out when attending to his shop. A. H. (No. 52) was a young woman who had been living for the past three weeks at Whittington Moor, and when she arrived in Sheffield as a nurse in a private house she already presented a rash. Of the rest, cases Nos. 53, 55, and 56 could not be traced, No. 54 may have been infected in Bradford or Halifax, and may have infected No. 58 lodging in the same house. The latter, however, had been staying at Chesterfield, and may have been infected there. Two cases came from the workhouse, one (No. 57) on February 9th, having been in the workhouse for 10 days, the other on February 7th, who had been an inmate (No. 60) since January 20th, and was possibly infected by No. 50, or by No. 57.

Of the total number of 60 cases, 35 were males, and 25 females. Of the former 25 were discharged recovered, 2 died, and 8 remained in the hospital at the time of my visit; of the latter 22 were discharged recovered, 1 died, and 2 remained under treatment. It will be seen from the following table (Table II.), that there were no cases under 5 years of age, only 4 from 5 years to 10, and 5 from 10 to 15; 45 of the cases were between the ages of 15 and 40.

SHEFFIELD, SMALL POX 1892-93.

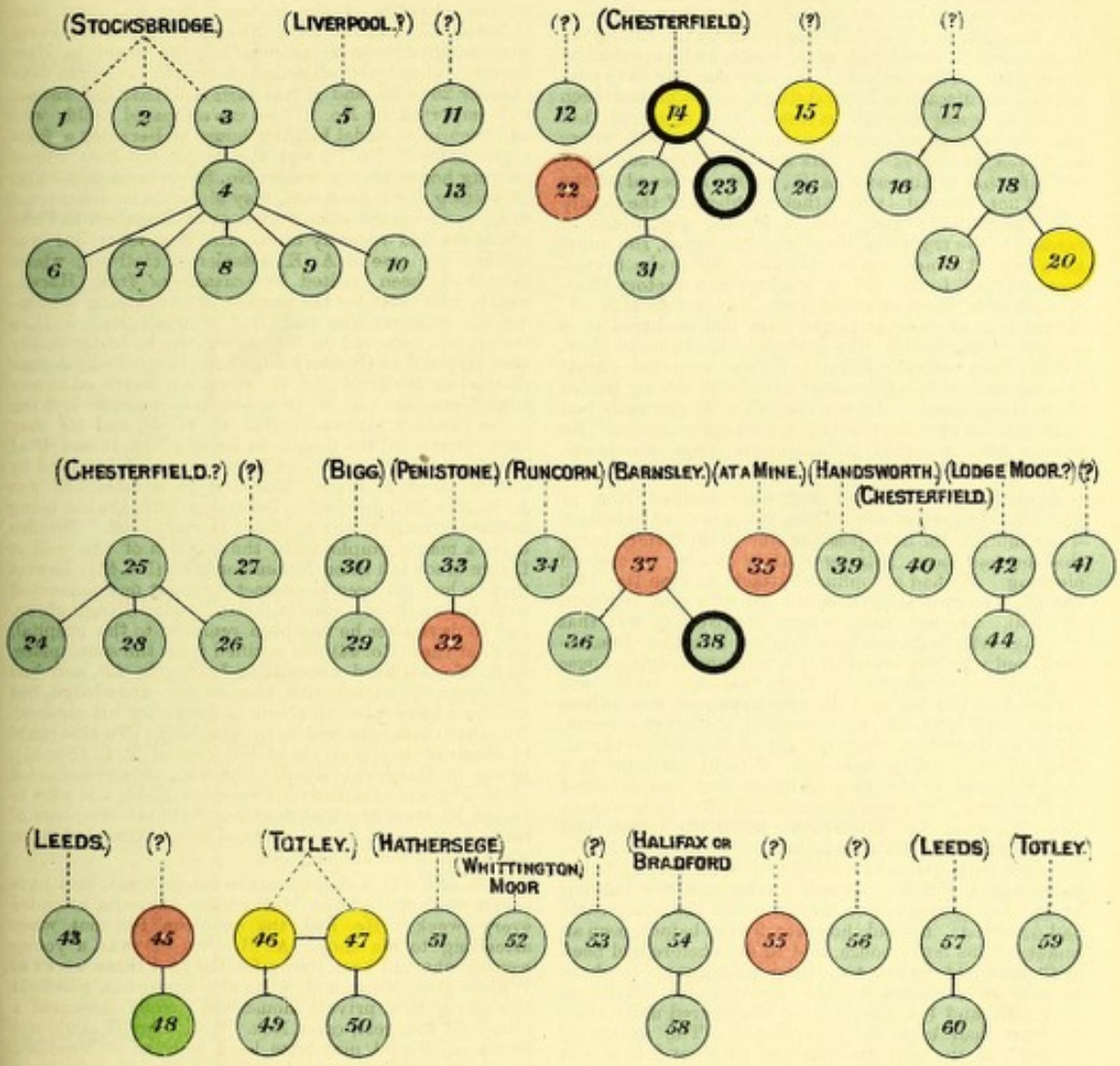

Diagram to Illustrate Vaccination-condition and the apparent connection between the cases of Small Pox which occurred in Sheffield from March 1892 to February 7th 1893. The probable source of infection is indicated.

Numerals refer to Table of Cases in Appendix IV.

Vaccinated
Unvaccinated
Vaccination alleged but no visible marks.
"Under" Vaccination

Fatal Cases indicated by thick black border.

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TABLE II.

Sheffield, 1892-93 :—*Small-pox Cases.—Age, Sex, Mortality.*

	Males.			Females.			Both Sexes.			Total.
	Recovered.	Died.	In Hospital.	Recovered.	Died.	In Hospital.	Recovered.	Died.	In Hospital.	
5–10 years	—	—	1	3	—	—	3	—	1	4
10–15 years	1	—	—	4	—	—	5	—	—	5
15–20 years	4	—	—	6	—	—	10	—	—	10
20–30 years	11	1	2	6	1	2	17	2	4	23
30–40 years	5	1	4	2	—	—	7	1	4	12
40–50 years	1	—	—	1	—	—	2	—	—	2
50–60 years	2	—	—	—	—	—	2	—	—	2
60–70 years	1	—	1	—	—	—	1	—	1	2
Total	25	2	8	22	1	2	47	3	10	60

TABLE III.

Sheffield, 1892-93 :—*Cases of Small-pox—Vaccination Statistics.*

	Years of Age. 5–10.	10–15.	15–20.	20–30.	30–40.	40–50.	50–60.	60–70.	Total.
Vaccinated	1	2	10	22	9	1	1	2	48
Alleged vaccination	—	—	—	—	3	1	1	—	5
"Under" vaccination	1	—	—	—	—	—	—	—	1
Unvaccinated	2	3	—	1	—	—	—	—	6
Total	4	5	10	23	12	2	2	2	60

The above table includes all the cases: the three that are fatal comprise two of the "vaccinated" series between the ages of 20 and 30 years, and one of these stated to have been vaccinated, but having no evidence of it, between 30 and 40 years of age.

Dr. Caley has kindly supplied me with a more detailed analysis of the cases treated at Lodge Moor during 1892 (see Appendix V.). To the list of those coming from Sheffield I have added the cases admitted during 1893—the only other change being the exclusion of the group of those "under 15 years of age" of two patients aged 15 years.

SHEFFIELD.

TABLE IV.

Type of Attack, Age, and Vaccination.

Degree of Vaccination.	Under 15 Years of Age.								15 Years of Age and over.									
	Varioloid.		Discrete.		Coherent.		Confluent.		Varioloid.		Discrete.		Coherent.		Confluent.			
	Total.	Deaths.	Total.	Deaths.	Total.	Deaths.	Total.	Deaths.	Total.	Deaths.	Total.	Deaths.	Total.	Deaths.	Total.	Deaths.	Total.	Deaths.
Unvaccinated	—	—	1	—	2	—	2	—	—	—	—	—	—	—	1	—	6	—
Alleged vaccination, no marks	—	—	—	—	—	—	—	—	2	—	—	—	—	—	3	1	5	1
"Under" vaccination	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	1	—
1 bad mark	—	—	—	—	—	—	—	—	—	—		—	—	—	1	—	2	—
2 bad marks	—	—	—	—	—	—	—	—	2	—	4	—	1	—	—	—	7	—
3 bad marks	—	—	—	—	—	—	—	—	4	—	2	—	2	—	1	1	9	1
4 bad marks and more	—	—	—	—	—	—	—	—	1	—	1	—	1	—	1	—	4	—
1 good mark	—	—	—	—	—	—	—	—	2	—	2	—	—	—	—	—	4	—
2 good marks	1	—	—	—	—	—	—	—	1	—	2	—	—	—	1	—	5	—
3 good marks	—	—	—	—	—	—	—	—	3	—	4	—	1	—	—	—	8	—
4 good marks and over	2	—	—	—	—	—	—	—	5	—	1	—	—	—	1	1	9	1
Total	3	—	1	—	3	—	2	—	20	—	17	—	5	—	9	3	60	3

Type of disease.

The study of this table shows that of those who were *under 15 years of age*, nine in number, the three who were vaccinated and presented "good" marks were all varioloid attacks, the five who were unvaccinated were cases of a severe type, one only having a discrete eruption, two a coherent, and two a confluent rash. One child (No. 48) aged eight years, was vaccinated (in quarantine) a week before she was attacked with small-pox; her attack was a severe (coherent) one. There were no deaths among those under 15 years of age. Of the 51 patients *aged 15 years and over*, no fewer than 20 had mild (varioloid) attacks; 11 of these showed "good" marks varying from one to five, seven had "bad" marks, and two were said to have been vaccinated, but had no marks. There were 17 discrete cases, nine with "good," and eight with "bad" marks. Of the five coherent attacks, only one was in a patient having "good" marks, whilst of the nine confluent cases, one was unvaccinated, three were said to have been vaccinated but had no marks, three showed "bad," and two had "good" marks. The deaths were three in number:—(1) No. 14, a navvy, 30 years of age, who was said to have been vaccinated, but had no marks; (2) No. 38, a female 24 years of age, whose three vaccination marks were "faint"; (3) No. 23, a navvy, 28 years of age, who not only had four good marks of primary vaccination, but who, having been in the army, was also thought to have been re-vaccinated; there was, however, no evidence of this.

Measures taken by health officer.

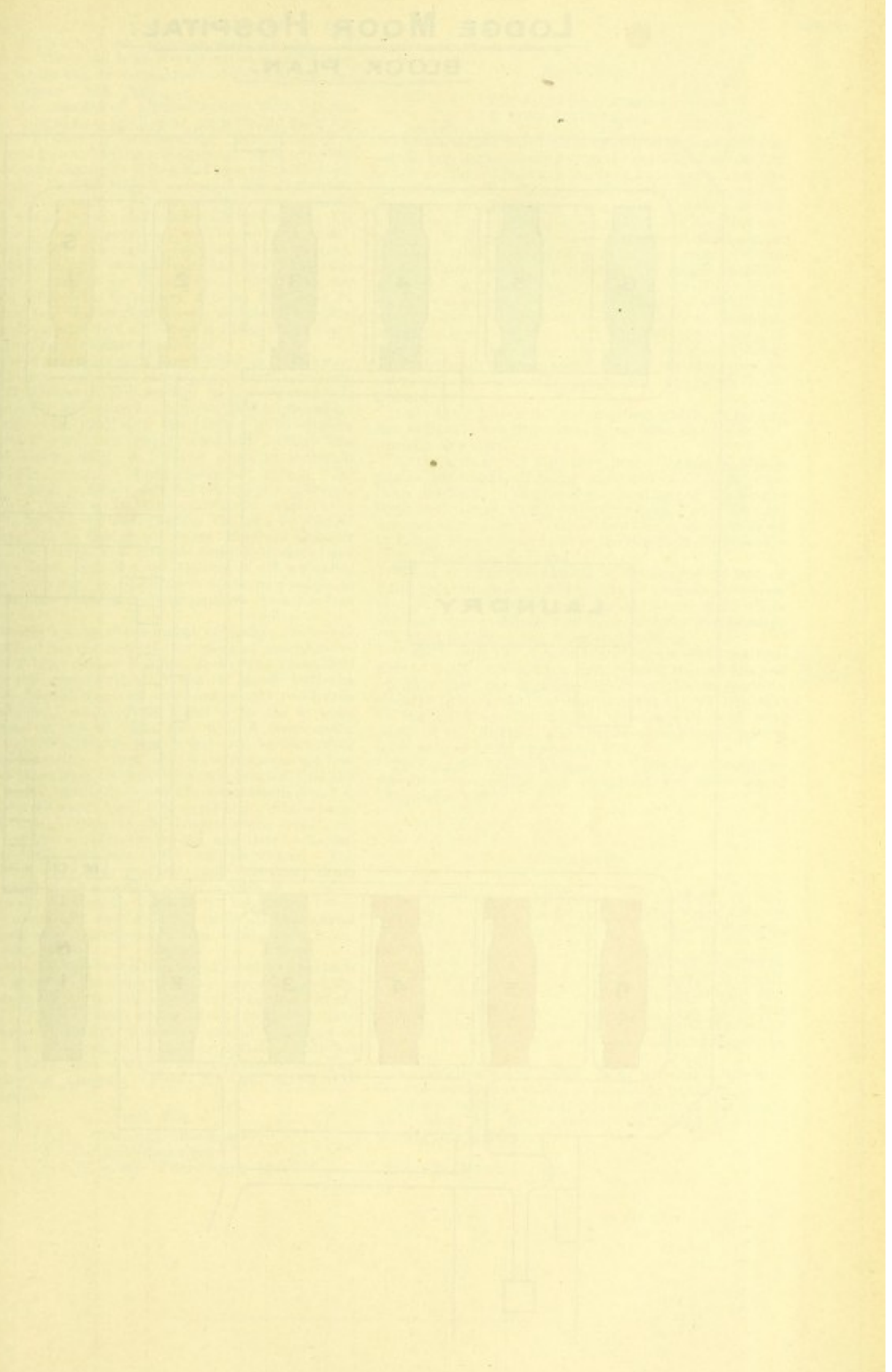
The procedure adopted in dealing with cases of small-pox follows the lines of that described above with respect to infectious disease in general, with certain important additions. Thus the Medical Officer of Health has made a point of personally visiting every notified case, and in that way has sometimes been successful in tracing a "missed" case, as well as watchful for the occurrence of the disease in those who may have been in contact with the patient. The case is promptly removed to Lodge Moor, and so far there has been no difficulty in effecting this. So convinced is Dr. Littlejohn of the need for isolating the cases that he would insist on removal at any cost. Provision has been made at Lodge Moor for isolating members of infected families, or others known to have been exposed to infection and in selecting those who shall be thus "quarantined" for 15 days the Medical Officer uses his own discretion. He is influenced in this regard by the poverty of the household, the condition and accommodation of the house, the time during which the case has been at home before removal, and the degree of intimacy between the patient and the friends. It will be seen from the tables in the Appendix (IV. and VII.), that there were 58 persons so removed, the youngest being newly born, the oldest aged 100 years, a man who was unvaccinated, and in whom primary vaccination was attempted but failed. Only two of the quarantined developed small pox, one being a girl 12 years old who had been re-vaccinated in 1887, the other an unvaccinated boy, 8 years old, who was vaccinated on being admitted to quarantine. The annexed summary gives particulars of the cases of persons quarantined (Table V.).

TABLE V.

Persons sent to Quarantine.

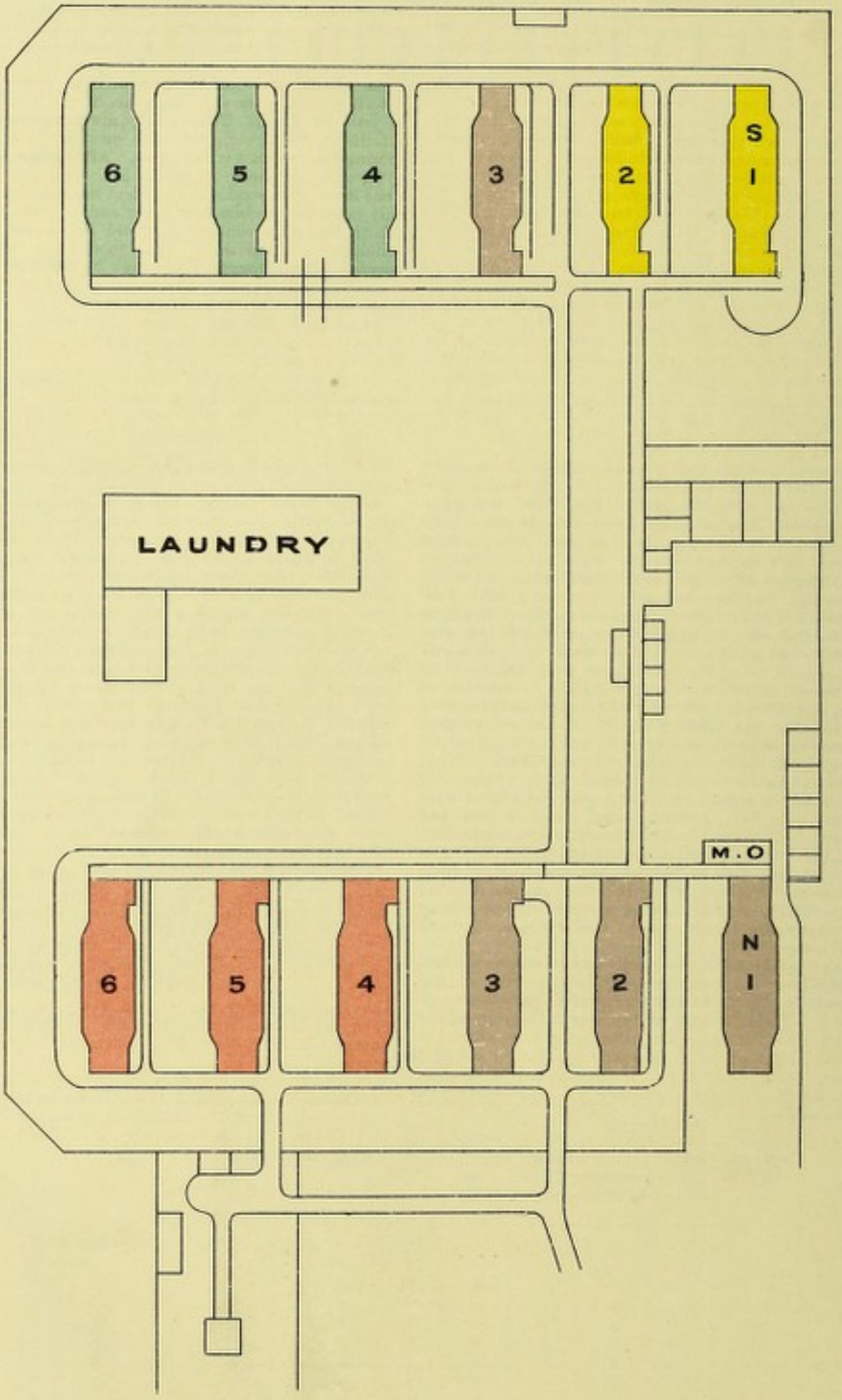
Age.	Males.	Females.	Vaccinated.	Alleged Vaccination (no marks).	Unvaccinated.	Re-vaccinated.			Developed Small-pox.
						Previous Years.	After Reception.		
							S.	U.	
Under 1 year	1	—	—	—	1	—	—	—	—
1-5 years	3	2	5	—	—	—		—	—
5-10 „	8	6	10	1	3	—	*2	1	1
10-15 „	2	9	11	—	—	2	7	—	1
15-20 „	1	3	4	—	—	2	1	2	—
20-30 „	3	2	4	—	1	2	†3	1	—
30-40 „	3	3	3	—	3	1	†2	1	—
40-50 „	2	4	2	*1	—	1	—	3	—
50-60 „	1	1	1	1	—	—	—	—	—
60-70 „	1	—	—	1	—	—	—	—	—
70-	1	—	—	—	1	—	—	1	—
80-	1	—	—	—	1	—	—	—	—
100-	1	—	—	—	1	—	†1	—	—
Total	28	30	40	7	11	7	16	9	2

* These had small-pox in 1887. † One case a primary vaccination. S = Successful. U = Unsuccessful.



LODGE MOOR HOSPITAL.

BLOCK PLAN.



To illustrate allocation of the Wards at Lodge Moor Hospital, during Small Pox Outbreak.-1892-3.

Small Pox. — *Administration.*
Scarlet Fever. — *Quarantine.*

To face p. 171.

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It will be seen that 25 were re-vaccinated, 16 successfully (including three primary vaccinations). Of the failures three had been re-vaccinated in 1887, one in 1881, whilst two re-vaccinated in 1887 and 1881 respectively again "took" well.

When the inmates of affected houses were not removed to quarantine, the houses were visited daily for a period of 16 days by an inspector. Sometimes permission was granted to those engaged in work to follow their avocation, especially if they had been re-vaccinated. In this the Medical Officer exercised his discretion, according to the nature of the individual's employment. Thus he would permit an iron-worker to continue his duties, but not one engaged in a mill or crowded room.

The houses are thoroughly disinfected and cleansed, and all bedding and other articles are removed to the disinfecting station in Plum Lane. Two men are employed there—one to remove articles, the other to look after the Washington Lyons disinfector. The clothing of patients is disinfected at Lodge Moor in a Washington Lyons steam disinfector.

The steps taken when a case arises in a common lodging house—and there have been several such—are somewhat different. The patient being removed, all the bedding in the room he occupied is disinfected by steam, the room itself and the kitchen ordered to be lime-washed and thoroughly cleansed, whilst the inspector makes daily or bi-daily visits to ascertain whether any more of the inmates are ailing. No attempt is made to detain the lodgers in their quarters, as it is felt that it could not succeed, and might even defeat its purpose by encouraging the men to conceal information as to the places where they are engaged at work. So far all the infected lodging houses have been large ones, with 50 to 60 inmates, but if a smaller lodging house were in question it would be possible to quarantine the inmates and compensate them for loss of wages.

As already stated, the hospital at Lodge Moor has been utilised for the reception of cases of scarlet fever from the Winter Street Hospital during the years 1889 to 1893, the present time. When in March 1892 the first case of small-pox arose, there were only two wards thus occupied, namely Nos. 4 and 5 on the S. side, since those on the N. side, Nos. 4, 5, 6, were under repair, and Nos. 1, 2, 3, were being used as heretofore for administration. Until the N. wards were set free the fever cases were transferred to wards 2 and 3 on the S. side, and a barricade erected between wards 4 and 5, so as to devote wards 5 and 6 to small-pox. At the same time all the children in the hospital who were over 10 years of age were re-vaccinated, and those who had not previously been vaccinated were vaccinated. The whole staff were also re-vaccinated, including those nurses who had been re-vaccinated in 1887–88.

Meanwhile the wards on the N. side were being rapidly prepared, and within a week all the scarlet fever cases were transferred to the wards 4, 5, 6, on the N. side.

With the increase in the number of small-pox patients another ward was set apart for their reception, and the barricade in the S. corridor removed to between wards 2 and 3. The allocation of the wards from that time has remained the same, since the cases of small-pox in hospital never exceeded the accommodation afforded by three wards, each of which contains ten beds. The accompanying diagram (Plate XXVII.) shows this allocation:—

South Side.

1, 2.—Small-pox quarantine.
3.—For small-pox nurses.
4, 5, 6.—Cases of small-pox.

North Side.

1, 2, 3.—Administration.
4, 5, 6.—Scarlet fever.

The nurses and wardmaids employed in the small-pox wards, varying in number from three to eight, according to the number of patients are thus kept apart from the rest of the staff. They generally serve for a month in these wards, and during their term of duty here are not allowed to enter any other part of the hospital, nor to visit Sheffield. The open position of the hospital permits of their taking exercise on the moor without coming into contact with others. Altogether 24 different people have been employed in the small-pox block since it was re-opened. The resident medical officer is the only person who visits both departments of the hospital, taking every precaution to avoid the conveyance of contagion in his clothing. The food, coals, and other necessaries are brought to the door of the small-pox department and deposited there, being then taken in by the nurses.

As to the "Isolation" (quarantine) wards, so far one has sufficed, since there have never been more than ten inmates at a time.

At the time of my visit there were 13 cases of small-pox in the wards, all doing well, and 12 of these came from Sheffield. The other was from one of the neighbouring districts, which being unprovided with hospital accommodation, have been allowed to send their cases to Lodge Moor on payment to the Sheffield Corporation of 2*l.* 10*s.* weekly per case.

When a small-pox patient is discharged he takes a bath, puts on clean clothing, but as there is no egress (except by the window) from the end of the ward where the bath-room is situated, he must perforce pass through the ward before he can leave the building.

Steps taken by sanitary authorities.

Finally, as to the steps taken to ensure early notification of cases of small-pox, I may state that at the end of July last, the Medical Officer of Health issued a circular letter to medical practitioners, calling attention to the risks entailed by the non-recognition of mild cases of the disease, and inviting communications in any cases of doubt (Appendix VII.).

In January of the present year notices of facilities for free vaccination and re-vaccination were issued (Appendix VII.).

Conclusions.

1. The sanitary organisation of Sheffield is well planned, but the department might reasonably be provided with additional inspectors in view of the large area under the control of the department.

2. The measures taken by the medical officer of health and his inspectors to deal with the outbreak of small-pox are energetic and thorough. It is noteworthy that the medical officer has visited every case which has been notified to him, and to his personal efforts and energy the limitation of the outbreak may largely be ascribed.

3. The situation of Lodge Moor hospital is excellent for the thorough isolation of small-pox patients.

I desire to thank Dr. Littlejohn, as well as Drs. Gould and Caley, for their courtesy and lucid assistance during this inquiry.

S. C.

London, March 1, 1893.

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APPENDIX I.

(*From Dr. Littlejohn's Annual Report on the Health of the County Borough of Sheffield for the Year* 1891.)

TABLE I.—Showing the Population of each of the Nine Registration Sub-Districts at the Census of 1881 and 1891; also the Computed Population at the middle of 1891:—

District.	Population, 1881.	Population, 1891.	Middle of 1891.
Sheffield, West - - -	14,937	14,105	14,083
,, North - - -	38,982	37,499	37,460
,, South - - -	17,919	18,411	18,424
,, Park - - -	19,948	21,401	21,439
Brightside - - - -	56,719	67,083	67,300
Attercliffe - - - -	26,965	35,883	36,119
Nether Hallam - - -	38,967	46,328	46,525
Upper Hallam - - -	2,513	2,709	2,714
Ecclesall - - - -	67,538	80,824	81,180
	284,508	324,243	325,304

TABLE II.—Showing the Area in Acres, and Number of Persons per Acre in each of the Nine Registration Sub-Districts:—

District	Area in Acres.	Population 1891.	Persons per Acre.
Sheffield, West - - -	198	14,083	71·1
,, North - - -	160	37,460	234·1
,, South - - -	253	18,424	72·8
,, Park - - -	2,417	21,439	8·8
Brightside - - - -	2,821	67,300	23·8
Attercliffe - - - -	1,297	36,119	27·8
Nether Hallam - - -	1,548	46,525	30·2
Upper Hallam - - -	6,314	2,714	0·4
Ecclesall - - - -	4,633	81,180	17·5
	19,651	325,304	16·5

APPENDIX II.

Copy of Form used for the Registration of Cases of Infectious Diseases, and filled up by the Inspector.

Epidemic Disease.

District of _____

Date of Visit, _____

Disease, _____

Reported by _____

Name _____

Residence, _____

Age, _____ *School,* _____

Occupation, _____ *Date of Rash,* _____

Date of probable exposure to infection, _____

Date of first feeling ill, _____

Probable source of infection, _____

Milk supply _____

Number of Apartments, _____

Number of Inmates, _____ *Adults,* _____ *Children,* _____

Number of Lodgers, _____

Trade of Parent, _____

Books from Library, _____

Privy accommodation and state _____

Water supply, _____ *Ventilation* _____

Disposal of Patient, _____

Requirements of Dwelling, _____

History of Case and Remarks, _____

Result and date thereof, _____

_____ *Inspector.*

APPENDIX III.

Vaccination Returns. Ecclesall Bierlow Union.

RETURN FOR 1891.

Return of the Vaccination Officers of the Ecclesall Bierlow Union, respecting the Vaccination of Children whose Births were registered in their Districts from 1st January to 31st December, 1891, inclusive.

Registration Sub-Districts comprised in the Vaccination Officer's District.	Number of Births returned in the "Birth List Sheets" as registered from 1st January to 31st December 1891.	Number of these Births duly entered by 31st January 1893, in Columns 10, 11, and 13 of the "Vaccination Register" (Birth List Sheets), viz.:—					Number of these Births which on 31st January, 1893, remained unentered in the "Vaccination Register" on account (as shown by Report Book) of			Number of these Births remaining on 31st January, 1893, neither duly entered in the "Vaccination Register" (Columns 3, 4, 5, and 6 of this Return) nor temporarily accounted for in the "Report Book" (Columns 8, 9, and 10 of this Return).
		Column 10. "Successfully Vaccinated."	Column 11. "Insusceptible of Vaccination."	Column 11. "Had Small-pox."	Column 13. "Dead, unvaccinated."	[*This Column to be left blank.*]	Postponement by Medical Certificate.	Removal to Districts the Vaccination Officer of which has been duly apprized.	Removal to Places unknown, or which cannot be reached; and Cases not having been found.	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Ecclesall Bierlow -	2,747	2,392	28	—	283		21	50	50	7
2. Nether Hallam -	1,728	1,429	7	—	191		5	15	78	8
3. Upper Hallam - -	163	119	1	—	18		3	2	16	4
4. Norton - - -	1,967	151	—	—	26		3	5	11	—
Total - -	4,834	4,607	36	—	518		32	72	155	14

RETURN FOR THE PERIOD JANUARY—JUNE, 1892.

Return of the Vaccination Officers of the Ecclesall Bierlow Union, respecting the Vaccination of Children whose Births were registered in their Districts from 1st January to 30th June, 1892, inclusive.

Registration Sub-Districts comprised in the Vaccination Officer's District.	Number of Births returned in the "Birth List Sheets" as registered from 1st January to 30th June 1892.	Number of these Births duly entered by 31st January, 1893, in Columns 10, 11, and 13, of the "Vaccination Register" (Birth List Sheets), viz.:—					Number of these Births which on 31st January, 1893, remained unentered in the "Vaccination Register" on account (as shown by Report Book) of			Number of these Births remaining on 31st January, 1893, neither duly entered in the "Vaccination Register" (Columns 3, 4, 5, and 6 of this Return) nor temporarily accounted for in the "Report Book" (Columns 8, 9, and 10 of this Return).
		Column 10. "Successfully Vaccinated."	Column 11. "Insusceptible of Vaccination."	Column 11. "Had Small-pox."	Column 13. "Dead, unvaccinated."	[*This Column to be left blank.*]	Postponement by Medical Certificate.	Removal to Districts the Vaccination Officer of which has been duly apprized.	Removal to Places unknown, or which cannot be reached; and Cases not having been found.	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Ecclesall Bierlow -	1,269	1,031	13	—	128		24	21	24	8
2. Nether Hallam -	825	650	1	—	90		8	12	60	4
3. Upper Hallam -	67	44	1	—	8		1	1	9	3
4. Norton - - -	87	68	—	—	10		1	2	4	2
Total - -	2,248	1,813	15	—	236		34	36	97	

APPENDIX IV.—Table of Cases of Small-pox. 1892-93.

No.	Name.	Sex.	Age.	Notification.	Onset.	Rash.	Removal to Hospital.	Type.	Result.	Vaccination.	Probable Source of Infection.	Persons quarantined at Lodge Moor in connexion with Case.				
												Males.	Females.	Vaccinated.	Re-vaccinated.	
															Before.	After.
1	J. B.	M.	35	March 31	March 25	March 27	March	Varioloid	Recovered.	In infancy. 3 poor marks. Re-vaccinated in 1887	At Stocksbridge, where often engaged		4	4		1
2	E. L.	F.	21	April 30	April 26	April 28	April 30	„	„	„ 3 faint „	Father and brother had work at Stocksbridge	1	1	1 and 1 alleged; no marks.		
3	J. S.	M.	23	May 2	„ 25	„ 26	May 2	„	„	„ 3 good „	May have contracted it at Stocksbridge	1	7	8	4 in 1887.	3 (failed)
4	A. S.	F.	12	——	May 3	May 8	„		„	„ 4 good „ Re-vaccinated in 1887	Developed in hospital, where quarantined on May 2. Probably infected by brother, No. 3.					
5	J. B.	M.	20	May 8	„ 3	„ 6	„ 8		„	„ 3 good „	Arrived in Liverpool from Brazil 12 days before		1	1	1 in 1887.	
6	L. B.	F.	16	„ 12	„ 7	„ 10	„ 12	Semi-confluent.	„	At 4 years. 3 faint „	At same factory as No. 4	3	3	6		3 (1 failed).
7	A. K.	F.	23	„ 15	„ 11	„ 14	„ 15	Coherent	„	In infancy. 3 good „	„ „	2		1		
8	B. B.	F.	17	„ 16	„ 10	„ 16	„ 16	Discrete	„	„ 4 good „	„ „					
9	F. W.	F.	15	„ 30	„ 29	„ 30	„ 30	Varioloid	„	„ 4 good „	„ „					
10	G. B.	F.	16	June 2	„ 31	June 2	June 2	„	„	„ 2 good „	„ „					
11	G. R.	M.	32	„ 27	June 25	„ 26	„ 27	Confluent	„	„ 2 good „	Source of infection doubtful.					
12	W. F.	M.	55	„ 29	?	„ 29	„ 29	Discrete	„	„ 2 faint	„ „					
13	M. R.	F.	30	July 12	July 10	July 12	July 12	„	„	„ 2 faint „	Infected by G. R., No. 11.					
14	T. C.	M.	30	„ 15	„ 14	„ 15	„ 15	Confluent	Died	Alleged; but no marks visible	At Chesterfield.					
15	M. N.	M.	30	„ 25	„ 23	„ 25	„ 25	„	Recovered.	„ „ „	Source of infection doubtful.					
16	F. V.	M.	60	„ 25	„ 16	„ 19	„ 25	Varioloid	„	In infancy. 2 faint marks	„ „					
17	W. H. V.	M.	18	„ 25	„ 15	„ 17	„ 25	„	„	„ 6 good „	Nos. 16, 17, 18, occupied a house back-to-back with that of No. 20, and adjacent to that of No. 19. Cases 17 and 18 were unrecognised until Nos. 16 and 19 were found to be ill. At same time medical officer of health found No. 20 with a suspicious eruption.	3	2	3		Primary ?
18	C. V.	F.	11	„ 25	„ 22	„ 24	„ 25	„	„	„ 2 good „						
19	F. M.	M.	32	„ 25	„ 22	„ 24	„ 25	Discrete	„	„ 1 good mark						
20	W. M.	M.	46	„ 25	?	„ 22	„ 25		„	Alleged; but no marks visible						
21	L. E.	F.	21	„ 29	„ 26	„ 29	„ 29	Discrete	„	In infancy. 3 faint marks						
22	M. H.	F.	13	„ 29	„ 27	„ 28	„ 29	„	„	Unvaccinated	At common lodging house, where No. 14 lived.					
23	J. T.	M.	28	„ 29	„ 28	„ 29	„ 29	Confluent	Died	In infancy. 4 good marks. Re-vaccinated (?) in army	„ „ (probably).					
24	A. S.	F.	15	„ 30	„ 28	„ 29	„ 30	Coherent	Recovered.	„ 2 faint „	Probably through No. 25, in same house.					
25	R. B.	M.	29	„ 30	„ 26	„ 29	„ 30	Varioloid	„	„ 1 good „	A navvy, working with others from infected districts.					
26	W. B.	M.	29	August 3	„ 29	„ 31	August 3	„	„	„ 4 faint „	At same lodging house as Nos. 14 and 23; or at Chesterfield, where working.	1		1		1
27	A. H.	F.	33	„ 8	August 3	August 5	„ 8	Discrete	„	„ 2 faint „	Unknown					
28	S. B.	F.	7	„ 10	„ 10	—	„ 10	Varioloid	„	„ 4 good „	Daughter of No. 25.					
29	A. H.	F.	20	„ 12	„ 7	August 9	„ 12	„	„	„ 4 good „	Through her brother, No. 30.					
30	E. H.	M.	18	„ 12	„ 8	„ 9	„ 12	„	„	„ 4 good „	Probably at Brigg	2	3	4		2

APPENDIX IV.—*continued.*

No.	Name.	Sex.	Age.	Notification.	Onset.	Rash.	Removal to Hospital.	Type.	Result.	Vaccination.	Probable Source of Infection.	Persons quarantined at Lodge Moor in connexion with Case.			
												Males.	Females.	Vaccinated.	Re-vaccinated.
31	J. B.	F.	48	August 12	August 9	August 12	August 12	Variolоid.	Recovered.	In infancy. 2 faint marks	From No. 21, whom she visited when ill	2		1 alleged, uncertain	After. 1 failed.
32	M. W.	F.	9	„ 22	„ 21	—	„ 22	Coherent.	„	Unvaccinated	Stepsister to No. 33	2	2	2	1 1 failed.
33	J. G.	M.	18	„ 22	„ 20	August 21	„ 22	Discrete.	„	In infancy. 3 good marks	Probably at Penistone, where slept with a man suffering from a rash.			2 alleged.	
34	J. F.	M.	21	Sept. 27	Sept. 24	Sept. 27	Sept. 27	Confluent.	„	„ 6 faint „	Working on Ship Canal at Runcorn	1		—	1
35	W. W.	M.	14	Oct. 9	Oct. 8	Oct. 9	Oct. 9	„	„	Unvaccinated	Small-pox in family of a mate at colliery.				
36	E. R.	M.	17	Nov. 1	„ 26	„ 27	Nov. 1	Variolоid.	„	In infancy. 1 good mark	Son of L. H., keeper, where 37 and 38 lived.				
37	R. McD.	F.	6	„ 1	„ 27	„ 31	„ 1	Confluent.	„	Unvaccinated	Probably at Barnsley, 14 days before		2	1 2 alleged.	1 2 failed.
38	M. W.	F.	24	„ 1	„ 28	„ 31	„ 1	„	Died.	In infancy. 3 faint marks	Either from No. 37 or at Chapel-le-Firth.				
39	A. E.	M.	28	„ 3	—	Nov. 2	„ 3	Discrete.	Recovered.	„ 2 faint „	By customers from Handsworth.				
40	J. D.	M.	22	„ 7	Nov. 6	„ 6	„ 7	Variolоid.	„	„ 3 faint „	At Chesterfield.				
41	F. E.	F.	23	„ 22	„ 21	„ 22	„ 22	Discrete.	„	„ 3 good „	Unknown.				
42	J. U.	M.	27	„ 24	„ 22	„ 23	„ 24	Variolоid.	„	„ 3 good „	? at Lodge Moor, where working.				
43	A. W.	M.	26	Dec. 12	Dec. 7	Dec. 10	Dec. 12	Coherent.	„	„ 3 faint „	At Leeds.				
44	E. S.	F.	17	„ 12	—	„ 11	„ 12	Discrete.	„	„ 3 good „	By No. 42.				
45	E. L.	F.	11	„ 25	Dec. 22	„ 23	„ 26	Coherent.	„	Unvaccinated	Unknown	3	4	6	3
46	S. D.	M.	52	„ 25	„ 25	„ 26	„ 26	Confluent.	„	Alleged; no marks visible	At Totley.				
47	J. S.	M.	34	„ 27	„ 26	„ 27	„ 27	Variolоid.	„	„ „	„				
48	A. L.	M.	8	Jan. 4	Jan. 3	Jan. 4	Jan. 4	Coherent.	Still in Hosp.	"Under" vaccinated. Dec. 27	Quarantined when No. 45 removed Dec. 26.				
49	J. G.	M.	34	„ 12	„ 11	„ 11	„ 12	Discrete.	„	In infancy. 3 fair marks	At same L.H. as Nos. 46 and 47.				
50	T. E.	M.	25	„ 12	„ 10	„ 11	„ 12	„	Recovered.	„ 3 good „	„ „ „				
51	P. R.	M.	27	„ 18	„ 10	„ 12	„ 18	Variolоid.	„	„ 5 good „	At Hathersage.				
52	A. H.	F.	25	„ 20	—	„ 16	„ 20	„	„	„ 3 fair „	At Whittington Moor.				
53	J. F.	M.	29	„ 22	Jan. 16	„ 20	„ 22	Coherent.	Still in Hosp.	„ 4 good „	Unknown.				
54	H. W.	M.	30	„ 23	„ 23	„ 23	„ 24	Discrete.	„	„ 2 good „	At Halifax or Bradford.				
55	M. J.	F.	21	„ 29	„ 24	„ 28	„ 29	Confluent.	„	Unvaccinated	Unknown	3	1	1	
56	L. B.	F.	22	„ 31	„ 22	„ 30	„ 31	Discrete.	„	In infancy. 3 good marks	„				
57	W. S.	M.	32	Feb. 3	?	?	Feb. 9 (from work.)	„	„	„ 4 faint „	At Leeds. Admitted workhouse Jan. 30.				
58	J. R.	M.	35	„ 4	Feb. 4	Feb. 4	Feb. 4	„	„	„ 2 good „	Possibly by No. 54.				
59	J. W.	M.	63	„ 7	—	—	„ 7	„	„	„ 1 faint mark	At Totley.				
60	G. B.	M.	27	„ 7	—	—	„ 7	Confluent.	„	„ 1 faint „	In workhouse (?) where arrived Jan. 26.				

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APPENDIX V.

ANALYTICAL SUMMARY of CASES of SMALL-POX admitted into Lodge Moor Hospital.

(Prepared by Dr. Caley, Resident Medical Officer.)

FORTY-SEVEN CASES of SMALL-POX admitted from the Borough of Sheffield. 1892.

ANALYSIS showing Type and Mortality in relation to Vaccination.

Degree of Vaccination.	Under 15 years of age.								Over 15 years of age.							
	Varioloid.		Discrete.		Coherent.		Confluent.		Varioloid.		Discrete.		Coherent.		Confluent.	
	Total.	Deaths.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.
Unvaccinated	—	—	1	—	2	—	2	—	—	—	—	—	—	—	—	—
Alleged vaccination, no marks	—	—	—	—	—	—	—	—	3	—	—	—	—	—	2	
1 bad mark	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—
2 „ marks	—	—	—	—	1	—	—	—	2	—	1	—	—	—	—	—
3 „ „	—	—	—	—	—	—	—	—	3	—	1	—	2	—	1	1
4 „ „	—	—	—	—	—	—	—	—	1	—	—	—	—	—	1	—
1 good mark	—	—	—	—	—	—	—	—	2	—	2	—	—	—	—	—
2 „ marks	1	—	—	—	—	—	—	—	1	—	—	—	—	—	1	—
3 „ „	—	—	—	—	—	—	—	—	3	—	2	—	1	—	—	—
4 „ „	3	—	—	—	—	—	—	—	3	—	1	—	—	—	1	1

Cases admitted from Sheffield and other Districts. 1892.

ANALYSIS of 83 CASES of SMALL-POX, showing Vaccination, &c.

Degree of Vaccination.	Under 15 years of age.								Over 15 years of age.							
	Varioloid.		Discrete.		Coherent.		Confluent.		Varioloid.		Discrete.		Coherent.		Confluent.	
	Total.	Deaths.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.	T.	D.
Unvaccinated	—	—	1	—	2	—	5	2	—	—	3	—	2	—	2	1
Alleged vaccination, no marks	—	—	—	—	—	—	—	—	2	—	1	—	—	—	3	2
1 bad mark	—	—	—	—	—	—	—	—	1	—	2	—	1	—	2	—
2 „ marks	—	—	—	—	1	—	—	—	3	—	5	—	—	—	1	1
3 „ „	—	—	—	—	—	—	—	—	6	—	2	—	2	—	1	1
4 „ „	—	—	—	—	—	—	—	—	2	—	—	—	—	—	1	—
1 good mark	—	—	—	—	—	—	—	—	3	—	2	—	—	—	—	—
2 „ marks	1	—	—	—	—	—	—	—	1	—	—	—	—	—	1	—
3 „ „	1	—	—	—	—	—	—	—	3	—	3	—	1	—	—	—
4 „ „	3	—	—	—	—	—	—	—	8	—	1	—	—	—	1	1

APPENDIX VI.

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List of Persons from Infected Houses sent to Isolation Wards at Lodge Moor, with Particulars as to their Vaccination, &c.

Ref. No.	Date.	Initials.	Sex.	Age.	Primary Vaccination.	Re-vaccination.		Other cases.
						Before.	After.	
	1892.							
1	March 31 - -	C. B.	F.	39	3 faint marks.	—	—	
		E. B.	F.	11	4 good marks -	—	4 good marks.	
		L. B.	F.	10	3 „ „ -	—	—	
		A. B.	F.	8	4 „ „ -	—	—	
2	April 30 - -	E. L.	F.	53	Alleged; no marks visible.	—	Declined.	
3	May 3 - - -	F. S.	F.	14	6 good marks -	1887	—	
		L. S.	F.	8	4 „ „ -	—	—	
		A. S.	M.	4	4 „ „ -	—	—	A. S. was also sent in for isolation, and developed small-pox on May 8. (She had been re-vaccinated in 1887.
		M. A. S.	F.	22	4 „ „ -	1887	Failed.	
		E. S.	F.	17	4 „ „ -	1887	Failed.	
		A. S.	F.	18	4 „ „ -	1887	Failed.	
		A. S.	F.	41	1 good mark -	—	—	
2	May 3 - - -	D. L.	M.	52	1 „ „ -	—	Declined.	
5	May 8 - - -	E. B.	F.	22	1 faint „ -	1887	4 good marks.	
6	May 12 - - -	J. J.	F.	38	2 faint marks -	—	Failed.	
		A. J.	M.	6	4 good „ -	—	—	
		B. J.	M.	5	4 „ „ -	—	—	
		E. J.	F.	1	4 „ „ -	—	—	
		W. B.	M.	14	2 faint „ -	—	2 good marks.	
		A. B.	F.	11	3 good „ -	—	4 good marks.	
7	May 15 - - -	J. H. K.	M.	22	1 good mark -	—	4 good marks.	
		J. H. K.	M.	Born	Died after seven days; immaturity.	—	—	
19	July 25 - -	A. M.	F.	30	Unvaccinated -	—	4 good marks.	
		E. M.	F.	9	2 good marks -	—	—	
		S. M.	M.	7	2 „ „ -	—	—	
		G. M.	M.	5	Unvaccinated -	—	4 good marks.	
		A. M.	M.	3	4 good marks -	—	—	
27	August 8 - -	C. H.	M.	31	1 good mark -	—	1 good mark.	
31	August 12 - -	W. B.	M.	61	Alleged; no marks visible.	—	3 good marks.	
		J. B.	M.	160	Unvaccinated -	—	Failed.	
30	August 12 - -	J. H.	F.	42	Had small-pox in 1887.	—	—	
30	August 12 - -	P. H.	F.	12	4 good marks -	—	4 good marks.	
		G. H.	M.	7	4 „ „ -	—	4 good marks.	
		S. H.	F.	5	4 „ „ -	—	—	
		H. H.	M.	3	4 „ „ -	—	—	
32	August 22 - -	M. H.	F.	45	Alleged; no marks visible.	—	Failed.	
		J. W.	M.	46	3 faint marks -	—	—	
		S. W.	F.	11	4 good „ -	—	—	
		T. W.	M.	7	Alleged; no marks visible.	—	Failed.	
34	September 27 -	G. M.	M.	23	Unvaccinated -	—	4 good marks.	
37	November 1 - -	J. McD.	M.	47	Alleged no marks visible.	1885	Failed.	
		L. McD.	F.	10	3 fair marks -	—	4 good marks.	
		M. McD.	F.	47	No marks - -	—	Failed.	
		C. W. P.	M.	20	4 good marks -	—	—	
45	December 25 -	C. L.	F.	1	2 „ „ -	—	—	Albert Lingard was also sent in for isolation and developed small-pox on January 3.
		W. L.	F.	5	2 „ „ -	—	—	
		E. L.	M.	6	1 faint mark -	—	—	
		G. L.	F.	12	2 faint marks -	—	4 good marks.	
		W. L.	M.	14	2 good „ -	—	4 good marks.	
		F. L.	F.	16	3 „ „ -	—	4 good marks.	
	1893.							
55	January 29 - -	J. L.	M.	17	2 fair marks -	—	—	
		J. P.	M.	80	Unvaccinated -	—	—	
		A. P.	M.	70	„ -	—	—	
		A. P.	M.	33	„ -	—	—	
		A. P.	M.	36	„ -	—	—	
		M. P.	F.	7	„ -	—	—	

SHEFFIELD.

APPENDIX VII.

COPY of CIRCULAR LETTER addressed to Medical Practitioner.

SHEFFIELD SANITARY AUTHORITY.

Health Office, North Church St.
Sheffield, July 30th, 1892.

DEAR SIR,

OWING to the prevalence of Small-pox in the surrounding districts, and the probability of the infection being introduced into the Borough, I am directed by the Health Committee to call your attention to the danger of mild cases being unrecognised or mistaken for other diseases, and allowed to remain without proper isolation.

The Health Committee would be pleased if you will be good enough to exercise special precautions in regard to such patients, and communicate with me in any doubtful case.

Yours faithfully,
HARVEY LITTLEJOHN.

Health Office open	-	-	9 to 6.
Saturday	-	-	9 to 2.
Sunday	-	-	11 to 12.

APPENDIX VIII.

COPY of NOTICES as to GRATUITOUS VACCINATION.

BOROUGH OF SHEFFIELD.

VACCINATION AND RE-VACCINATION FREE.

The Health Committee earnestly request the Public to avail themselves of this great and simple SAFEGUARD AGAINST SMALL-POX.

Small-pox is the most infectious of all diseases, and Vaccination and Re-Vaccination is the only certain protection from it.

Vaccination of Infants and also Re-Vaccination will be performed FREE of CHARGE.

Every MONDAY, at 2 o'clock, in the Vestry Hall, Cemetery Road.

Every MONDAY at 3 o'clock, at the Vestry Hall, Crookesmoor.

HARVEY LITTLEJOHN,
January, 1893. Medical Officer of Health.

BOROUGH OF SHEFFIELD.

VACCINATION AND RE-VACCINATION FREE.

The Health Committee earnestly request the Public to avail themselves of this great and simple safeguard against Small-pox.

Small-pox is the most infectious of all diseases, and Vaccination and Re-Vaccination is the only certain protection from it.

Vaccination of Infants and also Re-Vaccination will be performed FREE of CHARGE.

Every TUESDAY, at 3 o'clock, in the Temperance Hall, Townhead Street.

Every WEDNESDAY, at 3 o'clock, in the Park Chapel Vestry, South-Street, Park.

BRIGHTSIDE WEST.

Every WEDNESDAY, from 3 to 4 o'clock, in the Andover-Street Chapel.

BRIGHTSIDE EAST.

Every TUESDAY, at 2 o'clock, in the School, School Lane, Wicker.

Every WEDNESDAY, at 11 o'clock, in the Vestry of the Wesleyan Reform Chapel, Grimesthorpe.

ATTERCLIFFE.

Every MONDAY, from 2 to 4 o'clock, in the Reform Chapel and Sunday Schoolroom, Attercliffe.

HARVEY LITTLEJOHN,
January, 1893. Medical Officer of Health.

APPENDIX IX.

SHEFFIELD UNION.

Year.	Births registered during Year.	Of the Children whose Births were registered during the Year given in the First Column, by the 31st January in the Year next but one following that Year there were :— Successfully Vaccinated.	Certified as Insusceptible of Vaccination.	Had Small-pox.	Died Unvaccinated.	Vaccination postponed by Medical Certificate.	Remaining.	The Children not finally accounted for (including Cases postponed) being per cent. of Births.
1872	7,032	5,415	23	21	891	682		9·7
1873	7,431	5,876	6	1	923	32	593	8·4
1874	7,579	6,019	7	0	1,047	41	465	6·7
1875	7,732	6,192	6	1	971	21	541	7·3
1876	7,719	6,176	4	0	912	32	595	8·1
1877	7,488	6,221	4	0	732	38	493	7·1
1878	7,319	5,976	4	0	916	25	398	5·8
1879	7,029	5,910	3	0	736	46	334	5·4
1880	7,225	5,970	5	0	871	20	359	5·2
1881	7,229	6,074	8	0	788	18	341	5·0
1882	7,195	5,998	4	0	826	38	329	5·1
1883	7,154	5,987	13	2	776	39	337	5·3
1884	7,460	6,250	10	1	854	30	315	4·6
1885	7,257	6,149	14	0	786	13	295	4·3
1886	7,212	6,178	11	2	779	18	224	3·4
1887	7,128	6,122	14	12	781	14	185	2·8
1888	6,912	5,689	39	5	814	13	352	5·3
1889	7,473	6,203	20	0	866	22	362	5·1
1890	7,265	5,914	16	0	917	23	395	5·8
1891	7,818	6,325	26	0	926	26	515	6·9
1892	—	—	—	—	—	—	—	—

VIII.—Report on the Prevalence of Small-pox at Halifax, 1892-93.

CONTENTS.

§ 1.—*Halifax: Sanitary Administration.*
Area and Population.
Sanitary Organisation.
Compulsory Notification.
Measures taken in Small-pox Outbreaks.
Borough Fever and Small-pox Hospital.

§ 2.—*Vaccination at Halifax.*
Statistics, 1873 to 1892.

§ 3.—*Previous Small-pox at Halifax.*
Cases treated at the Borough Hospital, 1872-1893.

§ 4.—*Small-pox at Halifax, 1892-1893.*
Return of Cases up to April 15, 1893.
Weekly and Monthly Incidence and Mortality.
Summary of alleged Sources of Infection.
Sex and Age Incidence.
Type of the Attacks.
Vaccination—Relations and Analysis as regards Type of Small-pox.
Re-vaccination.

§ 1. *Halifax: Area, Population, Sanitary Administration.*

The county borough of Halifax has an area of 8,209 acres, and at the Census in April 1891 a population of 82,864 (estimated in December 1891 to be 83,109). For municipal purposes the borough is divided into 12 wards, but the sanitary districts are four in number.

The sanitary administration is carried on by a Sanitary Committee of the Town Council, which meets fortnightly, and of which there are the following sub-committees:—(1.) Accounts; (2.) Hospital; (3.) Goux; (4.) Scavenging; (5.) Nuisance; (6.) Artizans' Dwellings.

The Medical Officer of Health is D. Ainley, Esq., M.R.C.S., L.R.C.P., and the sanitary staff consists of—(*a*) Chief Sanitary Inspector: (*b*) Four Assistant Inspectors; (*c*) Meat Inspector; (*d*) Two Goux Inspectors; (*e*) Foreman Scavenger; (*f*) Chief Clerk; (*g*) Assistant Clerk

There is thus one assistant inspector to each sanitary district, his duties comprising house-to-house visitation, nuisance and smoke inspection, and the removal of infectious cases to hospital.

The central office, at the Town Hall, is in telegraphic communication with the Medical Officer's residence, with the hospital, and the outlying stations in the borough.

Compulsory notification of infectious diseases has been in force since 1882, through a private Act.

It may suffice to describe the procedure adopted in regard to small-pox as to a certain extent indicative of the measures taken in cases of infectious diseases in general.

On receipt of the notification at the sanitary office, the Medical Officer of Health (if absent) is telephoned for, and on his arrival he gives instructions for the removal of the case, its isolation, and for the quarantine of other inmates of the infected house. In a certain number of cases these have been removed to quarantine at the fever hospital buildings, which (at the time of my visit) had been closed against the reception of fever patients for the past six months. Or, on the other hand, the families may be "quarantined at home," that is confined to their houses and kept under observation of the inspector for a fortnight. In such cases they may be supplied with food at the expense of the authorities, and sometimes they have received the amounts they were earning. The extent of relief thus afforded depends on the condition and circumstances of the people.*

The Medical Officer since the present outbreak has ceased general practice, and has devoted all his time to the duties of his office.

On the occurrence of infectious disease in a household from which children are attending school, the school authorities are notified of the fact, and all the children of the family are kept away from school during the period of quarantine. Reciprocally, the schools report to the health officer any cases of sickness arising amongst their scholars.

The Free Library and its branches are also informed of infectious disease in households in order that any books lent to these families may be regained and destroyed.

The procedure as regards disinfection is to at once send a van to the infected house to remove clothing, bedding, &c. to the disinfector (Goddard and Massey apparatus), and after being submitted to the process the articles are conveyed back to the house in another van specially employed for this purpose. Mr. Ainley informed me that this disinfector had been acquired comparatively recently. The house or rooms are disinfected by sulphur fumigation and carbolic acid, the walls stripped and lime-washed.

It is the practice in discharging patients from the small-pox hospital to detain them for one night in quarantine, when all their clothing is disinfected, before they are discharged to their homes. Thus they do not again go near the small-pox hospital before they leave.

The Borough Fever and Small-pox Hospital at Stoney Royd is situated on rising ground to the south-east of the town, just below the cemetery, from which it is separated by a public way entered through the cemetery gates. A low wall limits the hospital ground on this side, and the small-pox buildings are only about 40 to 60 feet distant from this wall. At the present time, however, this road is

* The difficulty of carrying out "quarantine" effectively in the case of public lodging-houses has been shown in the following instances. An inmate of the New Model Lodging-house, which accommodates 150, contracted small-pox, and was going about for five days before the fact was discovered. Next night 60 of the lodgers left, and there is reason to believe that through their agency the disease was disseminated in that quarter of the borough.

HALIFAX.

kept closed, no one being admitted to it unless having business at the hospital. On the north the grounds abut on the land set apart for the purposes of the Goux (disposal of excreta) system; whilst to the west in the valley are factories and numerous houses, about 200 yards distant from the hospital buildings.

The fever block consists of a mansion purchased in 1872, and adapted to its present purposes. Originally the rooms on the ground floor were given up to fever, and those on the first floor to small-pox, but the latter plan has not been in vogue for 10 years, since the erection of the small-pox block disconnected from the main building.

These small-pox wards are more than 50 yards distant from the main building, and have a distinct administration, kitchen, &c. They consist of four wards, two on each side of a corridor, those on the left hand being on a higher level than those on the right, and they contain in all 21 beds. There is a fifth room on a floor above, on the right hand, which is used as a private ward for two beds. These form the permanent small-pox building in use at the beginning of the outbreak, but as this progressed the accommodation became inadequate, and at first tents had to be erected in the grounds. A ward to contain 18 beds was then constructed of wood, lined with plaster, at the end of the corridor, and was opened in December. At the time of my first visit the erection of another annex was rapidly proceeding, and on my second visit (in April) it was full of inmates, mostly convalescent cases. It also contains 18 beds, but is of somewhat larger area than the other annex, and is situated to the east of the other block, at a higher level and within 20 feet of the road, the wall of which has been raised five feet.

In the accompanying plan the relative area and position of these several buildings is shown, together with other stone buildings intended for nurses' accommodation, quarantine purposes, &c., the erection of which was, however, suspended in April,* owing to the decision to remove the small-pox hospital to another site.

There is no resident medical officer attached to the hospital, but the medical officer of health visits daily, and takes charge of all the small-pox patients. There is a resident matron and a staff of five nurses.

No cases of fever have been admitted to the hospital since March 1892, and the building has been used partly for quarantine, and partly for the reception of convalescent cases from the small-pox wards.

§ 2. *Vaccination at Halifax.*

I am indebted to Mr. W. Brown, Vaccination Officer, for the subjoined table of the Vaccination Statistics for the past 20 years, from which it would appear that primary infantile vaccination has in the past five years declined to a striking extent.

* The buildings have since been completed and assigned to nurses' quarters. The hospital is to be limited in future to cases of fever.

HALIFAX UNION.

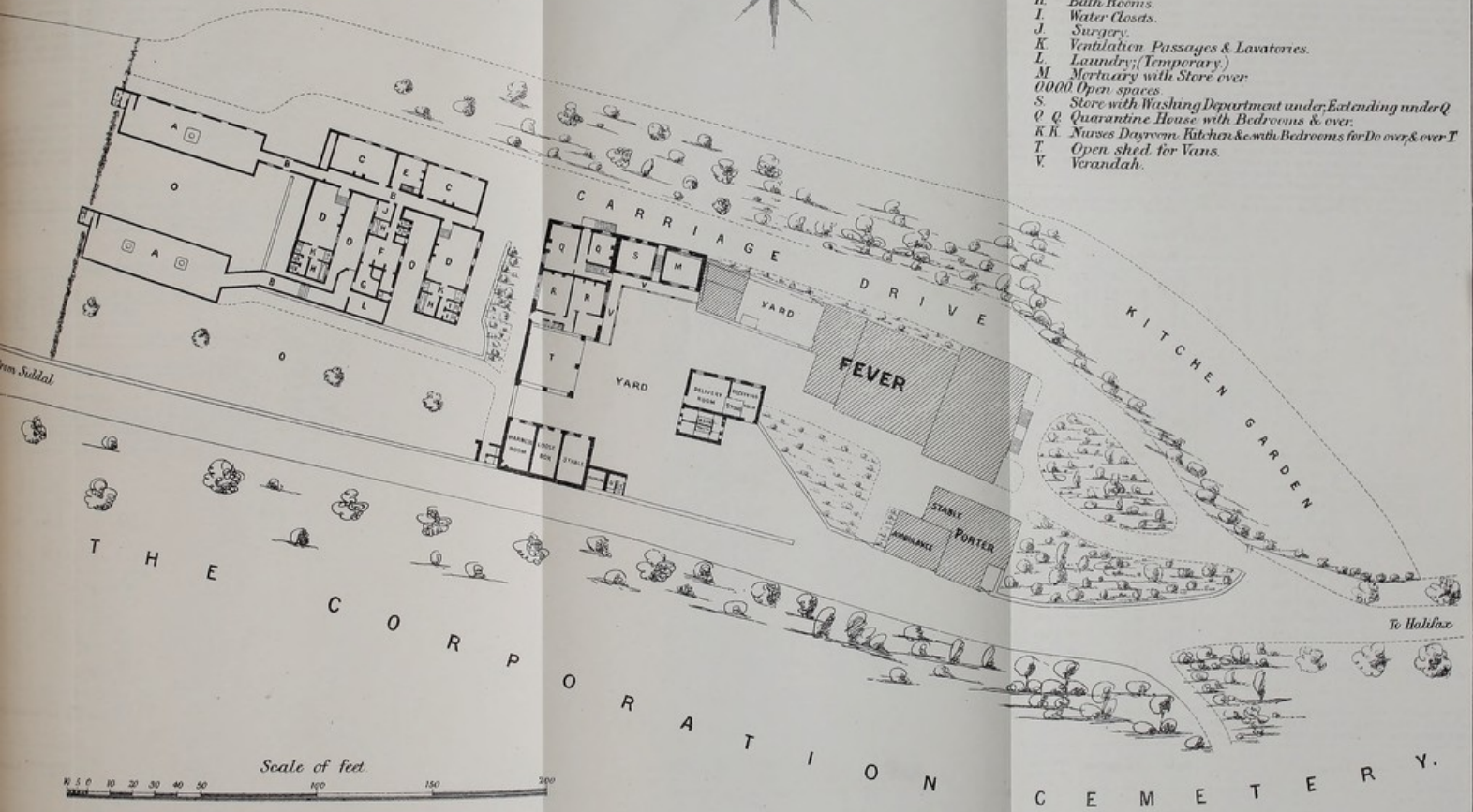
VACCINATION STATISTICS.

Year.	Number of Births.	Number vaccinated.	Insusceptible.	Had Small-pox.	Dead, unvaccinated.	Postponed.	Removals to Places known.	Removals to Places not known.	Unaccounted for.	Number of Prosecutions.	Complied after Prosecution.	Distress Warrants issued.	Distraints made.
1873	5,552	5,039	2	1	459	12	5	45	9	2	—	—	—
1874	5,777	5,141	2	—	592	9	5	24	4	2	—	—	—
1875	5,756	5,081	—	—	578	24	6	57	10	—	—	—	—
1876	5,902	5,195	2	1	554	55	6	79	10	—	—	—	—
1877	5,861	5,074	1	—	547	32	7	103	41	—	—	—	—
1878	5,824	5,027	1	1	558	66	—	111	60	—	—	—	—
1879	5,426	4,696	1	—	461	86	7	73	102	—	—	—	—
1880	5,517	4,710	5	—	584	53	13	60	92	—	—	—	—
1881	5,337	4,574	3	—	503	82	18	66	91	—	—	—	—
1882	5,200	4,396	3	—	539	70	17	66	89	29	3	—	—
1883	5,035	4,177	7	—	464	102	22	74	189	149	28	39	3
1884	3,173	3,946	6	—	629	123	12	149	317	11	1	1	—
1885	5,068	4,083	7	—	480	112	5	116	265	174	23	17	6
1886	4,973	3,797	9	—	524	112	2	110	419	16	1	—	—
1887	5,061	3,030	13	—	593	125	1	192	1,107	23	—	—	—
1888	5,040	2,167	9	—	607	82	3	143	2,029	—	—	—	—
1889	4,896	1,284	7	—	667	64	—	160	2,708	—	—	—	—
1890	4,900	737	4	—	747	42	—	209	3,161	—	—	—	—
1891	4,868	516	—	—	675	11	—	229	3,437	—	—	—	—
For the six months ended 30th June 1892.	2,298	325	2	—	290	5	—	208	1,468	—	—	—	—

These figures (which also serve to show that Halifax has had an almost steady decline in its birth-rate) may be better appreciated by estimating from them the annual average in three quinquennial and two triennial periods, thus:—

Annual Average on	Births.	Vaccinations.	Deaths unvaccinated.	Unaccounted for.	Remainder.
5 years 1873-77	5,769	5,104	546	13	106
5 „ 1878-82	5,460	4,680	533	86	161
5 „ 1883-87	5,062	3,806	536	459	261
2 „ 1888-89	4,968	1,722	637	2,369	240
2 „ 1890-91	4,884	626	711	3,299	248

THE COUNTY BOROUGH OF HALIFAX
INFECTIOUS DISEASES HOSPITAL &c.



REFERENCE.

A.A. Temporary Wards.
B.B. Corridors.
C.C Permanent Wards.
D.D. Permanent Convalescent Wards.
E. Nurse, bedroom over.
F. Kitchen.
G. Scullery.
H. Bath Rooms.
I. Water Closets.
J. Surgery.
K. Ventilation Passages & Lavatories.
L. Laundry; (Temporary.)
M. Mortuary with Store over.
0000 Open spaces.
S. Store with Washing Department under, Extending under Q
Q. Q. Quarantine House with Bedrooms & over.
K K. Nurses Dayroom Kitchen &c with Bedrooms for Do over, & over T
T. Open shed for Vans.
V. Verandah.

Scale of feet
N. S. C. 10 20 30 40 50 100 150 200

Edward R.S Escott M.Inst.C.E.
Borough Engineer March 1893.

From which it is learnt that the vaccination-rate, calculated on those known to be living at end of year, has fallen from 97·7 per cent. in the first period, 94·9 per cent. in the second, 84 per cent. in the third, 39·7 per cent. in the fourth, to only 15 per cent. in the fifth.

Mr. Brown's table also gives information of the number of prosecutions under the Vaccination Acts with their results, and it will be observed that these prosecutions commence in 1882 and cease in 1887. This is explained by the changed attitude of the Board of Guardians towards the enforcement of the law—the Board on September 7th, 1887, rescinding the resolution giving general instructions to the Vaccination Officer to prosecute under the Vaccination Acts since that date to the present time; although the Vaccination Committee continues to sit, and has periodically submitted to it the list of defaulters, no prosecutions have been authorised.* The Vaccination Officer informed me that he continues to issue Form A., reminding the parents that they have not had their children vaccinated, but no longer sends out Form B. I was also informed by Dr. Drury, the Public Vaccinator, that in 1892, the number of public vaccinations was insignificant, and that notices had only just been placarded in the town, establishing vaccination stations (*see* Appendix).

HALIFAX BOROUGH HOSPITAL. HALIFAX.

RETURN of CASES of SMALL-POX ADMITTED.

Year.	Cases.	Deaths.	Remarks.
1872	21	4	
1873	6	1	
1874	24	3	Borough, 11; Out Townships, 13.
1875	16	2	Borough, 2; Out Townships, 14.
1876	9	5	
1877–81	No cases.		Compulsory notification enforced.
1882	13	—	
1883	2	—	
1884	1	—	
1885	7	1	
1886	3	—	
1887	3	—	
1888	1	—	
1889	2	—	
1890–91	No cases.		
1892	170	19	
1893 (to April 15)	100	18	

§ 3. *Previous Small-pox in Halifax.*

The subjoined return, kindly furnished to me by Dr. Ainley, gives the number of cases of small-pox admitted into the Halifax Borough Hospital since the year 1872.†

§ 4. *Small-pox at Halifax*, 1892–93.

It will be seen from the subjoined table that cases of small-pox have occurred in Halifax since March 1892, but it was not until the following June that the disease gained any foothold. It will be seen that the lists are drawn up in the form of a "double entry," in order to show the numbers notified in each week, and also those known to have been attacked in that week—notification, of course, being made a few days after the actual onset of illness. I may explain that this list is prepared from the register of cases admitted into hospital which Dr. Ainley kindly placed at my disposal, and the main items in which are given in the Appendix. I have excluded those cases which after admission into hospital were found not to be suffering from small-pox. The column of "unreported cases"—to which I shall again refer—deals with those which came to the knowledge of the sanitary authority in the course of inquiry into the origin of notified cases, and the figures appended to each refer to the first notified case in the table in Appendix that bore this relation. So far as is possible these "unreported cases" have been placed in the weeks in which their occurrence became known, as any attempt to assign them to their "weeks of attack" would necessarily be imperfect.

* By the courtesy of Mr. Longbottom, Clerk to the Guardians, I was permitted to consult the minute books of the Board, from which I made the following excerpts:—

July, 1885.—Resolved, to authorise Mr. Brown, Vaccination Officer, to take proceedings against defaulters, according to the Local Government Board Minute of 31st October 1874.

Amendment to this was lost by 4 to 16 votes.

September 21, 1885.—A resolution to support the Vaccination Committee in not enforcing fines was proposed and lost by a very large majority.

September 7, 1887.—Resolved, to rescind the resolution giving general instructions to the Vaccination Officer to prosecute under the Vaccination Acts.

There voted for, 15; against, 6.

† That this does not quite correspond with the actual prevalence of the disease in the borough seems evident from the fact that in a table of deaths from zymotic disease in the borough of Halifax, 1879–91—contained in the Medical Officer's Report for 1891 (p. 33)—there are six deaths attributed to small-pox in the year 1881, in which year, according to the figures given above, there were no cases of the disease admitted into hospital.

HALIFAX SMALL-POX, 1892–93.

Week of Year.	Ending	Weeks of Attack.		Removed to Hospital.	Weeks of Notification.		Unreported Cases.
		Cases.	Deaths.		Cases.	Deaths.	
	1892.						
X.	March 12	1	—	—	—	—	
XI.	„ 19	—	—	1	1	—	
XII.	„ 26	1	1	—	—	—	
XIII.	April 2	—	—	1	1	1	
XIV.	„ 9	—	—	—	—	—	
XV.	„ 16	—	—	—	—	—	
XVI.	„ 23	2	—	—	—	—	
XVII.	„ 30	—	—	2	2	—	
XVIII.	May 7	3	—	—	—	—	
XIX.	„ 14	1	—	4	4	—	
XX.	„ 21	1	—	1	1	—	
XXI.	„ 28	—	—	—	—	—	
XXII.	June 4	1	—	1	1	—	
XXIII.	„ 11	6	—	1	1	—	
XXIV.	„ 18	13	1	14	14	1	
XXV.	„ 25	2	—	4	4	—	
XXVI.	July 2	2	—	4	3	—	
XXVII.	„ 9	3	—	1	1	—	1 (No. 36).
XXVIII.	„ 16	5	1	3	3	1	
XXIX.	„ 23	4	—	6	5	—	1 (No. 44).
XXX.	„ 30	4	1	2	1	—	1 (No. 47).
XXXI.	August 6	9	1	8	8	2	
XXXII.	„ 13	4	—	7	6	—	1 (No. 62).
XXXIII.	„ 20	5	1	2	2		
XXXIV.	„ 27	4	2	7	7	2	
XXXV.	September 3	3	2	3	2	2	1 (No. 75).
XXXVI.	„ 10	13	—	6	4	1	2 (Nos. 74, 80).
XXXVII.	„ 17	7	—	10	10	—	
XXXVIII.	„ 24	15	2	19	19	2	
XXXIX.	October 1	3	—	2	2	—	
XL.	„ 8	6	2	6	6	—	

Halifax Small-pox, 1892-3—*continued.*

Week of Year.	Ending	Weeks of Attack.		Removed to Hospital.	Weeks of Notification.		Unreported Cases.
		Cases.	Deaths.		Cases.	Deaths.	
	1892.						
XLI.	October 15	1	—	4	4	2	
XLII.	„ 22	6	1	2	1	1	1 (No. 125).
XLIII.	„ 29	5	1	8	8	1	
XLIV.	November 5	1	—	2	2	—	
XLV.	„ 12	4	—	3	3	—	
XLVI.	„ 19	3	—	1	—	—	1 (No. 138).
XLVII.	„ 26	1	—	3	3	—	
XLVIII.	December 3	—	—	1	1	—	
XLIX.	„ 10	13	2	5	4	—	1 (No. 147).
L.	„ 17	9	—	14	13	2	1 (No. 159).
LI.	„ 24	8	1	11	11	1	
LII.	„ 31	3	—	1	1	—	
	1893.						
I.	January 7	13	2	5	4	—	1 (No. 180).
II.	„ 14	12	1	18	17	3	1 (No. 186).
III.	„ 21	13	2	8	6	—	2 (Nos. 202, 211).
IV.	„ 28	10	1	13	13	2	
V.	February 4	6	—	9	8	1	1 (No. 223)
VI.	„ 11	7	—	4	4	—	
VII.	„ 18	11	1	9	10	—	
VIII.	„ 25	8	—	12	12	1	
IX.	March 4	6	1	5	5	—	
X.	„ 11	3	1	7	7	1	
XI.	„ 18	—	—	1	1	1	
XII.	„ 25	5	3	3	3	2	
XIII.	April 1	22	2	2	2	1	
XIV.	„ 8	41	4	60	60	6	
XV.	„ 15	1	—	4	4	—	
		330	37	230	315*	37	16

The monthly incidence of the disease has been as follows, reckoning only those cases which were notified and admitted into hospital :—

1892.	March	2 cases
	April	2 „
	May	5 „
	June	24 „
	July	16 „
	August	23 „
	September	40 „
	October	18 „
	November	9 „
	December	33 „
1893.	January	51 „
	February	30 „
	March	26 „
	April (1st to 8th)	51 „
		330

In 223 of these cases, or about two-thirds, I was enabled to transcribe the entries in the register which referred to the probable source of infection as gleaned by the inquiries made at the time by the sanitary officers. These memoranda are to be found appended to the table in Appendix, and practically constitute the history of the outbreak. I do not propose, therefore, to attempt to write out this history here, but to content myself with a condensed summary of the facts gleaned under this head, which refer to the cases arising from March 1892, to the beginning of February 1893.

An analysis of these memoranda enables us to group the cases under one or other of the eight following categories :—

1. Cases attributed to infection from previous (unreported) cases	62
2. Cases attributed to infection from previous other cases in neighbourhood	23
3. Cases arising in lodging-houses, &c.	39
4. Cases attributed to infection from outside districts	34
5. Cases attributed to infected houses	5
6. Cases sent from union workhouse	8
7. Cases known to be infected at the small-pox hospital	12
8. Cases of which the origin could not be traced	40
	223

I propose to make a few remarks on each of these categories :—

1. It is instructive in many ways to notice how large a proportion of the patients could trace their infection (directly or indirectly) to cases which had been overlooked or missed. Most of these latter were of such a mild type as to have passed unrecognised at the time, and to be unattended by a medical man. There are 16 such foci of infection known, and the number of cases arising from each are :—

In *one* instance	13	cases traceable	to it,	or 13	in all
„ *two* instances	8	„ „	to each of them or	16	„
„ *one* instance	7	„ „	to it	or 7	„
„ *one* „	5	„ „	to it	or 5	„
„ *three* instances	4	„ „	to each of them or	12	„
„ *one* instance	2	„ „	to it	2	„
„ *seven* instances	1	„ „	to each of them or	7	„
				62	

The appended diagram (Pl. XXIX.) shows the relationship of those groups in which four or more cases occurred. It will be observed that in most instances the infection was apparently direct from the first case which remained unrecognised in the family circle; but in the larger series, and particularly in that where 13 persons seem to have been infected (Group A.), one of those primarily attacked, a mill hand (No. 40), apparently infected five others (Nos. 53, 55, 56, 57, and 59), who were fellow workers at the same mill. Of the rest Nos. 36 and 38 visited the infected household, No. 36 in turn infecting No. 45, who lived with her. No. 42 helped to "lay out" the child who died, and who was supposed to have given rise to the whole series; whilst the fatal (unvaccinated) case, No. 65, was a person who lived close to the originally infected house.

It is hardly necessary to describe in turn each of these several groups, the facts referring to which are to be found in the table (Appendix IV.); but I may, perhaps, mention the following instructive example of the manner in which small-pox may be disseminated, the particulars of which were related to me by Dr. Ainley. In the middle of December an old woman died from cerebral apoplexy, which supervened (as was subsequently ascertained) during an attack of small-pox, of which two other cases occurred in the same house, one developing subsequently to her illness, and the other a lad of 15 years, who when seen had the marks of a recent eruption on his face, but who had never consulted a medical man, and had continued at his work in a carpet factory. The lad said that no one had been ill at these works, but when the books were examined it was found that some of the hands had been absent from illness about the same time. Amongst the visitors to the

HALIFAX. SMALL POX 1892-3.

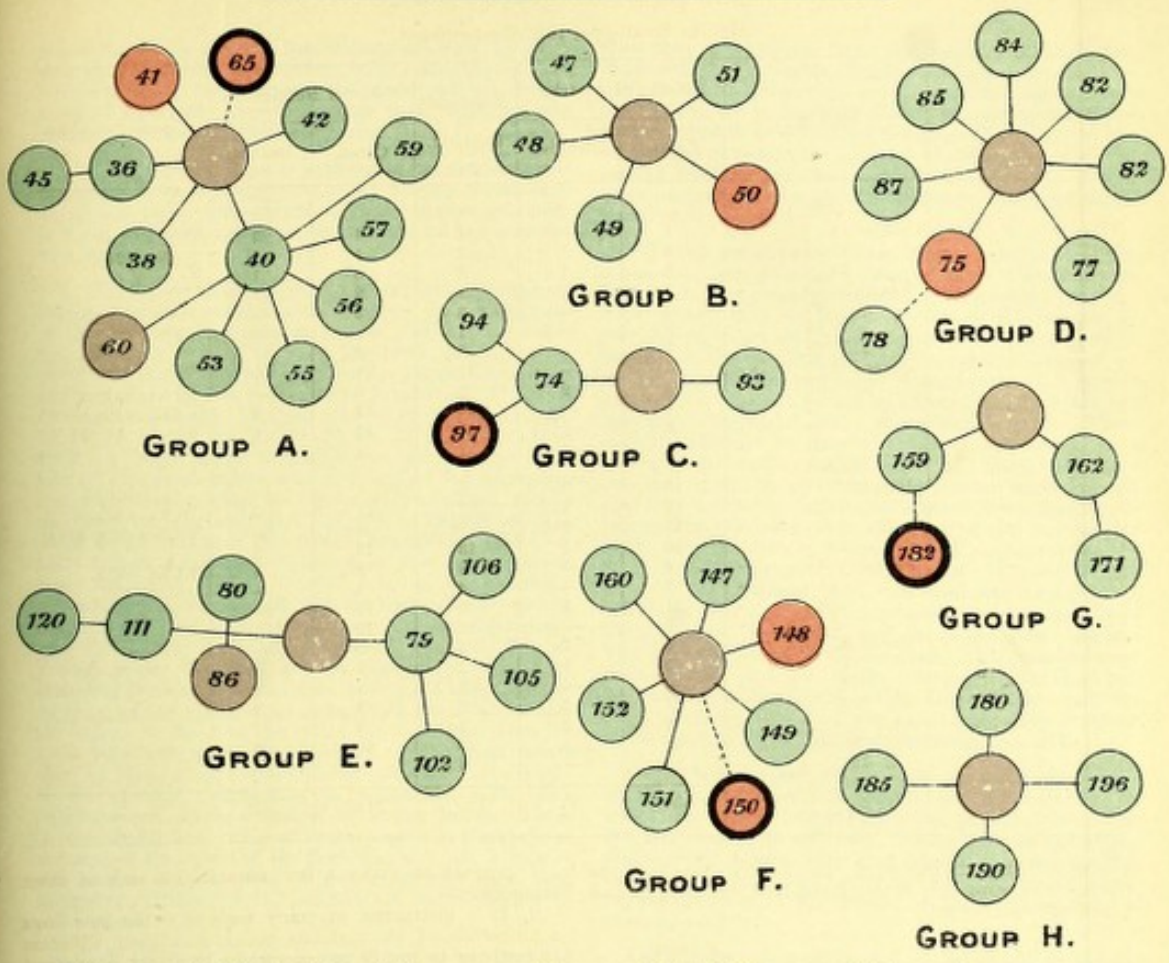


Diagram to Illustrate certain groups of cases of Small Pox in which each case was considered to be directly or indirectly related to a common focus of infection that had escaped observation.

Numerals refer to Table of Cases in Appendix IV.

Vaccinated
Unvaccinated
Vaccination doubtful

Fatal Cases indicated by thick border.

Plate XXX.

HALIFAX. SMALL POX 1892.

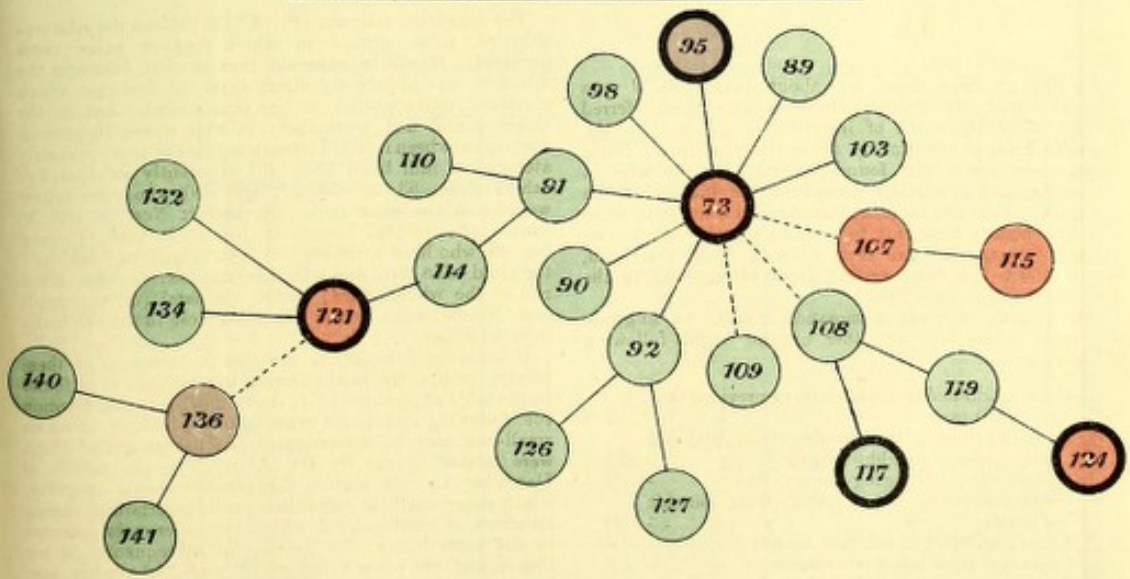


Diagram to Illustrate the probable infection-relations of a series of cases of Small Pox occurring in connexion with the inmates of a Model Lodging House at Halifax.

The first case (No 73) was attacked on September 22nd 1892, the last in the group (No 141) on December 2nd 1892.

Numerals refer to Table of Cases in Appendix IV.

Vaccinated
Unvaccinated
Vaccination doubtful

Fatal Cases indicated by thick border.

Wyman & Sons, Lt. Lith. 63, Carter Lane 3013-2-97.

house during the woman's fatal illness, one from Keighley developed small-pox on her return home; one (the patient's son) came from Leicester, and also developed the disease there a fortnight later;* another from Barnsley was similarly attacked after returning home.

2. Of this group there is nothing to say except that it comprises cases which although not directly traceable to antecedent cases, yet occurred in houses in near proximity to these, and may, therefore, be supposed to be connected with them.

3. Thirty-nine cases appear to have been traceable to lodging-houses or places of public resort. One large group of this kind was in connexion with a public-house much frequented by persons entering the town, and it is supposed that the disease was introduced amongst the inmates and customers by one coming from Brighouse. There are 15 cases attributed to this one place of resort (Nos. 13, 14, 15, 16, 17, 18, 19, 24, 25, 26, 27, 28, 30, 31, 32) in June 1892. A large model lodging-house was infected by a man of dissipated habits, who first applied for admission into the infirmary, where his disease was recognised, and he was taken into the small-pox hospital on September 5th, where he died the next day from confluent small-pox (No. 73). Eleven other cases occurred at this lodging-house from September 13th to October 4th, but it is somewhat difficult to connect them all with the first case removed on the 5th, when the room occupied by him was disinfected. (*See* Pl. XXX.) It seems probable also that the infirmary porter (No. 89) and an out-patient (No. 113) attending there at the same time as No. 73 were infected by him; at any rate the one sickened on the 13th day and the other on the 16th day after the man had been for some time waiting at the infirmary. The record points also to nine other persons being attacked subsequent to 4th October, apparently in connexion with this lodging-house, giving a total of 25 in this group. There is no knowing how many of those present in the house at the time of the illness of the first case, who left before he was sent to hospital (four or five days), may have been themselves infected or the medium of the contagion to other places.

4, 5, 6. Of these classes it may suffice to say that the earliest cases occurred in families of men engaged in business at Dewsbury, where small-pox was then prevalent (June 1892), and that inquiry into the histories of cases show that importations have also occurred from Batley, Huddersfield, Whitegate, Brighouse, Ripponden, Rotherham, Battyeford, Keighley, and Lightcliffe. As to house infection, in one instance the disease was contracted by the man engaged in lime-washing the house (No. 130); in two other cases through the medium of customers at a shop coming from an infected house (Nos. 135, 157). A few cases occurred in the union workhouse and were transferred to the hospital.

7. Twelve persons were known to have received infection at the small-pox hospital.† Two of them (Nos. 126 and 127) have been already included in the model lodging-house group; they were visited by one of the inmates of this lodging-house within a few hours of his discharge from hospital on October 9th, and were themselves attacked on the 21st and 23rd respectively. A third case with a similar history (No. 104) was visited by a friend who had just left hospital, a fortnight before she herself took ill. Three patients admitted to hospital sickened with small-pox a fortnight afterwards (Nos. 33, 37, 113). These cases have not been entered in my list twice, as it seems more probable that they were suffering from some other illness than small-pox on first admission than that they should be examples of the rare condition of re-infection. Five persons (34, 58, 67, 118, 137) engaged in work about the hospital (not any of the resident staff, but workmen engaged on buildings, each of whom had refused re-vaccination) were attacked with the disease, and also a post-office employé who delivered letters at the hospital. This man had been re-vaccinated, and Mr. Ainley informs me that there had been two insertions, one of which did not take, and the other was represented by a very small scar. The daughter of the nospital porter completes the series (No. 66).

8. The last category, that of cases in which the source of infection could not be traced, has been materially increased (so I am informed) since the period embraced by the 233 cases here analysed. There is much probability that a certain number have been infected from the hospital, and at my request Mr. Ainley had a map prepared showing the incidence of the disease in the neighbourhood of the hospital.‡

The number of cases treated in the small-pox hospital up to the date of my second visit was 330, of whom 200 were males and 130 females. There died 37 (23 males, 14 females), and there still remained under treatment 70 (44 males and 26 females).

* I saw this young man, C. G., in the Leicester Small-pox Hospital suffering from a mild attack of variola. He had gone to Halifax to see his mother on December 19, and after her death on the 25th he accompanied his sister to Keighley for a few days, returning to Leicester on January 2nd. He was taken ill at Keighley, and the rash came out on the day of his departure from that place. He was admitted into the Leicester Hospital on January 3rd.

† In respect to those apparently infected by patients after their discharge, it should be said that there was no efficient means of disinfection in force at the hospital until November 1892.

‡ This map, I am informed, was handed to the Inspector to the Local Government who was sent to report on the hospital.

HALIFAX.—SMALL-POX, 1892-93.—SEX AND AGE INCIDENCE.

——	Males.			Females.			Both Sexes.			Total.
	Recovered.	Died.	In Hospital.	Recovered.	Died.	In Hospital.	Recovered.	Died.	In Hospital.	
1 year	—	3	—	3	2	—	3	5	—	8
1-5 years	5	2	3	5	7	1	10	9	4	23
5-10 „	2	—	—	7	1	2	9	1	2	12
10-15 „	4	1	3	5	—	2	9	1	5	15
15-20 „	19	2	2	12	—	2	31	2	4	37
20-30 „	43	1	14	29	2	6	72	3	20	95
30-40 „	32	6	10	18	—	10	50	6	20	76
40-50 „	18	6	9	6	1	3	24	7	12	43
50-60 „	8	—	3	3	1	—	11	1	3	15
60-70 „	3	2	—	1	—	—	4	2	—	6
Total	133	23	44	90	14	26	223	37	70	330
	200			130			330			

HALIFAX.

Arranged in the age-groups of (*a*) under 10 years, (*b*) 10 to 30 years, and (*c*) 30 years and upwards, the above figures come out as follows:—

	Recovered.	Died.	Remaining in Hospital.	
Under 10 years	32	15	6	43
10 to 30 years	112	6	29	147
30 years and upwards	89	16	35	140
Total	223	37	70	330

Although, as a matter of fact I believe all those who were "still in hospital" at my visit have since been discharged recovered, it may be more correct to calculate the mortality rate on those cases which were completed up to that date. These amount to 260, with 37 deaths, a mortality of 14·2 per cent.,* and in each group:—

Age.	Cases.	Deaths.	Mortality.
			Per cent.
Under 10 years	37	15	40·5
10 to 30 years	118	6	5·08
30 years and upwards	105	16	15·2

* Or 11·2 per cent. on whole number admitted.

TYPE OF ATTACK, WITH REFERENCE TO AGE.

	Confluent.			Semi-confluent.			Discrete.			Total.
	Recovered.	Died.	Still in Hospital.	Recovered.	Died.	Still in Hospital.	Recovered.	Died.	Still in Hospital.	
Under 1 year	—	3	—	2	—	—	1	2	—	8
1–5 years	3	7	—	6	2	3	1	—	1	23
5–10 „	2	1	1	2	—	—	5	—	1	12
10–15 „	—	1	—	1	—	1	8	—	4	15
15–20 „	2	2	—	2	—	1	27	—	3	37
20–30 „	6	2	—	8	—	2	58	1	18	95
30–40 „	4	6	—	11	—	6	35	—	14	76
40–50 „	3	7	2	4	—	4	17	—	6	43
50–60 „	1	1	—	—	—	—	10	—	3	15
60–70 „	—	2	—	—	—	—	4	—	—	6
Total	21	32	3	36	2	17	166	3	50	330

It thus appears that of 56 "confluent" attacks there were no fewer than 32 fatal cases or $\frac{4}{7}$ths; of 55 "semi-confluent there were 2 fatal cases, or 1 in 27·5; and of 219 "discrete" there were 3 fatal cases, or 1 in 73.

The average stay in hospital of those who recovered was:—

Of the 21 confluent cases - - 56·5 days.
36 semi-confluent cases - 40·4 „
166 discrete cases - - 22·8 „

DISTRIBUTION OF CASES WITH RESPECT TO VACCINATION.

	Vaccinated.			No Information.			Alleged.			Unvaccinated.			Total.		
	Recovered.	Died.	Still in Hospital.	Recovered.	Died.	Still in Hospital.	Recovered.	Died.	Still in Hospital.	Recovered.	Died.	Still in Hospital.	Recovered.	Died.	Still in Hospital.
Under 1 year	—	—	—	—	—	—	—	—	—	3	5	—	3	5	—
1–5 years	1	—	—	—	—	1	—	—	—	9	9	3	10	9	4
5–10 „	2	—	1	—	—	—	—	—	—	7	1	1	9	1	2
10–15 „	8	—	4	1	—	—	—	—	—	—	1	1	9	1	5
15–20 „	29	1	4	1	—	—	—	—	—	1	1	—	31	2	4
20–30 „	66	1	19	4	—	—	—	—	—	2	2	1	72	3	20
30–40 „	47	2	29	2	—	—	—	1	—	1	3	—	50	6	29
40–50 „	23	4	12	—	1	—	—	—	—	1	2	—	24	7	12
50–60 „	9	1	3	2	—	—	—	—	—	—	—	—	11	1	3
60–70 „	3	1	—	1	—	—	—	—	—	—	1	—	4	2	—
Total	188	10	63	11	1	1	—	1	—	24	25	6	223	37	70

From the above table it will be seen that 55 of the patients were known to be unvaccinated, and that of them 25 died, or 1 out of every 2·2 cases; whereas of the cases known to be vaccinated, 261 in number, there were 10 deaths, or 1 out of every 26·1 cases; no information or only doubtful evidence as to vaccination occurring in 13 cases (one death), and no evidence of vaccination in a patient alleged to have been vaccinated in one (fatal) case. Further scrutiny shows that the only patients under 1 year of age were amongst the unvaccinated, five out of eight cases proving fatal; that between the ages of 1 and 10, there were only 4 vaccinated (no deaths), but 30 unvaccinated (10 deaths); and of the rest, between 10 years and 30 years, 132 were vaccinated (2 deaths), 9 were unvaccinated (4 deaths), and of 6 no information is given as to vaccination. At the ages of 30 and upwards, 76 were vaccinated (8 deaths); 8 were unvaccinated (6 deaths); 6 "no information" (1 death); and in one (fatal) case there was no evidence of an alleged vaccination.

A further analysis of the type of attack and the vaccination conditions gives the figures stated in the following table:—

TYPE OF ATTACK AND VACCINATION RELATIONS.

	Confluent.					Semi-confluent.				Discrete.				Total.				
	Vaccinated.	No Information.	Alleged Vaccination.	Unvaccinated.	Total.	Vaccinated.	No Information.	Unvaccinated.	Total.	Vaccinated.	No Information.	Unvaccinated.	Total.	Vaccinated.	No Information.	Alleged Vaccination.	Unvaccinated.	—
Under 1 year	—	—	—	3	3	—	—	2	2	—	—	3	3	—	—	—	8	8
1–5 years	—	—	—	10	10	—	1	10	11	1	—	1	2	1	1	—	21	23
5–10 „	—	—	—	4	4	—	—	2	2	3	—	3	6	3	—	—	9	12
10–15 „	—	—	—	1	1	1	—	1	2	11	1	—	12	12	1	—	2	15
15–20 „	2	—	—	2	4	3	—	—	3	29	1	—	30	34	1	—	2	37
20–30 „	2	2	—	4	8	10	—	—	10	74	2	1	77	86	4	—	5	1
30–40 „	6	—	1	3	10	17	—	—	17	46	2	1	49	69	2	1	4	76
40–50 „	8	1	—	3	12	8	—	—	8	23	—	—	23	39	1	—	3	43
50–60 „	2	—	—	—	2	—	—	—	—	11	2	—	13	13	2	—	—	15
60–70 „	1	—	—	1	2	—	—	—	—	3	1	—	4	4	1	—	1	6
Total	21	3	1	31	56	39	1	15	55	201	9	9	219	261	13	1	55	330

Thus of the—

56 confluent cases, 37·5 per cent. were vaccinated, 55·3 per cent. unvaccinated.

55 semi-confluent cases, 70·9 per cent. were vaccinated, 27·2 per cent. unvaccinated.

219 discrete cases, 91·8 per cent. were vaccinated, 4·1 unvaccinated.

A further analysis of the "vaccinated" according to the number of marks is given in Appendix I. It will be seen that of—

21 confluent cases, 17, or 80·9 per cent., had 3 marks or fewer, and 4, or 19·1 per cent., from 4 to 6 marks.

39 semi-confluent cases, 33, or 82·5 per cent., had 3 marks or fewer, and 6, or 15·4 per cent., from 4 to 6 marks.

201 discrete cases, 167, or 83·5 per cent., had 3 marks or fewer, and 34, or 16·9 per cent., from 4 to 6 marks.

Or of the whole number (261) of vaccinated persons contracting small-pox—

217, or 83·1 per cent., had 3 marks or less, and

44, or 16·9 per cent., had from 4 to 6 marks.

Finally, I may allude to the fact that as the outbreak has progressed, vaccination and re-vaccination have increased in the borough. On my first visit Dr. Drury, the Public Vaccinator, had informed me that bills had just been posted announcing the opening of vaccination stations, and about the time of my second visit he was himself engaged in a house-to-house visitation of the part of the borough most infected with small-pox for the purpose of advising and carrying out vaccination of those who had not been vaccinated hitherto. He has since, I believe, put the Commission in possession of his experience on this head. The Medical Officer of Health was also good enough to make inquiries of the medical profession in the town as to the numbers of cases vaccinated by them during the outbreak, and handed to me the return which will be found in the Appendix III.

CONCLUSIONS.

1. When small-pox first appeared in Halifax, the sanitary organisation was in a less complete state than it subsequently became. The Medical Officer of Health up to that time also engaged in private practice, and there is no doubt that his being required to limit his work to the duties of his office has been advantageous.

2. The provision for isolation of patients was inadequate, but as the epidemic progressed this was remedied, the drawback being, however, that the whole of the Fever Hospital had to be given up to small-pox. The site of the hospital is not suitable for small-pox, and the corporation have since taken steps to transfer it.

3. The means for disinfection have been extended and improved.

4. The sanitary department has worked zealously and vigorously during this outbreak, and a large proportion of cases have been traced to their origin.

5. Re-vaccination was for some time but little practised, except in public institutions, and at the hands of private practitioners; but the opening of fresh stations and the steps taken by the Sanitary Committees ensured a large accession to the number of the re-vaccinated in May 1893.

I desire to thank Mr. Ainley for the care and trouble he has taken to render this report complete so far as it goes.

London July 1, 1893. S.C.

HALIFAX.

LIST OF APPENDICES.

I. *Analysis of Cases of Small-pox amongst Vaccinated Persons.*

II. *Table of Fatal Cases.*

III. *Return of Vaccinations and Re-vaccinations by Medical Men, from May 1892 to February 13, 1893.*

IV. *Return by Mr. Ainley of all cases admitted to Hospital, 1893.*

V. *Table of Cases of Small-pox, 1892–3 (compiled from the Hospital Register).*

VI. *Halifax Union.—Return of Vaccinations, 1872–1892.*

APPENDIX I.

VACCINATED CLASS.—NUMBER OF MARKS

—	Confluent.						—	Semi-confluent.						—	Discrete.						—	—						—
	1.	2.	3.	4.	5.	6.		1.	2.	3.	4.	5.	6.		1.	2.	3.	4.	5.	6.		1.	2.	3.	4.	5.	6.	
Under 1 year	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1 to 5 years	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	1	—	—	—	1	—	—	1
5–10 „	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	—	—	—	3	—	—	3	—	—	—	3
10–15 „	—	—	—	—	—	—	—	1	—	—	—	—	—	1	2	2	5	1	—	1	11	3	2	5	1	—	1	12
15–20 „	1	—	—	—	—	1	2	—	1	—	2	—	—	3	—	3	19	6	1	—	29	1	4	19	8	1	1	34
20–30 „	—	—	1	1	—	—	2	1	4	4	—	1	—	10	6	23	32	7	4	2	74	7	27	37	8	5	2	86
30–40 „	2	2	1	1	—	—	6	1	7	8	—	—	1	17	9	18	15	2	1	1	46	12	27	24	3	1	2	69
40–50 „	—	5	2	—	1	—	8	1	2	3	—	1	1	9	4	6	7	3	1	2	23	5	13	12	3	3	3	39
50–60 „	—	2	—	—	—	—	2	—	—	—	—	—	—	—	3	1	6	1	—	—	11	3	3	6	1	—	—	13
60–70 „	—	—	1	—	—	—	1	—	—	—	—	—	—	—	1	1	1	—	—	—	3	1	1	2	—	—	—	4
Total	3	9	5	2	1	1	21	4	14	15	2	2	2	39	25	74	88	21	7	6	201	32	77	108	25	10	9	261

APPENDIX II.

HALIFAX, 1892–93.

FATAL CASES OF SMALL-POX.

—	Under 1 Year.	1 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	Total.
Vaccinated:—											
1 mark	—	—	—	—	1	—	—	—	—	—	1
2 marks	—	—	—	—	—	—	2	3	1	—	6
3 „	—	—	—	—	—	—	—	—	—	1	1
4 „	—	—	—	—	—	1	—	—	—	—	1
5 „	—	—	—	—	—	—	—	1	—	—	1
No information as to vaccination.	—	—	—	—	—	—	—	1	—	—	1
Stated to have been vaccinated. No marks.	—	—	—	—	—	—	1	—	—	—	1
Unvaccinated	5	9	1	1	1	2	3	2	—	1	25
Total	5	9	1	1	2	3	6	7	1	2	37

APPENDIX III.

HALIFAX.

VACCINATION.

From May 1892 to February 13, 1893.

No.	Name of Medical Man.	No. of Persons Vaccinated.		No.	Name of Medical Man.	No. of Persons Vaccinated.	
		Primary.	Re-vaccinated.			Primary.	Re-vaccinated.
1	Adams, John A.	6	49	5	Montgomery	40	12
2	Bradbury, A. F.	8	47	6	Morton, Andrew	7	8
3	Cookson, H. A.	20	30	7	Robertson	2	24
4	Crowther, G. D.	7	95	8	Smith, Henry	20	50
5	Davidson, Rolt	30	30	9	„ W. C. F.	80	150
6	Dolan, T. M. (Workhouse)	27	420	20	Symes, E. West	9	68
7	Ellis, Ed.	30	45	1	Topham, A. S.	12	60
8	Guthrie, J. A.	25	55	2	Waite	—	—
9	Hackett, E. H.	1	24	3	Ainley, D.	5	55
10	Henry, McWilliams G.	7	8	4	—	—	2
1	Kennedy	4	24	5	Strickland, F. G.	30	150
2	Leech, Priestley	10	21	6	Mantle, A.	4	53
3	Lockwood	3	46	7	Wright, J. H.	27	382
4	Marshall, Jas.	7	6	8	Oakley, J.	27	135

APPENDIX IV.

NUMBER OF CASES ADMITTED TO SMALL-POX HOSPITAL.

—	Under 5 years.		5–10.		10–20.		20–30.		30–40.		40 and upwards.		All Ages.		Totals.
	Vaccinated.	Unvaccinated.	Vaccinated.	Unvaccinated.	Vaccinated.	Unvaccinated.	Vaccinated.	Unvaccinated.	Vaccinated.	Unvaccinated.	Vaccinated.	Unvaccinated.	Vaccinated.	Unvaccinated.	
Discrete	No cases.	5	4	4	69	—	122	—	78	—	56	—	329	9	338
Semi-confluent		20	—	4	12	2	16	—	24	—	6	—	58	26	84
Confluent		25	—	9	5	3	8	5	12	6	13	5	38	53	91
Total Cases	—	50	4	17	86	5	146	5	114	6	75	5	425	88	513
Total Deaths	—	20	—	2	1	1	1	3	1	6	5	4	8	36	44
Mortality per cent. of cases.	—	40·0	0·0	11·7	1·1	20·0	0·6	60·0	0·8	100·0	6·6	80·0	1·8	40·9	8·5

Two cases of re-vaccinated persons: first re-vaccinated inefficiently 5 years ago; second re-vaccinated 34 years ago. Officials.—One only attacked and that during first week of epidemic, not re-vaccinated; all others re-vaccinated and none attacked.

APPENDIX IV.

TABLE OF CASES OF SMALL-POX, 1892–93.

(Compiled from the Hospital Register.)

No.	Name.	Sex.	Age.	Notification.	Onset.	Removal to Hospital.	Type of Attack.	Date of Discharge.	Result.	Days in Hospital.	Vaccination.	Other Inmates of House.				Remarks as to Source of Infection, &c.
												Number.	Vaccinated.	Unvaccinated.	Re-vaccinated.	
1	W. N. F.	M.	45	Mar. 18, 1892	Mar. 12	Mar. 16	Discrete	May 2	Recovered	48	3 marks	2	—	—	—	Been on visit to Dewsbury.
2	E. F.	F.	42	„ 28	„ 26	„ 28	Confluent	April 7	Died	11	2 „	—	—	—	—	From No. 1.
3	A. E. M.	M.	19	Apr. 28	Apr. 22	Apr. 25	Discrete	May 28	Recovered	34	2 „	6	—	—	—	Origin?
4	M. D.	F.	2	„ 30	„ 23	„ 26	Semi-confluent	June 11	„	43	*Unvaccinated*	4	3	1	1	Probably from father who was travelling at Dewsbury.
5	M. B.	F.	23	May 8	May 5	May 8	Discrete	May 28	„	21	2 marks	4	—	—	—	Visiting at Clifton.
6	M. D.	F.	½	„ 11	—	„ 11	Semi-confluent	June 11	„	32	*Unvaccinated*	—	—	—	—	From No. 4.
7	W. S.	M.	27	„ 13	—	„ 13	Discrete	May 28	„	16	Not known	2	2	—	1	Removed No. 4 to hospital.
8	M. M.	F.	39	„ 14	May 12	„ 14	„	June 11	„	29	2 marks	6	—	—	—	At No. 4's house.
9	M. A. L.	F.	44	„ 18	„ 15	„ 17	„	„ 25	„	40	3 marks	6	—	—	—	
10	W. A.	M.	32	June 4	June 1	June 3	„	„ 27	„	25	Not known	2	2	—	—	At Brighouse.
11	J. O.	M.	23	„ 11	„ 9	„ 11	„	„ 27	„	17	3 marks	4	4	—	2	—
12	Mrs. A.	F.	29	„ 13	—	„ 13	Confluent	August 5	„	54	—	—	—	—	—	Wife of No. 10.
13	J. D.	M.	34	„ 14	June 11	„ 14	Discrete	July 6	„	23	1 mark	7	4	3	4	Inmates of B. Hotel; probably infected by persons from Brighouse.
14	C. D.	F.	39	„ 14	„ 13	„ 14	„	June 29	„	16	—	—	—	—	—	
15	J. D.	M.	12	„ 14	„ 11	„ 14	„	„ 29	„	16	—	—	—	—	—	
16	J. F.	M.	38	„ 14	„ 12	„ 14	Confluent	„ 29	Died	16	*Unvaccinated*	—	—	—	—	
17	J. W.	M.	19	„ 20	„ 11	„ 14	Discrete	July 2	Recovered	19	4 marks	8	8	—	3	Visited the B. Hotel.
18	W. F.	M.	29	„ 15	„ 13	„ 15	Semi-confluent	August 5	„	52	2 „	2	2	—	1	
19	A. M.	M.	27	„ 15	„ 14	„ 15	Discrete	June 29	„	15	—	2	—	—	—	
20	E. M.	F.	13	„ 15	„ 13	„ 15	„	July 23	„	39	2 marks	7	7	—	—	Origin?
21	A. M.	F.	10	„ 15	„ 15	„ 15	„	„ 23	„	39	1 mark	—	—	—	—	„
22	W. F.	M.	16	„ 16	„ 9	„ 15	„	„ 2	„	18	3 marks	1	1	—	—	Visited house of Nos. 10 and 12.
23	F. L.	M.	42	„ 16	—	„ 16	„	„ 15	„	30	3 „	—	—	—	—	From workhouse (visited the B. Hotel).
24	E. P.	F.	20	„ 17	June 15	„ 17	„	„ 2	„	16	3 „	2	2	—	1	Husband travelling at Brighouse.
25	W. E.	M.	38	„ 17	„ 14	„ 17	„	„ 6	„	20	3 „	1	1	—	—	Visiting B. Hotel.
26	G. H. H.	M.	34	„ 19	„ 18	„ 19	Semi-confluent	August 1	„	44	2 „	7	7	—	—	
27	W. H. S.	M.	30	„ 19	„ 18	„ 19	Discrete	July 6	„	18	2 „	1	1	—	—	House adjoins B. Hotel.
28	J. W.	M.	38	„ 21	„ 18	„ 21	Semi-confluent	August 1	„	42	2 „	6	6	—	—	Visiting B. Hotel.
29	E. L.	F.	35	„ 22	„ 16	„ 22	Discrete	July 27	„	36	*Unvaccinated*	4	4	—	3	—

No.	Name.	Sex.	Age.	Notification.	Onset.	Removal to Hospital.	Type of Attack.	Date of Discharge.	Result.	Days in Hospital.	Vaccination.	Other Inmates of House.				Remarks as to Source of Infection, &c.
												Number.	Vaccinated.	Unvaccinated.	Re-vaccinated.	
30	S. A. E.	F.	35	June 29	June 25	June 28	Discrete	August 1	Recovered	35	1 mark	—	—	—	—	No. 25; same house.
31	M. H. B.	F.	34	„ 30	„ 25	„ 28	„	„ 1	„	35	3 marks	2	2	—	2	At B. Hotel.
32	H. R.	M.	28	„ 30	„ 27	„ 28	„	July 25	„	28	1 mark	8	8	—	1	At B. Hotel.
33	J. H.	M.	25	—	„ 27	„ 30	„	„ 29	„	30	5 marks	2	2	—	—	Infected at hospital, where admitted in error, June 18.
34	J. T.	M.	21	July 8	July 2	July 8	„	„ 19	„	12	3 „	1	1	—	—	Erecting hospital tents.
35	J. N.	M.	19	„ 12	„ 8	„ 12	„	„ 22	„	11	3 „	5	5	—	—	Not known.
36	M. A. R.	F.	17	„ 13	„ 8	„ 13	„	Aug. 1	„	20	3 „	3	3	—	3	Probably from an unreported case at W.'s J. Terrace.
37	M. C.	F.	4	„ 14	—	„ 15	Confluent	July 22	Died	8	*Unvaccinated*	5	5	—	5	At hospital, where admitted in error, June 29.
38	J. H.	M.	32	„ 17	„ 14	„ 17	„	Sept. 10	Recovered	56	2 marks	1	1	—	1	Visited at W.'s (v. No. 36).
39	J. P.	M.	44	„ 18	„ 14	„ 17	„	„ 13	„	59	3 „	3	3	—	3	Carting wood in infected house at Brig-house.
40	E. H.	F.	16	„ 18	„ 17	„ 20	Discrete	Aug. 22	„	33	4 „	9	8	1	—	A work fellow at H.'s mill with daughter of W. (v. No. 36).
41	J. L.	M.	19	„ 20	„ 14	„ 19	Confluent	„ 31	„	44	*Unvaccinated?*	8	8	—	—	Visited at W.'s (v. No. 36).
42	F. B.	F.	58	„ 25	„ 15	„ 19	Discrete	July 29	„	11	1 mark	3	3	—	—	Helped to lay out W.'s dead child (v. No. 36)
43	L. P.	F.	16	„ 23	„ 18	„ 21	„	Aug. 6	„	17	3 marks	—	—	—	—	From father, J. P., No. 39.
44	H. M. T.	F.	24	„ 25	„ 23	„ 25	„	„ 27		34	2 „	2	2	—	—	From husband (unreported), who caught small-pox from his brother.
45	W. W.	M.	40	„ 26	„ 22	„ 26	Semi-confluent	„ 27	„	33	3 „	—	—	—	—	Same house as No. 36.
46	G. I.	M.	33	„ 31	„ 28	„ 31	Confluent	„ 11	Died	12	Alleged vaccination. No marks.	2	2	—	—	From No. 35.
47	J. G.	M.	32	Aug. 4	„ 27	Aug. 4	Discrete	„ 22	Recovered	19	2 marks	5	5	—	1	From his brother, H. G. (unreported).
48	H. G.	F.	35	„ 4	„ 29	„ 4	„	„ 17	„	14	6 „	—	—	—	—	From H. G.
49	E. G.	F.	40	„ 4	„ 29	„ 4	„	„ 22	„	19	5 „	—	—	—	—	„
50	M. W. T.	M.	9	„ 4	Aug. 1	„ 4	Confluent	Sept. 14	„	42	*Unvaccinated*	—	—	—	—	„
51	F. S.	M.	18	„ 11	„ 1	„ 4	Discrete	Aug. 15	„	12	2 marks	5	5	—	—	„ (his master).
52	J. W. P.	M.	2	„ 4	„ 3	„ 5	Semi-confluent	Sept. 10	Died	37	*Unvaccinated*	3	3	—	3	Mother removed to Sowerby Br. Hospital.
53	H. M.	M.	48	„ 6	„ 3	„ 5	Discrete	Aug. 24	Recovered	20	2 marks	2	2	—	2	Works at H.'s mill (v. No. 40).
54	S. E.	M.	18	„ 12	„ 3	„ 8	„	„ 22	„	15	3 „	3	3	—	2	Other cases in neighbourhood.
55	D. F.	M.	37	„ 8	„ 4	„ 8	„	„ 27	„	20	1 mark	5	3	2	2	Works at H.'s mill (v. Nos. 40 and 53).
56	M. W.	F.	30	„ 10	„ 4	„ 9	Semi-confluent	Oct. 1	„	54	2 marks	1	1	—	—	„ „
57	M. H.	F.	24	„ 9	„ 6	„ 9	„	„ 1	„	54	2 „	1	1	—	—	„ „
58	J. C.	M.	34	„ 10	„ 6	„ 10	„	Sept. 14	„	56	3 „	2	2	—	2	Employed in painting Small-pox Hospital.
59	R. S.	M.	22	„ 10	„ 7	„ 10	Discrete	„ 4	„	26	3 „	4	4	—	1	Works at H.'s mill (v. Nos. 40, 53, &c.).
60	T. F. G.	M.	28	„ 10	„ 7	„ 10	Confluent	„ 27	„	47	Vaccination doubtful.	4	4	—	3	„ „

HALIFAX.

No.	Name.	Sex.	Age.	Notification.	Onset.	Removal to Hospital.	Type of Attack.	Date of Discharge.	Result.	Days in Hospital.	Vaccination.	Other Inmates of House.				Remarks as to Source of Infection, &c.
												Number.	Vaccinated.	Unvaccinated.	Re-vaccinated.	
61	M. L.	F.	40	Aug. 13	Aug. 11	Aug. 14	Confluent	Oct. 26	Recovered	74	2 marks	1	1	—	—	Visited at Whitegate.
62	Mrs. W.	F.	22	„ 16	„ 10	„ 16	Discrete	Sept. 2	„	18	4 „	1	1	—	—	From husband (unreported).
63	Mrs. B.	F.	42	„ 22	„ 18	„ 22	„	„ 9	„	19	1 mark	4	4	—	4	Other cases in neighbourhood.
64	C. H.	M.	2	„ 22	„ 18	„ 22	Semi-confluent	„ 29	„	39	*Unvaccinated*	6	6	—	5	„ „
65	B. D.	F.	8	—	„ 20	„ 23	„	„ 9	Died	18	„	—	—	—	—	Live in J. Terrace where W. (No. 36).
66	L. V.	F.	19	Aug. 24	„ 19	„ 23	Discrete	„ 14	Recovered	23	3 marks	2		—	1	Daughter of hospital porter.
67	H. N.	M.	50	„ 31	„ 18	„ 23	„	„ 7	„	16	1 mark	—	—	—	—	Working at hospital as mason.
68	W. H. T.	M.	42	„ 25	„ 22	„ 25	Confluent	Aug. 31	Died	7	*Unvaccinated*	2	2	—	—	Not known.
69	S. M.	M.	2	„ 27	„ 22	„ 26	Semi-confluent	Oct. 17	Recovered	53	„	4	4	—	—	Cases in neighbourhood.
70	S. A. H.	F.	22	„ 27	„ 24	„ 31	Discrete	Sept. 15	„	16	3 marks	2	2	—	—	„ „ „
71	W. C.	M.	60	„ 31	„ 27	„ 31	Confluent	„ 6	Died	7	3 „	2	2	—	2	„ „ „
72	B. H.	F.	3 days	Sept. 12	„ 1	„ 31	Discrete	„ 14	„	15	*Unvaccinated*	—	—	—	—	From No. 70.
73	T. S.	M.	60	„ 5	Sept. 2	Sept. 5	Confluent	„ 6	„	2	„	90	—	—	—	In model lodging-house; infected at Brighouse.
74	S. D.	F.	30	„ 8	„ 4	„ 8	Discrete	„ 25	Recovered	18	2 marks	5	3	2	—	From case not reported.
75	A. W.	F.	3	„ 9	„ 3	„ 8	Semi-confluent	Oct. 15	„	38	*Unvaccinated*	4	3	1	2	Travelled to Bridlington with G. (unreported).
76	W. T.	M.	50	„ 16	„ 7	„ 9	Discrete	Sept. 22	„	14	Vaccination doubtful, 2 marks	—	—	—	—	Sent from Halifax Union.
77	W. C.	M.	28	„ 12	„ 8	„ 10	„	„ 22	„	13	2 „	2	2	—	—	Visited at G.'s (v. No. 75).
78	J. W.	M.	28	„ 12	„ 9	„ 10	„	Oct. 15	„	36	2 „	—	—	—	—	Father of No. 75.
79	W. E.	M.	29	„ 11	„ 7	„ 11	„	„ 18	„	35	3 „	4	4	—	—	From husband of No. 80.
80	H. M. H.	F.	25	„ 12	„ 8	„ 12	„	„ 1	„	20	1 mark	5	5	—	—	From her husband (unreported).
81	J. H.	M.	16	„ 12	„ 12	„ 12	„	„ 14	„	33	3 marks	—	—	—	—	In quarantine in same family as No. 70.
82	M. McK.	F.	16	„ 13	„ 7	„ 13	„	Sept. 22	„	10	3 „	5	5	—	4	Visited at G.'s (v. No. 75).
83	A. McK.	M.	18	„ 13	„ 9	„ 13	„	Oct. 10	„	28	3 „	—	—	—	—	„ „ „
84	J. G.	M.	60	„ 12	„ 8	„ 13	„	Sept. 25	„	13	2 „	9	9	—	—	Same house as G. (unreported).
85	E. E. McK.	F.	13	„ 13	„ 8	„ 13	Semi-confluent	Oct. 19	„	37	1 mark	—	—	—	—	V. 82, 83.
86	Mrs. L.	F.	57	„ 16	„ 8	„ 13	Discrete	Sept. 22	„	10	Doubtful	—	—	—	—	Same house as 80.
87	A. McK.	F.	20	„ 16	„ 10	„ 14	„	„ 22	„	9	3 marks	—	—	—	—	V. 82, 83, 85.
88	R. F.	M.	25	—	„ 9	„ 14	„	Oct. 11	„	28	1 mark	—	—	—	—	No particulars.
89	J. L.	M.	28	Sept. 18	„ 14	„ 18	„	„ 1	„	14	2 marks	—	—	—	—	Infirmary porter. No. 73 attended there as out-patient.
90	J. W. H.	M.	28	„ 22	„ 16	„ 19	„	„ 7	„	19	5 „	—	—	—	—	From No. 73. Model lodging-house.
91	A. I.	M.	50	„ 22	„ 18	„ 19	„	Nov. 4	„	47	3 „	—	—	—	—	„ „ „
92	J. M.	M.	37	„ 22	„ 18	„ 19	„	Oct. 9	„	21	1 mark	—	—	—	—	„ „ „

No.	Name.	Sex.	Age.	Notification.	Onset.	Removal to Hospital.	Type of Attack.	Date of Discharge.	Result.	Days in Hospital.	Vaccination.	Other Inmates of House. Number.	Vaccinated.	Unvaccinated.	Re-vaccinated.	Remarks as to Source of Infection, &c.
93	J. H. B.	M.	29	Sept. 20	Sept. 15	Sept. 19	Discrete	Oct. 4	Recovered	16	3 marks	3	3	—	—	Visited D.'s., No. 74.
94	T. D.	M.	37	" 20	" 15	" 20	"	" 4	"	13	1 mark	—	—	—	—	Husband of No. 74.
95	G. C. S.	M.	40	" 22	" 18	" 20	Confluent	Sept. 28	Died	9	Doubtful, no history.	—	—	—	—	From No. 73 (a drunkard).
96	E. A. S.	F.	7	" 21	—	" 21	Discrete	Oct. 6	Recovered	16	*Unvaccinated*	6	4	1	5	Not traced.
97	L. D.	F.	14	" 19	Sept. 18	" 21	Confluent	Sept. 28	Died	8	"	—	—	—	—	Child of Nos. 74 and 94.
98	W. J.	M.	22	" 23	" 19	" 22	"	Nov. 15	Recovered	55	2 marks	—	—	—	—	Same lodging-house as No 73.
99	J. G.	M.	36	—	" 18	" 22	Semi-confluent	Oct. 22	"	31	3 "	—	—	—	—	—
100	T. C.	M.	30	—	" 18	" 22	Discrete	" 10	"	19	4 "	6	6	—	5	Not traced.
101	J. W.	M.	43	—	" 18	" 22	"	" 4	"	13	3 "	—	—	—	—	—
102	J. G.	M.	26	Sept. 20	" 19	" 23	Confluent	Nov. 4	"	43	3 "	3	3	—	2	From W. E., No. 72.
103	B. T.	F.	33	—	" 17	" 23	Discrete	Oct. 11	"	19	1 mark	—	—	—	—	Sat next to J. S., No. 73, at infirmary.
104	B. A. W.	F.	54	Sept. 20	" 20	" 24	"	" 15	"	22	1 "	5	5	—	1	Visited by Mrs. R., on her leaving Small-pox Hospital, where she had been employed as extra nurse.
105	E. E.	F.	18	" 20	" 21	" 24	Semi-confluent	Nov. 8	"	46	4 marks	7	6	—	3	From her brother, W. E., No. 72.
106	T. E.	M.	14	" 20	" 21	" 24	Discrete	Oct. 16	"	23	4 "	—	—	—	—	" " "
107	M. C.	F.	23	" 20	" 21	" 24	Confluent	Feb. 11	"	141	*Unvaccinated*	3	3	—	—	Visited model lodging-house (Case No. 73, &c.).
108	F. C.	M.	32	" 20	" 22	" 25	Discrete	Oct. 19	"	25	3 marks	—	—	—	—	" " "
109	J. D.	M.	60	" 20	" 20	" 25	"	" 10	"	16	3 "	—	—	—	—	" " "
110	J. S.	M.	45	Oct. 12	" 30	Oct. 3	Semi-confluent	Nov. 16	"	44	3 "	—	—	—	—	" " "
111	F. H.	M.	23	—	Oct. 3	" 4	Discrete	Oct. 26	"	23	4 "	—	—	—	—	Same house as No. 86.
112	P. McD.	M.	38	—	Sept. 25	" 5	Confluent	Nov. 8	"	35	1 mark	—	—	—	—	—
113	J. S.	M.	23	—	Oct. 4	" 5	Discrete	Oct. 26	"	22	3 marks	45	—	—	—	From a lodging-house. Infected at hospital where he was admitted in error, Sept. 25.
114	F. L.	M.	13	Oct. 7	Sept. 30	" 5	"	Nov. 19	"	46	3 "	1	1	—	—	From No. 107.
115	P. L.	M.	40	" 7	Oct. 4	" 7	Confluent	" 9	"	34	*Unvaccinated*	—	—	—	—	"
116	J. B.	F.	29	" 10	" 7	" 10	Discrete	Oct. 19	Died	10	4 marks	5	2	2	4	From No. 112.
117	G. K.	M.	42	" 12	" 8	" 11	Confluent	" 21	"	11	5 "	—	—	—	—	At model lodging-house.
118	J. T.	M.	40	" 17	" 12	" 13	Semi-confluent	Nov. 12	Recovered	31	3 "	30	—	—	—	At work in hospital.
119	J. G.	M.	42	" 13	" 8	" 13	Discrete	Oct. 20	"	18	2 "	—	—	—	—	At model lodging-house.
120	E. N.	F.	48	" 21	" 19	" 21	Semi-confluent	Dec. 10	"	51	6 "	4	4	—	4	From No. 111.
121	O. B.	M.	54	" 23	" 18	" 22	Confluent	Oct. 22	Died	7	*Unvaccinated*	11	10	1	2	From inmates of model lodging-house.
122	M. W.	F.	5	—	—	" 23	Discrete	Nov. 11	Recovered	20	3 marks	—	—	—	—	—
123	C. K.	F.	23	Oct. 25	Oct. 22	" 25	"	" 12	"	19	3 "	2	2	—	1	From other cases in neighbourhood.

No.	Name.	Sex.	Age.	Notification.	Onset.	Removal to Hospital.	Type of Attack.	Date of Discharge.	Result.	Days in Hospital.	Vaccination.	Other Inmates of House.				Remarks as to Source of Infection, &c.
												Number.	Vaccinated.	Unvaccinated.	Re-vaccinated.	
124	J. C.	M.	29	Oct. 26	Oct. 23	Oct. 26	Confluent	Feb. 6	Recovered	104	*Unvaccinated*	6	5	1	5	From inmates of model lodging-house.
125	E. H.	F.	11	„ 27	„ 21	„ 23	Discrete	Nov. 12	„	16	3 marks	6	6	—	3	From his brother (unreported): mild attack.
126	A. H.	M.	40	„ 28	„ 21	„ 28	„	„ 11	„	15	3 „	34	—	—	—	At Worlingham Home. Visited by No. 92 just after his discharge from Small-pox Hospital.
127	A. K.	M.	40	„ 28	„ 23	„ 28	„	„ 14	„	18	1 mark	2	2	—	2	Also visited by No. 92 on same day as No. 126.
128	E. W.	M.	17	„ 28	„ 26	„ 28	Confluent	„ 9	Died	13	*Unvaccinated*	8	8	—	3	From other cases in neighbourhood.
129	F. C.	M.	32	„ 29	„ 22	„ 29	Discrete	„ 8	Recovered	11	3 marks	4	4	—	—	Not traced.
130	E. H.	F.	24	Nov. 2	„ 28	Nov. 2	Discrete	Nov. 15	„	14	5 „	2	2	—	—	Father employed in lime-washing infected houses.
131	M. G.	F.	38	„ 7	Nov. 2	„ 5	Semi-confluent	Dec. 15	„	41	2 „	8	7	1	1	Cases in neighbourhood.
132	M. H. B.	F.	1½	„ 11	„ 6	„ 8	Discrete	„ 10	„	33	4 „	10	10	—	—	Probably from Mrs. B. who nursed No. 121.
133	W. L.	M.	25	„ 11	„ 9	„ 11	Semi-confluent	„ 16	„	30	1 mark	8	8	—	—	Cases in neighbourhood.
134	L. A.	F.	27	„ 11	„ 9	„ 11	Discrete	Nov. 29	„	19	5 marks	9	9	—	—	From 132.
135	W. G.	M.	32	„ 16	„ 11	„ 16	„	„ 26	„	11	3 „	6	6	—	—	Customers from infected houses.
136	B. T.	F.	65	„ 23	„ 13	„ 23	„	Dec. 24	„	32	Doubtful	2	2	—	—	From 121.
137	J. M.	M.	25	„ 24	„ 14	„ 23	„	„ 13	„	21	4 marks	45	—	—	—	Inmate of a lodging-house; works at hospital.
138	E. W.	F.	30	„ 23	„ 16	„ 24	„	Jan. 6	„	44	3 „	4	3	1	1	From husband; mild attack; no medical attendance.
139	T. H. W.	M.	1½	„ 29	—	„ 29	Semi-confluent	„ 6	„	39	*Unvaccinated*	1	1	—	—	From 138.
140	E. T.	M.	33	Dec. 7	Dec. 4	Dec. 6	Discrete	„ 18	„	44	4 marks	—	—	—	—	From 136.
141	T. T.	M.	32	„ 7	„ 6	„ 8	„	„ 18	„	42	2 „	—	—	—	—	
142	M. H. L.	F.	35	„ 11	„ 4	„ 8	Semi-confluent	„ 25	„	49	1 mark	8	6	—	—	Her son played with children of 131.
143	S. H.	M.	33	„ 7	„ 4	„ 8	„	„ 23	„	47	3 marks	4	3	—	—	Travelling to Holmfield.
144	T. E.	M.	32	„ 9	„ 6	„ 9	„	„ 20	„	43	2 „	4	3	1	2	Not traced.
145	S. W.	F.	35	—	„ 10	„ 12	„	„ 30	„	50	3 „	2	2	—	—	At L. Grove, Lightcliffe, where in service.
146	F. M. H.	F.	7	Dec. 12	„ 8	„ 12	Confluent	Feb. 4	„	55	*Unvaccinated*	3	2	1	3	Other cases in neighbourhood.
147	S. H.	M.	20	„ 12	„ 10	„ 12	Discrete	Dec. 24	„	13	3 marks	7	6	1	3	From a lodger (unreported, and no medical attendance).
148	E. H.	M.	4	„ 12	—	„ 12	Confluent	Feb. 10	„	61	*Unvaccinated*	—	—	—	—	„ „ „
149	M. B.	M.	30	„ 12	Dec. 12	„ 12	„	„ 18	—	69	1 mark	—	—	—	—	„ „ „
150	F. H.	M.	¼	—	—	„ 12	Discrete	Dec. 29	Died	18	*Unvaccinated*	2	2	—	—	Relations of 147 to 149.
151	E. H.	F.	25	—	Dec. 10	„ 12	„	Jan. 22	Recovered	42	2 marks	—	—	—	—	„ „
152	W. R.	M.	21	Dec. 12	„ 6	„ 13	„	Dec. 24	„	12	3 „	3	3	—	—	From 147-149.
153	W. W.	M.	32	„ 14	„ 6	„ 14	Confluent	„ 18	Died	5	*Unvaccinated*	50	—	—	—	Inmate of lodging-house. Had been at Albion lodging-house, Batley.

No.	Name.	Sex.	Age.	Notification.	Onset.	Removal to Hospital.	Type of Attack.	Date of Discharge.	Result.	Days in Hospital.	Vaccination.	Other Inmates of House.				Remarks as to Source of Infection, &c.
												Number.	Vaccinated.	Unvaccinated.	Re-vaccinated.	
154	M. J.	M.	35	Dec. 14	Dec. 13	Dec. 14	Discrete	Dec. 27	Recovered	14	1 mark	—	—	—	—	Fellow lodger to 153.
155	J. F.	M.	20	„ 14	„ 8	„ 14	„	„ 27	„	14	3 marks	6	6	—	2	Working at Ossett; lodging in Dewsbury.
156	J. P.	M.	23	„ 14	„ 11	„ 14	„	Jan. 14	„	32	3 „	3	3	—	2	Visiting at Batley.
157	A. M.	F.	19	„ 16	„ 11	„ 16	„	„ 7	„	23	3 „	6	3	3	5	Same house as 135.
158	C. H.	M.	19	„ 17	„ 12	„ 17	„	„ 13	„	28	3 „	2	2	—	1	Not traced.
159	F. H.	M.	28	„ 19	„ 17	„ 19	„	„ 13	„	26	2 „	5	5	—	2	From unreported case (no medical advice).
160	G. H.	M.	23	„ 20	„ 15	„ 20	„	Dec. 30	„	11	3 „	4	4	—	—	Same family as 147, &c.
161	L. S.	F.	13	„ 20	„ 17	„ 20	„	Jan. 12	„	24	6 „	2	2	—	—	Not traced.
162	H. S.	F.	35	„ 21	„ 18	„ 21	„	„ 12	„	23	3 „	5	5	2	4	From same case as 159.
163	W. H.	M.	36	„ 22	„ 20	„ 22	Discrete	Jan. 21	„	31	2 marks	—	—	—	—	Same family as 146.
164	P. H.	F.	2	—	„ 19	„ 22	Confluent	Feb. 4	„	45	*Unvaccinated*	—	—	—	—	„ „
165	W. C. N.	M.	19	Dec. 24	„ 20	„ 23	Discrete	Jan. 13	„	22	4 marks	8	7	1	4	From L. Grove (v. 145).
166	E. N.	F.	3	„ 24	„ 21	„ 23	Confluent	„ 28	„	37	*Unvaccinated*	—	—	—	—	Same family as 165.
167	N. H. N.	F.	22	„ 24	„ 19	„ 23	Discrete	„ 28	„	37	3 marks	—	—	—	—	„ „
168	E. E.	M.	17	„ 24	„ 20	„ 23	„	„ 21	„	30	3 „	—	—	—	—	Also from Lightcliffe.
169	J. B.	M.	42	„ 24	„ 22	„ 24	Confluent	„ 4	Died	12	*Unvaccinated*	2	2	—	—	——
170	J. T.	M.	42	Jan. 1, 1893	„ 27	„ 29	Discrete	„ 28	Recovered	31	4 marks	30	—	—	—	Inmate of a common lodging-house. Came from Huddersfield.
171	S. A. C.	F.	36	„ 2	„ 31	Jan. 2	„	Feb. 18	„	48	2 „	—	—	—	—	Same house as 162.
172	J. R. M.	M.	34	„ 4	„ 30	„ 4	„	„ 4	„	32	1 mark	3	3	—	—	Not traced.
173	A. G.	F.	23	„ 6	Jan. 3	„ 6	Semi-confluent	Jan. 21	„	16	3 marks	—	—	—	—	——
174	J. C.	M.	20	„ 16	„ 5	„ 7	„	Feb. 25	„	50	3 „	—	—	—	—	Sent from Halifax Union.
175	S. B.	M.	22	„ 7	„ 6	„ 7	Discrete	Jan. 24	„	18	3 „	5	5	—	4	Not traced.
176	L. D.	M.	21	„ 3	„ 4	„ 8	„	„ 21	„	14	3 „	4	5	—	3	„
177	W. D.	M.	20	„ 16	„ 5	„ 9	„	„ 18	„	10	1 mark	—	—	—	—	Sent from Halifax Union. From 174.
178	C. E. S.	M.	19	„ 11	„ 5	„ 10	„	„ 20	„	9	3 marks	9	9	—	5	From 169.
179	S. H.	M.	9	„ 9	—	„ 10	„	Feb. 10	„	32	*Unvaccinated*	5	5	—	—	From other cases in neighbourhood.
180	E. T.	F.	25	„ 8	„ 6	„ 10	„	Jan. 26	„	15	3 marks	3	3	—	—	From D.'s, W. Street (not reported).
181	Mrs. S.	F.	32	„ 11	„ 7	„ 11	Confluent	Feb. 22	„	43	4 „	6	6	—	—	Visited at Bingley.
182	E. H.	F.	1½	„ 11	—	„ 11	„	Jan. 16	Died	6	*Unvaccinated*	2	2	—	—	Same house as No. 159.
183	W. S.	M.	37	„ 11	Jan. 9	„ 11	„	„ 17	„	7	3 marks	6	4	2	3	Not traced.
184	H. A. B.	F.	1	„ 11	„ 7	„ 12	„	„ 18	„	7	*Unvaccinated*	5	4	—	—	From 179 (house in same street).

No.	Name.	Sex.	Age.	Notification.	Onset.	Removal to Hospital.	Type of Attack.	Date of Discharge.	Result.	Days in Hospital.	Vaccination.	Other Inmates of House.				Remarks as to Source of Infection, &c.
												Number.	Vaccinated.	Unvaccinated.	Re-vaccinated.	
185	Mrs. B.	F.	18	Jan. 13	Jan. 10	Jan. 13	Discrete	Jan. 24	Recovered	12	3 marks	5	5	—	—	From D.'s, W. Street (v. No. 180).
186	G. T.	M.	26	„ 13	„ 8	„ 18	„	Feb. 8	„	27	3 „	3	2	—	3	From brother-in-law (mild attack; no medical attendance).
187	J. H.	M.	24	„ 13	„ 8	„ 13	„	Jan. 28	„	16	2 „	2	1	1	1	Not traced.
188	F. S.	M.	46	„ 15	„ 10	„ 14	Confluent	Still in	—	—	2 „	7	7	—	—	Other cases in neighbourhood.
189	J. A.	M.	41	„ 15	„ 13	„ 14	Discrete	„	—	—	2 „	50	—	—	—	Same lodging-house as No. 170.
190	S. B.	F.	24	„ 16	„ 11	„ 14		Feb. 11	Recovered	29	2 „	6	7	—	5	From Miss D., W. Street (not attended; v. Nos. 180 and 185).
191	E. C.	F.	22	„ 13	„ 9	„ 14	Confluent	„ 11	„	29	4 „	1	1	—	—	Not traced.
192	W. H.	M.	30	„ 16	„ 12	„ 15	Discrete	Jan. 28	„	14	3 „	6	6	—	4	„
193	C. H.	M.	31	„ 15	„ 12	„ 15	„	Feb. 4	„	21	3 „	6	4	2	2	„
194	H. C.	M.	26	„ 13	„ 7	„ 13	„	„ 17	„	36	2 marks; re-vaccinated.	5	4	2	3	Delivered letters at hospital.
195	E. C.	F.	40	„ 19	„ 6	„ 10	„	Mar. 4	„	44	1 mark	4	4	—	4	Not traced.
196	E. B.	F.	23	„ 19	„ 15	„ 17	„	Jan. 24	„	18	6 marks	6	7	—	5	Same house as 190.
197	F. W.	M.	27	„ 18	„ 14	„ 18	„	Still in	—	—	2 „	70	—	—	—	From Old Model lodging-house. (Sent from Union.)
198	A. B.	F.	18	„ 16	—	„ 17	„	Feb. 11	Recovered	26	—	33	—	—	—	From Rotherham. Came from a hotel in Halifax.
199	G. D.	M.	31	„ 20	„ 17	„ 20	„	„ 17	„	29	5 marks	9	9	—	9	Not traced.
200	G. B.	M.	32	„ 21	„ 15	„ 21	„	„ 6	„	18	3 „	—	—	—	—	Sent from workhouse. Had tramped from Ripponden to Doncaster.
201	E. B.	F.	34	„ 23	„ 18	„ 21	„	Mar. 4	„	43	3 „	—	—	—	—	
202	N. H.	F.	3	„ 22	„ 19	„ 22	Confluent	Jan. 27	Died	6	*Unvaccinated*	9	9	—	7	From unreported case. (No medical man.)
203	D. B.	M.	55	„ 25	„ 17	„ 25	Discrete	Feb. 25	Recovered	34	3 marks	—	—	—	—	Sent from workhouse. From 174.
204	M. B.	M.	33	„ 23	„ 21	„ 23	Confluent	Jan. 31	Died	9	2 „	3	3	—	—	Same house as 184.
205	T. D.	M.	35	„ 23	„ 19	„ 23	Discrete	Feb. 8	—	17	3 „	60	—	—	—	Working at Battyeford. Came from Barrack Terrace.
206	A. P.	M.	23	„ 25	„ 20	„ 23	„	„ 25	—	34	4 „	—	—	—	—	Sent from workhouse. 174.
207	L. L.	F.	22	„ 23	„ 21	„ 24	„	„ 1	—	9	2 „	—	—	—	—	Brother travelling at Brighouse.
208	E. S.	F.	6	„ 26	„ 22	„ 24	„	„ 10	Recovered	18	3 „	5	2	1	3	Same family as 183.
209	M. S.	M.	12	„ 26	„ 20	„ 24	Semi-confluent	Still in	—	—	*Unvaccinated*	—	—	—	—	„
210	G. O.	M.	68	—	„ 19	„ 24	Discrete	Feb. 17	Recovered	25	1 mark	—	—	—	—	From workhouse. 174.
211	L. P.	F.	9	„ 26	„ 20	„ 26	Semi-confluent	Mar. 8	„	42	*Unvaccinated*	5	4	1	4	From brother (unreported; no medical advice).
212	C. B.	M.	50	„ 25	„ 22	„ 25	Discrete	Feb. 25	„	32	4 marks	—	—	—	—	Workhouse. 174.
213	S. B.	M.	4	„ 30	„ 26	„ 26	Semi-confluent	Still in	—	—	*Unvaccinated*	—	—	—	—	Same family as 184.
214	J. Y.	M.	27	„ 29	„ 25	„ 29		„	—	—	2 marks	3	3	—	—	From cases in neighbourhood.
215	A. D.	F.	24	—	„ 26	„ 28	„	Feb. 23	Recovered	27	3 „	—	—	—	—	Workhouse. Wife of 177.

No.	Name.	Sex.	Age.	Notification.	Onset.	Removal to Hospital.	Type of Attack.	Date of Discharge.	Result.	Days in Hospital.	Vaccination.	Other Inmates of House.				Remarks as to Source of Infection, &c.
												Number.	Vaccinated.	Unvaccinated.	Re-vaccinated.	
216	H. C.	M.	32	Jan. 28	Jan. 25	Jan. 30	Discrete	Feb. 20	Recovered	22	1 mark	3	3	—	—	Same house as 195.
217	M. S. B.	F.	21	„ 31	„ 29	„ 31	„	Mar. 4	—	33	2 marks	4	3	1	4	——
218	J. S.	M.	44	Feb. 1	„ 28	Feb. 1	„	Feb. 17	—	17	2 „	—	—	—	—	Same house as 188.
219	H. C.	F.	53	„ 1	„ 28	„ 1	„	„ 23	—	33	3 „	—	—	—	—	Had visited Cuddyfield.
220	E. A.	F.	29	„ 1	„ 29	„ 1	„	„ 25	—	25	2 „	—	—	—	—	Not traced.
221	M. A.	F.	3	„ 1	„ 28	„ 1	Confluent	„ 6	Died	6	*Unvaccinated*	—	—	—	—	„
222	F. N.	M.	30	„ 2	„ 27	„ 1	Semi-confluent	Still in	—	—	3 marks	—	—	—	—	Had visited Keighley.
223	— B.	F.	⅞	„ 6	Feb. 8	„ 6	„	Mar. 4	Recovered	32	*Unvaccinated*	—	—	—	—	From father (unreported ca
224	L. C.	F.	17	„ 7	Jan. 31	„ 7	Discrete	Feb. 18	„	12	3 marks	—	—	—	—	——
225	W. B.	M.	27	„ 9	Feb. 4	„ 9	„	„ 18	„	10	6 „	—	—	—	—	——
226	J. P.	M.	25	„ 9	„ 4	„ 9	„	Still in	—	—	2 „	—	—	—	—	——
227	E. C.	F.	9	—	„ 8	„ 13	Semi-confluent	Mar. 29	Recovered	45	Unvaccinated	—	—	—	—	Not traced.
228	— B.	F.	5 weeks	—	„ 13	Jan. 31	Discrete	„ 4	„	20	„	—	—	—	—	Admitted to mother, No. 217.
229	S. A. W.	F.	29	—	„ 7	„ 14	„	Feb. 25	„	12	3 marks	—	—	—	—	From husband; mild attack; no medical attendance.
230	T. W.	M.	18	—	„ 13	„ 15	„	Mar. 4	„	18	3 „	—	—	—	—	From case }
231	J. T.	M.	17	—	„ 11	„ 15	„	„ 4	„	18	4 „	—	—	—	—	„ } Militia men removed from Halifax Barracks.
232	J. A. T.	M.	18	—	„ 9	„ 15	„	„ 11	„	25	5 „	—	—	—	—	„ }
233	W. B.	M.	19	—	„ 10	„ 15	Confluent	Apr. 15	„	60	6 „	—	—	—	—	No trace }
234	T. H.	M.	21	—	„ 10	„ 15	Discrete	Mar. 4	„	18	3	—	—	—	—	From case }
235	H. S.	F.	21	—	„ 11	„ 17	„	Feb. 25	„	9	4 „	—	—	—	—	From case 218.
236	J. P.	M.	19	—	„ 12	„ 17	„	„ 25	„	9	3 „	—	—	—	—	„
237	E. S.	F.	15	—	„ 16	„ 19	„	Mar. 25	„	35	3 „	—	—	—	—	Infected (?) at Holdsworth Mill.
238	T. P. N.	M.	4	—	„ 16	„ 20	Semi-confluent	„ 29	„	37	Unvaccinated	—	—	—	—	Not traced.
239	L. W.	F.	9	—	„ 16	„ 20	Confluent	„ 4	Died	13	„	—	—	—	—	„
240	G. W.	M.	43	—	„ 15	„ 21	Discrete	„ 8	Recovered	16	4 marks	—	—	—	—	From case 235.
241	M. C.	F.	9	—	„ 18	„ 22	„	„ 15	„	32	Unvaccinated	—	—	—	—	From case 224 (sister).
242	J. W. S.	M.	28	—	„ 19	„ 22	„	„ 18	„	25	4 marks	—	—	—	—	Other cases in neighbourhood.
243	J. W. H.	M.	21	—	„ 16	„ 22	„	„ 18	„	25	3 „	—	—	—	—	Not traced.
244	E. W.	F.	39	—	„ 20	„ 23	Semi-confluent	—	Still in	—	3 „	—	—	—	—	From case 235.
245	S. D.	M.	35	—	„ 21	„ 23	„	„ 29	„	35	3 „	—	—	—	—	Not traced.
246	S. G.	F.	21	—	„ 17	„ 24	Discrete	„ 15	„	20	3 „	—	—	—	—	From case 247.

No.	Name.	Sex.	Age.	Notification.	Onset.	Removal to Hospital.	Type of Attack.	Date of Discharge.	Result.	Days in Hospital.	Vaccination.	Other Inmates of House.				Remarks as to Source of Infection, &c.
												Number.	Vaccinated.	Unvaccinated.	Re-vaccinated.	
247	J. P.	M.	43	—	Feb. 17	Jan. 24	Discrete	Mar. 15	Still in	20	4 marks	—	—	—	—	Supposed whilst working at Procter's cotton mill.
248	A. S.	F.	22	—	„ 19	„ 24	„	„ 15	„	20	1 mark	—	—	—	—	Not traced.
249	J. B.	M.	46	—	„ 23	„ 25	„	„ 25	„	23	3 marks	—	—	—	—	Sat next to No. 226 at "club" night, before 226 came to hospital.
250	F. H.	M.	24	—	„ 25	„ 27	Semi-confluent	Apr. 15	„	48	3 „	—	—	—	—	From No. 233.
251	M. H.	F.	28	—	„ 25	„ 27	Discrete	Mar. 15	„	17	3 „	—	—	—	—	From a lodger who had been cleaning an infected house at Hebden Bridge.
252	P. C.	M.	16	—	„ 24	„ 27	„	„ 18	„	20	4 „	—	—	—	—	—
253	E. H.	M.	24	—	„ 28	Mar. 3	Semi-confluent	Apr. 8	„	37	3 „	—	—	—	—	At Siddal?
254	E. B.	F.	17	—	Mar. 2	„ 6	„	„ 1	„	27	4 „	—	—	—	—	—
255	A. W.	F.	37	—	„ 3	„ 9	Discrete	„ 1	„	24	3 „	—	—	—	—	—
256	T. B.	M.	30	—	„ 4	„ 8	Confluent	Mar. 24	Died	17	Unvaccinated	—	—	—	—	—
257	J. H. H.	M.	59	—	„ 8	„ 8	Discrete	—	Still in	—	3 marks	—	—	—	—	—
258	A. L.	M.	48	—	„ 3	„ 9	„	Mar. 30	Recovered	22	3 „	—	—	—	—	—
259	W. C.	M.	14	—	„ 1	„ 10	Discrete	Mar. 29	„	20	3 „	—	—	—	—	—
260	W. H.	M.	20	—	„ 8	„ 11	„	„ 25	„	15	2 „	—	—	—	—	—
261	R. N.	F.	45	—	„ 10	„ 14	Confluent	„ 22	Died	9	2 „	—	—	—	—	—
262	W. J.	M.	9 months	—	„ 22	„ 23	„	„ 31	„	9	Unvaccinated	—	—	—	—	—
263	F. C.	M.	37	—	„ 22	„ 24	Discrete	—	Still in	—	2 marks	—	—	—	—	—
264	A. B.	F.	26	—	„ 23	„ 25	Confluent	Apr. 7	Died	14	Unvaccinated	—	—	—	—	—
265	G. M.	M.	26	—	„ 25	„ 27	Discrete	—	Still in	—	2 marks	—	—	—	—	—
266	E. M. M.	F.	6 months	—	„ —	„ 27	Confluent	Mar. 30	Died		Unvaccinated	—	—	—	—	Child of No. 265.
267	M. J. M.	F.	13	—	„ 31	Apr. 2	Discrete	—	Still in	—	3 marks	—	—	—	—	—
268	H. M.	M.	18	—	„ 29	„ 2	„	—	„	—	3 „	—	—	—	—	—
269	E. A. O.	F.	8	—	„ 29	„ 2	„	—	„	—	3 „	—	—	—	—	—
270	M. C.	F.	6	—	„ 30	„ 2	Confluent	—	„	—	Unvaccinated	—	—	—	—	—
271	F. S.	M.	25	—	„ 29	„ 2	Discrete	—	„	—	3 marks	—	—	—	—	—
272	M. A. W.	F.	37	—	„ 29	„ 3	„	—	„	—	2 „	—	—	—	—	—
273	W. M.	M.	35	—	„ 28	„ 3	„	—	„	—	3 „	—	—	—	—	—
274	M. C.	M.	12	—	Apr. 2	„ 3	„	—	„	—	3 „	—	—	—	—	—
275	E. K.	F.	37	—	Mar. 31	„ 3	„	—	„	—	2 „	—	—	—	—	—
276	A. H.	M.	24	—	Apr.	„ 3	„	—	„	—	2 „	—	—	—	—	—
277	L. B. C.	F.	1	—	„ 2	„ 4	„	—	„	—	Unvaccinated	—	—	—	—	—
278	L. C.	M.	4	—	„ 2	„ 4	Semi-confluent	—	„	—	„	—	—	—	—	—

No.	Name.	Sex.	Age.	Notification.	Onset.	Removal to Hospital.	Type of Attack.	Date of Discharge.	Result.	Days in Hospital.	Vaccination.	Other Inmates of House.				Remarks as to Source of Infection, &c.
												Number.	Vaccinated.	Unvaccinated.	Re-vaccinated.	
279	A. C.	F.	27	—	Apr. 2	Apr. 4	Discrete	—	Still in	—	3 marks	—	—	—	—	—
280	Mrs. L.	F.	30	—	„ 2	„ 4	Semi-confluent	—	„	—	3 „	—	—	—	—	—
281	A. O.	F.	27	—	„ 1	„ 4	„	—	„	—	2 „	—	—	—	—	—
282	G. S.	M.	46	—	„ 3	„ 4	„	—	„	—	3 „	—	—	—	—	—
283	L. W.	F.	37	—	Mar. 31	„ 4	Discrete	—	„	—	2 „	—	—	—	—	—
284	T. H.	M.	33	—	„ 31	„ 4	Semi-confluent	—	„	—	2 „	—	—	—	—	—
285	J. C.	M.	28	—	Apr. 2	„ 4	Confluent	Apr. 12	Died	9	Unvaccinated	—	—	—	—	—
286	H. N.	M.	25	—	„ 1	„ 4	Discrete	—	„	—	2 marks	—	—	—	—	—
287	H. S.	M.	24	—	„ 1	„ 5	„	—	„	—	2 „	—	—	—	—	—
288	A. P.	F.	24	—	„ 3	„ 5	„	—	„	—	3 „	—	—	—	—	—
289	J. B.	M.	45	—	„ 2	„ 5	Semi-confluent	—	„	—	1 mark	—	—	—	—	—
290	J. H.	M.	19	—	„ 1	„ 5	Discrete	—	„	—	2 marks	—	—	—	—	—
291	W. H. B.	M.	19	—	„ 3	„ 5	Confluent	Apr. 10	Died	6	1 mark	—	—	—	—	—
292	J. W. F.	M.	43	—	„ 4	„ 5	„	—	Still in	—	3 marks	—	—	—	—	—
293	H. P.	M.	43	—	„ 1	„ 5	„	Apr. 10	Died	6	2 „	—	—	—	—	—
294	G. H.	M.	38	—	Mar. 30	„ 5	Discrete	—	Still in	—	2 „	—	—	—	—	—
295	E. F.	F.	19	—	Apr. 2	„ 5	„	—	„	—	4 „	—	—	—	—	—
296	A. N.	F.	47	—	„ 3	„ 5	Semi-confluent	—	„	—	5 „	—	—	—	—	—
297	D. C.	M.	51	—	Mar. 31	„ 5	Discrete	—	„	—	3 „	—	—	—	—	—
298	S. W.	M.	51	—	Apr. 3	„ 5	„	—	„	—	2 „	—	—	—	—	—
299	J. P.	M.	40	—	„ 2	„ 5	„	—	„	—	2 „	—	—	—	—	—
300	R. F.	M.	4	—	—	„ 6	Confluent	Apr. 15	Died	10	*Unvaccinated*	—	—	—	—	—
301	G. B.	M.	34	—	Apr. 6	„ 6	Discrete	—	„	—	3 marks	—	—	—	—	—
302	F. G.	M.	32	—	„ 3	„ 6	Semi-confluent	—	„	—	6 „	—	—	—	—	—
303	L. C.	F.	30	—	„ 5	„ 6	Discrete	—	„	—	2 „	—	—	—	—	—
304	A. B.	F.	30	—	„ 3	„ 6	„	—	„	—	2 „	—	—	—	—	—
305	M. K.	F.	27	—	„ 4	„ 6	„	—	„	—	3 „	—	—	—	—	—
306	W. M.	M.	23	—	„ 3	„ 6	„	—	„	—	5	—	—	—	—	—
307	H. V.	M.	14	—	„ 1	„ 6	„	—	„	—	1 mark	—	—	—	—	—
308	R. W. S.	M.	24	—	„ 1	„ 6	„	—	„	—	2 marks	—	—	—	—	—
309	W. H. N.	M.	28	—	„ 2	„ 6	„	—	„	—	3 „	—	—	—	—	—
310	S. G.	F.	26	—	„ 2	„ 6	„	—	„	—	1 mark	—	—	—	—	—

HALIFAX.

HALIFAX.

No.	Name.	Sex.	Age.	Notification.	Onset.	Removal to Hospital.	Type of Attack.	Date of Discharge.	Result.	Days in Hospital.	Vaccination.	Other Inmates of House.				Remarks as to Source of Infection, &c.
												Number.	Vaccinated.	Unvaccinated.	Re-vaccinated.	
311	P. B.	M.	2	—	—	Apr. 6	Semi-confluent	—	Died	—	?	—	—	—	—	—
312	E. L.	F.	19	—	Apr. 3	„ 7	„	—	„	—	2 marks	—	—	—	—	—
313	K. S.	F.	54	—	„ 4	„ 7	Confluent	Apr. 13	„	7	„ „	—	—	—	—	—
314	C. J.	F.	30	—	„ 4	„ 7	Discrete	—	Still in	—	„ „	—	—	—	—	—
315	L. K.	F.	36	—	„ 2	„ 7	„	—	„	—	„ „	—	—	—	—	—
316	S. F.	F.	14	—	„ 3	„ 7	„	—	„	—	„ „	—	—	—	—	—
317	J. F.	M.	30	—	„ 3	„ 7	„	—	„	—	„ „	—	—	—	—	—
318	H. C. L.	M.	21	—	Mar. 31	„ 7	„	—	„	—	3 „	—	—	—	—	—
319	A. S.	M.	40	—	Apr. 6	„ 7	„	—	„	—	6 „	—	—	—	—	—
320	W. P.	M.	10	—	„ 1	„ 7	Confluent	Apr. 14	Died	8	*Unvaccinated*	—	—	—	—	—
321	A. P.	F.	40	—	„ 4	„ 7	Discrete	—	Still in	—	2 marks	—	—	—	—	—
322	I. N.	M.	40	—	„ 3	„ 7	„	—	„	—	1 mark	—	—	—	—	—
323	E. S.	F.	47	—	„ 5	„ 7	„	—	„	—	2 marks	—	—	—	—	—
324	J. F. D.	M	21	—	„ 4	„ 8	„	—	„	—	*Unvaccinated*	—	—	—	—	—
325	C. D.	F	36	—	„ 4	„ 8	„	—	„	—	2 marks	—	—	—	—	—
326	I. H.	M.	40	—	„ 5	„ 8	Semi-confluent	—	„	—	„ „	—	—	—	—	—
327	J. W. H.	M.	22	—	„ 8	„ 10	Discrete	—	„	—	„ „	—	—	—	—	—
328	A. K.	M.	36	—	„ 9	„ 10	„	—	„	—	3 „	—	—	—	—	—
329	M. J. B.	F.	49	—	„ 7	„ 10	„	—	„	—	6 „	—	—	—	—	—
330	J. H.	M.	34	—	„ 8	„ 11	Semi-confluent	—	„	—	2 „	—	—	—	—	—

APPENDIX VI.

HALIFAX UNION.

VACCINATION RETURNS, 1872–1892.

Year.	Births registered during Year.	Of the children whose Births were registered during the Year given in the First Column, by the 31st January in the Year next but one following that Year there were:—						
		Successfully Vaccinated.	Certified as insusceptible of Vaccination.	Had Small-Pox.	Died Un-vaccinated.	Vaccination Postponed by Medical Certificate.	Remaining.	The Children not finally accounted for (including Cases postponed) being per cent. of Births.
1872	5,682	5,022	6	1	553	100		1·8
1873	5,552	5,030	2	1	459	12	48	1·1
1874	5,777	5,141	2	0	592	9	33	0·7
1875	5,756	5,081	0	0	578	24	73	1·7
1876	5,902	5,195	2	1	554	55	95	2·5
1877	5,861	5,074	1	0	547	82	157	4·1
1878	5,824	5,027	1	1	558	66	171	4·1
1879	5,426	4,696	1	0	451	86	182	4·9
1880	5,517	4,710	5	0	584	53	165	4·0
1881	5,337	4,574	3	0	503	82	175	4·8
1882	5,200	4,396	3	0	559	70	172	4·7
1883	5,035	4,177	7	0	464	102	285	7·7
1884	5,173	3,946	6	0	620	123	478	11·6
1885	5,068	4,083	7	0	480	112	386	9·8
1886	4,973	3,797	9	0	524	112	531	13·0
1887	5,061	3,030	13	0	593	125	1,300	28·2
1888	5,040	2,167	9	0	607	82	2,175	44·8
1889	4,896	1,284	7	0	667	64	2,874	60·0
1890	4,900	737	4	0	747	42	3,370	69·6
1891	4,868	545	1	0	675	11	3,636	74·9
1892								

IX.—Report on the Prevalence of Small-Pox at Bradford, 1893.

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§ 1. *Bradford—Area : Population.*

Population.

The county borough of Bradford has an area of 10,776 acres, and a population (census 1891) of 216,361, an increase of 21,866, or 11·2 per cent. on the population of 1881.

For municipal and statistical purposes the borough is divided into fifteen wards (North, South, East, West, Listerhills, Great Horton, Little Horton, East Bowling, West Bowling, Exchange, Bradford Moor, Manningham, Bolton, Heaton, and Allerton), the population density varying from 85·8 persons per acre in West Ward to 3·2 persons per acre in Allerton Ward.

Birth- and death-rates.

The average annual birth-rate for the 10 years, 1882–1891, is 30·03 ; the average rate for the first half of this period being 30·68, and that for the second half, 29·38. The average annual death-rate for the ten years, 1882–1891 is 20·64 ; that for the first, being 19·97, and for the second half, 21·31. The zymotic death-rate for the whole period has been 2·3; for the first half 2·2, for the second 2·4. Thus with a slightly diminishing birth-rate there has been an increasing death rate, and slight increase in the death rate from zymotic disease (*see* Appendix I.).

Sanitary department.

The sanitary organisation of the borough is directed by the Town Council, of which there is a Sanitary Committee. The Medical Officer of Health is W. Arnold Evans, Esq., M.D., and the Sanitary Department consists of (*a*) a public analyst, (*b*) chief inspector of nuisances, (*c*) meat inspector, (*d*) food and drugs inspector, (*e*) 7 sub-inspectors of nuisances, (*f*) 2 disinfecting officers, (*g*) workshop inspector, (*h*) manager of destructor works, (*i*) three clerks. There are also a chief building inspector with two assistant inspectors.

The Fever Hospital, which was taken over by the Corporation in 1887, is under the control of a committee of the Town Council. The medical superintendent is Mr. A. E. Foster, M.R.C.S., and the matron, Miss Mellor.

Method of dealing with infectious diseases.

The seven "sub-inspectors" of nuisances are each assigned a sanitary district, of an area proportionate to the density of its population. These inspectors are employed on epidemic work, so that during times of epidemic they may have to forego their ordinary nuisance inspection. Their instructions require them to visit infected houses for a fortnight following the appearance of small-pox in them ; and should any suspicious case arise to communicate forthwith with the Medical Officer of Health.

Notification of infectious diseases has been in vogue in the borough since 1881, and at the beginning of 1891 the Infectious Diseases (Notification) Act was adopted.

Medical practitioners are furnished with forms (Appendix II.) of certificates of notification, and if they state the desirability of removal of the case, the ambulance is at once sent to convey it to hospital. If, in the opinion of the medical attendant, it is not desirable to remove the patient, the medical officer of health visits the house to satisfy himself as to the isolation of the case.

On receipt of the notifications they are entered in a register kept for the purpose, and also in the "Inspectors' Book," where are subsequently filled in the details noted by the inspector on visiting the premises. This book has the following headings :—

Inspection of Premises where Infectious Disease has occurred.

Name and Address.	Nature of Disease.	Condition of Premises and Report of Officer thereon.	By whom visited.	Date of Notice.	Date when each due.

The inquiries by the inspectors include particulars as to school attendance (Sunday and day-school), milk supply and place of work. These particulars are entered on separate forms (Appendix III.) and handed to the clerk, who issues notices to the places concerned.

As regards schools, the cases arising among children in attendance are reported to the school attendance officer, who fills in the form for the information of the school authorities.

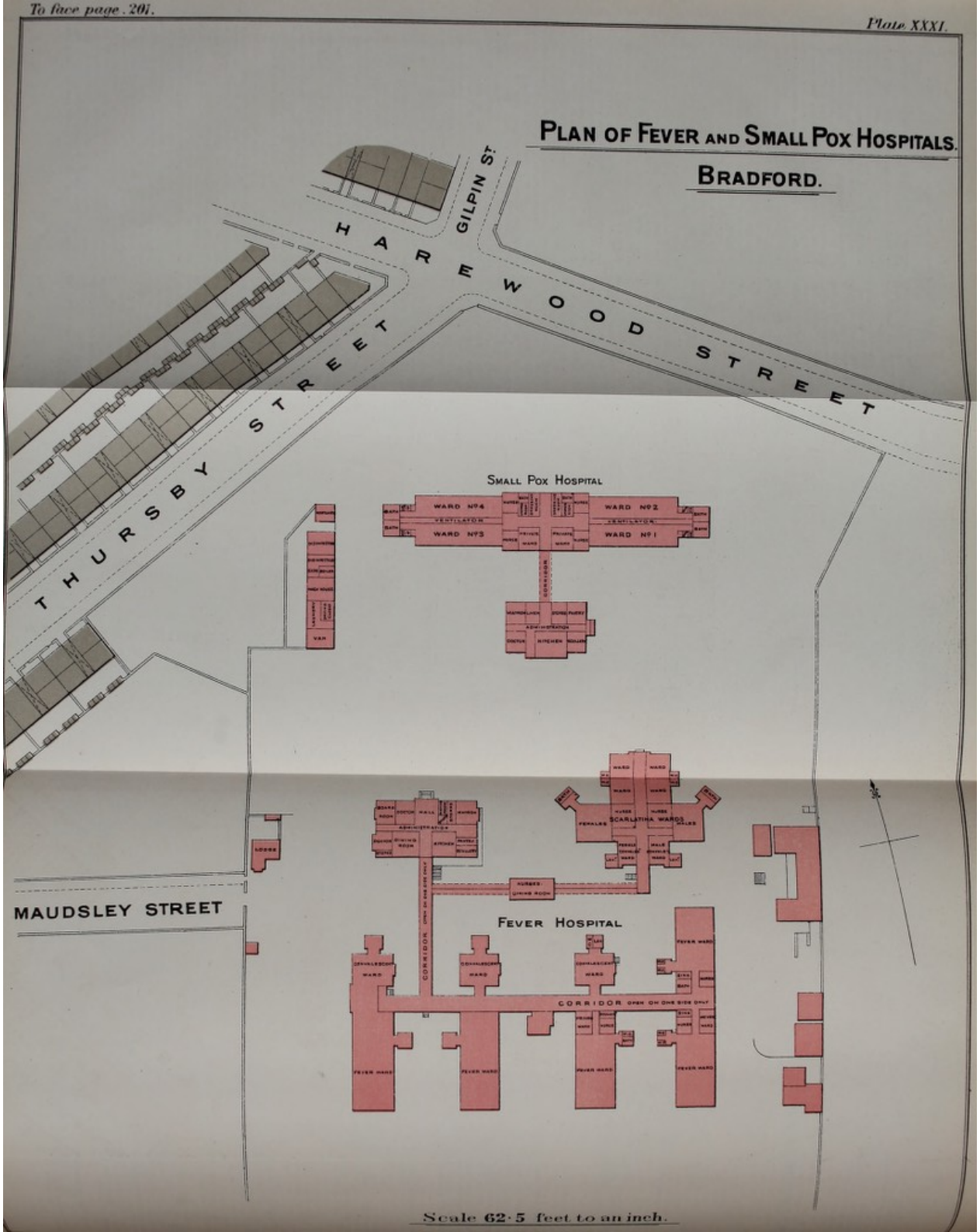
In the case of small-pox, notices are also sent to the places where people coming from infected houses are at work. In that way, cases have been discovered ; or, the origin of previously untraced cases has been found out.

The employers do not allow their hands to continue at work, so long as the house is infected ; but at the lapse of a full fortnight the medical officer of health notifies that the house has been disinfected, and the inmates free from quarantine (*see* Appendix IV.). Similar notification is also sent to the schools.

A list of books found in infected houses and belonging to the Free Library is furnished daily to the chief librarian, who is also notified of all infected house-

PLAN OF FEVER AND SMALL POX HOSPITALS.

BRADFORD.



Scale 62·5 feet to an inch.

holds. The books are confiscated and sent to the Fever Hospital for the use of the patients; and the Sanitary Committee annually writes off a sum to the Free Library Committee to purchase new books in their place.

Registers are kept of infectious diseases in schools, and of the milk supply, in relation to infectious diseases.

There are two ambulances at present in use, one being limited to small-pox, the other to scarlet fever.

Immediately on removal of the case, the disinfecting officer proceeds to the house with the van to collect clothing, bedding, &c. for removal to the disinfecting station. After their disinfection they are returned by another van. Meanwhile the house has been fumigated (with sulphur) and, if necessary, the walls stripped and limewashed.

A system of quarantining families away from their homes has been adopted on a small scale in a house in Valley Road. This can only accommodate five persons, but since June 20, 1892, about 100 persons have been quarantined there for a fortnight; and, of those four developed small-pox whilst in quarantine. For compensation the corporation paid such families their house rent, and about one half their weekly wage-earnings.

The procedure with regard to small-pox in the common lodging-houses has been as follows:—The medical officer visited the lodging-house with the inspector and took down the names of the inmates, who were told that they must consider themselves in quarantine for a fortnight. During this period the house was kept under surveillance by three or four inspectors in turn, from 6 a.m. to midnight. If within the fortnight any fresh case occurred the surveillance was extended. The inmates had free lodging during the quarantine period, at the expense of the Corporation. In all, there had been four such lodging-houses in quarantine (averaging 25 to 30 inmates each); but only two cases of small-pox had arisen in them after the first case was removed.

Only one case of small-pox was known to have occurred among the inmates of the Salvation Army Shelter; but it is difficult to get information from the officials of this shelter (an old mill), which, however, is from time to time disinfected.

The Bradford Fever Hospital was opened in 1872. It is situated on high ground to the east of Bradford, and at the time of its erection was near the outskirts of the borough. A full description of the hospital is given in the Report on the Use and Influence of Hospitals for Infectious Disease made by Dr. Thorne Thorne to the Local Government, and issued as a supplement to the 10th annual report of that Board. At that time "the situation of the hospital" was "an isolated one, their being hardly any "dwellings in its vicinity, and of these the nearest stands "some 250 feet from any of the hospital buildings" (*loc. cit.*, p. 84). Since then, however, and especially within the past few years, rows of houses have been built close to the walls of the hospital grounds. The buildings originally consisted of an administrative block with a corridor running east and west, opening into which were three larger pavilions on the south and three smaller ones on the north (and on a higher level than the south ones.) In 1887 a fourth pavilion was added at the eastern end of the corridor; this is more lofty and better constructed than the other. There is, in addition, a large quadrangular or rather cruciform pavilion containing several wards, which stands to the north of the others, and has a separate connexion with the administrative block by a covered way. There is now accommodation in the whole building for 196 patients (Plate XXXII.).

The usual staff consists of the medical superintendent, matron, 16 to 19 nurses, six wardmaids.*

At the time of the introduction of small-pox cases, all the staff were re-vaccinated except those who had had small-pox or been recently re-vaccinated. None of them contracted the disease.

It was originally contemplated to build a separate block for the accommodation of small-pox cases, but this was not carried into effect until 1892, when the present building, standing to the north of the fever hospital (*see* Plan), was erected. Meanwhile, small-pox was always treated in the hospital whenever it occurred, and Dr. Thorne Thorne says that the isolation thus afforded had on many occasions since 1874 effectually prevented the spread of small-pox in the borough. The construction of these small-pox wards, 2 in number, accommodating about 20 patients, was based on the novel principle of hermetically sealing all the windows, and ventilating by means of warmed air, the extraction shaft conducting the foul air over a furnace. In his report for 1891 Dr. Evans cites the following description of the new building, which appeared in the *Bradford Observer* of December 5th, 1891:— BRADFORD.

"The hospital is arranged with two wards, each 72 ft. by 15 ft., which are placed side by side, having a space of 3 ft. between them. Bath rooms, w.c.'s, slop sinks, and linen shoots are arranged at the end of each ward, and nurses' rooms adjoin the wards at the entrance ends, with supervision windows to each ward. A private ward is also provided. A special feature of the arrangements, is an undressing room for convalescents, where they leave behind hospital clothing, and then pass into a bath room, and thence into a dressing-room, where their own clothes are put on and from this room they pass direct into the outer air—thus doing away with all risk of carrying infection away with them. An administrative department, communicating with the ward block by a covered corridor of glass, is provided, and contains kitchen, scullery, pantry, linen store, doctors' room, and matron's room on the ground floor, and several bed-rooms for nurses, &c., on the upper floor, and the needful w.c. and bath accommodation. The wash-house block comprises a wash-house, laundry, drying closets, and a steam disinfecting apparatus by Messrs. Goddard, Massey and Warner, of Nottingham. The drying closet, steam boiler, and wash-house and laundry fittings, have been supplied by Bradford and Co., of Manchester. The drainage is divided into two separate and distinct systems. The one for roof and surface water goes direct into the mains, but all the foul drains empty into disinfecting tanks, which are duplicated, so that whilst one tank is being emptied after disinfection, the other is receiving the drainage, and going through the process of disinfection by an admixture of chemicals.

"There are special arrangements for the destruction of the germs of disease. All the windows are made tight, and the fresh air is let in by three shafts from the outside, carried under floors and into the lowest compartment of the 3 ft. space between the two wards. Above this compartment, and divided from it by flags with open joints, in another compartment are placed the heating pipes, which are very powerful, and from this compartment flues are carried into the wards which conduct the fresh air (warmed in cold weather by contact with the heating pipes last named), into the same through gratings in the floors, one being placed at the foot of each bed. Above the compartment last named is an extracting flue made perfectly air-tight, and into this flue openings are made at the ceiling level of the wards over each bed. A powerful furnace, with honeycomb firebrick divisions, is placed in the cellar at the end of this flue, and this furnace draws the foul air out of the wards, and it passes through the furnace and out into the open air by a large chimney. Thus all vitiated air from both wards, w.c.'s, bath rooms, &c. (which are all connected with the flue), passes through a furnace which is heated up to at least 800 degrees, and therefore is more than sufficient to destroy all obnoxious germs. The working of the scheme has been properly tested by the anemometer, and it has been found that at least 10,000 cubic feet per hour per patient can be passed through the wards and out through the furnace, and that at the same time in cold weather a temperature of at least 60 degrees can still be maintained in the building."

Ample opportunity has been afforded during this outbreak, of testing the practical efficacy of this system. The narrow wards (14½ feet wide by 75 feet in length, and about 12 feet in height), each with a single row of beds, were found, when full of acute cases, to become so offensive as to require the free use of deodorants; and the lack of freshness in the air (in spite of the liberal cubic space per bed in about 10,000 cubic feet) seemed to have a deteriorating effect upon the patients.

It may also be added that several cases of small-pox occurred in the newly-built street situated just below this small-pox wing; and in general, Dr. Evans has shewn that there was a greater prevalence of the disease in that ward of the borough most exposed to the prevailing winds settling over the hospital in certain months.

The temporary hospital at Scholemoor, is an iron and wood structure erected on the extreme western boundary of the borough in a large field adjoining the cemetery, the lower lodge and road of which were appropriated to the service of the hospital. It was erected by Messrs. Humphreys, and consists of two parallel blocks of wards, which would accommodate 63 patients (at my visit on September 20 there were 38 in the building), the staff consisting of a matron and five nurses. The building was placed in telephonic communication with the fever hospital, and the sanitary offices at the Town Hall. It was opened for the reception of scarlet fever cases in May, when owing to the increase of small-pox, fever cases were no longer admitted into the Leeds Road Hospital. Subsequently it was decided to re-open the fever wards and to utilise the

* There are also seven men employed about the premises; two housemaids, two bedchamber maids, and the cook.

Bradford.

Scholemoor Hospital for small-pox. On September 9th cases of small-pox were admitted, some being transferred from the Leeds Road Hospital. On October 2nd the male ward at Scholemoor was destroyed by fire, and all the inmates had to be transferred to the Leeds Road Hospital, and were thus conveyed right through the centre of the borough. The streets were lined with sightseers, who also flocked to the burning building; and there can be little doubt that the increase of the disease in the town, a fortnight later was one of the ulterior consequences of this disaster.

Vaccination.—Owing to the courtesy of Drs. Bell, Foster, Lodge, and Munro, the public vaccinators of the four vaccination districts in Bradford, I am enabled to give the number of vaccinations performed by them during 1893, from the beginning of the year to November 2nd. Their returns will be found in Appendix V. They amount to—

2,036 primary vaccinations of children under 10 years.
112 primary vaccinations of persons aged 10 years and upwards.
22 re-vaccinations under the age of 10.
622 re-vaccinations over 10 years of age.

On May 10th, 1893, issued a handbill urging the importance of vaccination and revaccination, and on October 19th, the Sanitary Committee asked the medical practitioners of the borough if they would be willing to vaccinate persons applying to them at the expense of the Corporation (*see* Appendix VI.). This offer was accepted by the medical profession, and for a few weeks free vaccination and re-vaccination was largely adopted, as many as 10,853 persons undergoing it.

§ 2. *Previous Small-pox in Bradford.*

The prevalence of small-pox in Bradford during the past 20 years may be gathered from the records of the admission to hospital; but it must be borne in mind that the notification only came into force in 1881.

Bradford Fever Hospital.

Cases of Small-pox Admitted.

	Cases.	Deaths.
1872	63	6
1873	94	15
1874	249	48
1875	20	2
1876	12	—
1877	19	4
1878	5	1
1879	8	—
1880	2	1
1881	21	2
1882	26	3
1883	5	—
1884	3	—
1885	28	2
1886	4	—
1887	3	—
1888	16	2
1889	9	1
1890	—	—
1891	—	—
1892	25	4

Small-pox in Bradford, 1892.

There were 23 cases of small-pox notified in the borough during 1892, one half of these occurring in the months of July and August. The cases were only more than one per week in five weeks, in one of which there were four, and in the rest two each week. The first occurred in the week ending May 28th; after which none occurred for a month, when two were notified. The following is the return of these notifications per week :—

1892.

Week ending May 28	1 case.
,, June 4	—
,, ,, 11	—
,, ,, 18	—
,, ,, 25	2 ,,
,, July 2	—
,, ,, 9	—
,, ,, 16	1 case.
,, ,, 23	2 ,,
,, ,, 30	1 ,,
,, August 6	2 ,,
,, ,, 13	4 ,,
,, ,, 20	1 ,,
,, ,, 27	—
,, September 3	—
,, ,, 10	—
,, ,, 17	1 ,,
,, ,, 24	—
,, October 1	—
,, ,, 8	1 ,,
,, ,, 15	2 ,,
,, ,, 22	—
,, ,, 29	—
,, November 5	—
,, ,, 12	1 ,,
,, ,, 19	1 ,,
,, ,, 26	1 ,,
,, December 3	1 ,,
,, ,, 10	—
,, ,, 17	—
,, ,, 24	—
,, ,, 31	1 ,,

During the year 25 cases were treated in the small-pox wards of the Leeds Road Fever Hospital, viz., all those which occurred in the borough, and two others sent from an adjoining township.

I am indebted to Mr. Foster, resident medical officer of the hospital, for the following statistical analysis of these cases :—

Cases of Small-pox treated in the Bradford Fever Hospital, 1892.

Vaccinated.

—	Males.		Females.		Total.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Under 5 years	—	—	2	—	2	—
5-10 years	—	—	—	—	—	—
10-15 ,,	1	—	—	—	1	—
15-20 ,,	1	—	1	—	2	—
20-25 ,,	3	—	2	1	5	1
25-30 ,,	3	—	2	—	5	—
30-35 ,,	—	—	—	—	—	—
35-40 ,,	3	—	1	—	4	—
40-50 ,,	2	1	—	—	2	
Over 50 years	1	—	—	—	1	—
	14	1	8	1	22	2

Unvaccinated.

—	Males.		Females.		Total.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Under 5 years	—	—	1	1	1	1
5-10 years	—	—	—	—	—	—
10-15 ,,	—	—	—	—	—	—
15-20 ,,	—	—	—	—	—	—
20-25 ,,	1	—	—	—	1	—
25-30 ,,	—	—	—	—	—	—
30-35 ,,	—	—	—	—	—	—
35-40 ,,	1	1	—	—	1	1
40-50 ,,	—	—	—	—	—	—
Over 50 years	—	—	—	—	—	—
	2	1	1	1	3	2

Thus of the 25 cases, four were fatal; 16 were males (two deaths), nine females (two deaths); 22 were vaccinated, of whom two died; three unvaccinated, of whom two died.

§ 3. *Small-pox in Bradford*, 1893.

The disease continued to prevail, but not extensively during the first few months of the year; but in May the cases began to increase in numbers, and from that time onwards the disease became extremely prevalent, attaining its maximum in the months of October and November.

BRADFORD. 1893.

SMALL-POX NOTIFICATION.

Week ending.			4-week periods.
January	7	1	
,,	14	3	6
,,	21	1	
,,	28	1	
February	4	3	
,,	11	3	10
,,	18	3	
,,	25	1	
March	4	1	
,,	11	2	16
,,	18	6	
,,	25	7	
April	1	3	
,,	8	5	25
,,	15	3	
,,	22	14	
,,	29	20	
May	6	17	93
,,	13	35	
,,	20	21	
,,	27	13	
June	3	27	
,,	10	31	84
,,	17	13	
,,	24	13	
July	1	16	
,,	8	13	56
,,	15	14	
,,	22	23	
,,	29	29	83
August	5	15	
,,	12	16	
,,	19	17	
,,	26	13	73
September	2	33	
,,	9	10	
,,	16	21	
,,	23	26	123
,,	30	56	
October	7	40	
,,	14	43	
,,	21	82	176
,,	28	23	
November	4	28	
,,	11	79	
,,	18	49	195
,,	25	29	
December	2	38	
,,	9	30	
,,	16	8	
		978	

All but three of the cases of small-pox which were notified in the borough were removed to hospital for treatment. The three cases referred to were all fatal. They are appended to the Table VII. in Appendix. This table gives all the cases admitted into the Leeds Road Fever Hospital during the year, which were discharged up to November 18th. Consequently it does not embrace all the cases that arose within this period, since a large number were still retained under treatment at the date mentioned. Nor does it comprise every case that was admitted into Scholemoor Hospital before the fire caused its inmates to be transferred to the Leeds Road Hospital. Lastly, it includes three cases (two in February and one in September) admitted from outside the borough. I am indebted to the resident medical officer of the hospital for enabling me to copy the entries from his register, and more especially for kindly filling in many of the data given in this table as well as continuing the list up to November 18th.

BRADFORD.

It being understood, therefore, that the figures embrace only those patients who died or were discharged convalescent, and not those remaining under treatment at the time the list was completed, there is a total of 658 hospital cases available for analysis; of this number 350 were males, 308 were females; 80 of the total number died, or 12·1 per cent. of the male patients, 40 died, or 11·4 per cent.; of the female patients 40, or 12·6 per cent.

BRADFORD FEVER HOSPITAL.

CASES OF SMALL-POX admitted and discharged from December 31st, 1892, to November 18th, 1893.

Week ending—		Admitted.	Died.
1893.			
January	7	1	1
,,	14	3	—
,,	21	1	—
,,	28	2	1
February	4	7	—
,,	11	3	—
,,	18	3	—
,,	25	1	—
March	4	1	—
,,	11	2	—
,,	18	6	—
,,	25	8	—
April	1	3	—
,,	8	6	2
,,	15	5	—
,,	22	15	2
,,	29	21	2
May	6	18	—
,,	13	30	3
,,	20	23	2
,,	27	14	1
June	3	28	2
,,	10	28	1
,,	17	15	3
,,	24	11	1
July	1	16	2
,,	8	13	—
,,	15	12	1
,,	22	27	8
,,	29	25	—
August	5	17	1
,,	12	14	4
,,	19	16	3
,,	26	9	1
September	2	29	3
,,	9	7	2
,,	16	} Cases now taken to Scholemoor.	
,,	23		
,,	30	36	6
October	7	*54	5
,,	14	36	6
,,	21	57	6
,,	28	16	1
November	4	11	2
,,	11	7	7
,,	18	1	1
46 weeks		658	80

* 46 transferred from Scholemoor on October 2nd.

As the number of small-pox cases admitted into hospital increased, the accommodation provided by the special small-pox wing became inadequate so that it was necessary to give up first one fever ward and then another to small-pox. At the same time admission of scarlet fever cases was restricted, and in May was stopped altogether. For a short time there was no hospital provision for cases of scarlet fever, which had to be treated at their own houses; but steps were taken to erect at Scholemoor, a temporary hospital to which fever cases were sent. This arrangement prevailed during June to August, when it was decided to once more clear the fever wards of small-pox and re-admit mild cases into the fever hospital. With that object no more cases of fever were admitted into Scholemoor, and when it was emptied, all fresh cases of small-pox, as well as many of those still remaining in the Leeds Road Hospital, were sent (on September 9th) to Scholemoor. Thus during the weeks ending September 16 and 23, no cases of small-pox were admitted into the Leeds Road Hospital, and at the date of my visit (September 20th) only 20 cases of small-pox remained there, whilst the Scholemoor buildings were fully occupied.

BRADFORD.

Unfortunately, on October 2nd, a fire, due to a defective flue, broke out in one of the wards at Scholemoor, which necessitated the hurried transfer to Leeds Road of all its inmates, and the reversion to the previous plan of utilising the whole building for small-pox, scarlet fever again remaining without any hospital isolation.

The difficulties with which the authorities had to contend with owing to small-pox being admitted into the fever hospital may be gleaned by the following record of the closing and re-opening of fever wards during this period:—

January 28.—Ward 4 closed for scarlet fever, opened for isolation of four cases of very mild small-pox.
February 7.—Ward 4 closed for small-pox and fever.
April 1.—Re-opened for small-pox.
February 11.—Ward 3 closed for scarlet fever.
April 24.—Ward 3 opened for scarlet fever (males) transferred from ward 5, owing to outbreak of measles.
May 11.—Ward 3 opened for small-pox.
May 11.—Ward 2 closed for scarlet fever.
May 14.—Ward 2 opened for small-pox.
May 1.—Ward 1 closed for enteric fever.
May 1.—Ward 1 opened for scarlet fever.
May 11.—Ward 1 closed for scarlet fever.
May 17.—Ward 1 opened for small-pox.
April 24 *to May* 11.—Ward 5 closed for scarlet fever owing to outbreak of measles.

These changes are illustrated in Plate XXXII.

Cases of Small-pox arising in the Fever Hospital.

On April 1st, Ward 4 was permanently opened for admission of small-pox. A partition was erected in the corridor between Ward 3 and 4. There were no patients in No. 3 at this time. On April 24th, the scarlet fever patients were transferred to No. 3 and 2 from Ward 5 on account of outbreak of measles in latter Ward. On May 3 scarlet fever patients were transferred from No. 3 to No. 1 in order to remove them as far as possible from small-pox cases. This had not been possible before on account of a case of enteric fever in No. 1 who was discharged on May 1st. On May 11th the scarlet fever patients were moved back to No. 5 and No. 3 Ward opened for small-pox. Wards 1 and 2 were opened for small-pox on May 17.

On May 16, a man, J. R. (*see* Table No. 119) in No. 5 Ward, developed small-pox. He was one of those who had been transferred to Ward 3 on account of measles breaking out in Ward 5; and on May 8th he was moved farther away from the small-pox Ward (No. 4) to No. 1 Ward. He was sent back to No. 5 Ward on May 11th. He must have been infected about May 2nd, when occupying a bed in the ward adjacent to that containing small-pox cases. [This Ward (No. 3) is west of Ward 4, and at that time the prevailing winds were easterly.]

On June 3, B. L., an unvaccinated boy, æt. 7 (No. 236 in Table), was admitted with small-pox. He had been in hospital for scarlet fever, and was discharged on May 26th. He also was originally in No. 5 Ward, was shifted to No. 3 on the occurrence of measles there, and sent back to No. 5, where in all likelihood he was infected on May 16 by J. R.

A third patient, E. H., æt. 17, who was in No. 5 Ward for scarlet fever, and discharged on April 15, developed small-pox at York a few days afterwards. The mode of his infection when in hospital is not clear.

Weekly Return of Patients under Treatment in the Fever Hospital, suffering from Scarlet Fever and from Small-pox.—1893.

	Scarlet Fever.	Small-pox.
At close of week ending—		
January 7th	115	4
„ 14th	111	4
„ 21st	101	6
„ 28th	95	7
February 4th	97	8
„ 11th	96	10
„ 18th	98	12
„ 25th	91	12
March 4th	98	13
„ 11th	82	14
„ 18th	78	16
„ 25th	71	19
April 1st	64	24
„ 8th	70	24
„ 15th	66	24
„ 22nd	56	31
At close of week ending,—		
April 29th	53	49
May 6th	51	53
„ 13th	38	80
„ 20th	19	91
„ 27th	12*	92
June 3rd	6	97
„ 10th	—	115
„ 17th	—	108
„ 24th	—	90
July 1st	—	82
„ 8th	—	73
„ 15th	—	67
„ 22nd	—	75
„ 29th	—	86
August 5th	—	78
„ 12th	—	66
„ 19th	—	65
„ 26th	—	58
September 2nd	—	73

* No fresh cases admitted.

From this week most of the fresh cases arising were admitted into the Scholemoor hospital, and several of those in the Fever Hospital were transferred there. The fever wards had thus been vacated when, on October 2nd, a fire broke out at Scholemoor, and all its inmates were transferred to the Fever Hospital.

Type of Small-pox.

From the hospital register it appears that the 658 cases of small-pox admitted and discharged during the year up to 18th November (inclusive) comprised:—

10 hæmorrhagic cases	- -	10 fatal.
173 confluent „	- -	64 „
48 semi-confluent „	- -	6 „
283 discrete „		
144 mild (or modified) cases.		

These types are distributed amongst the various age-periods as follows:—

Table I.

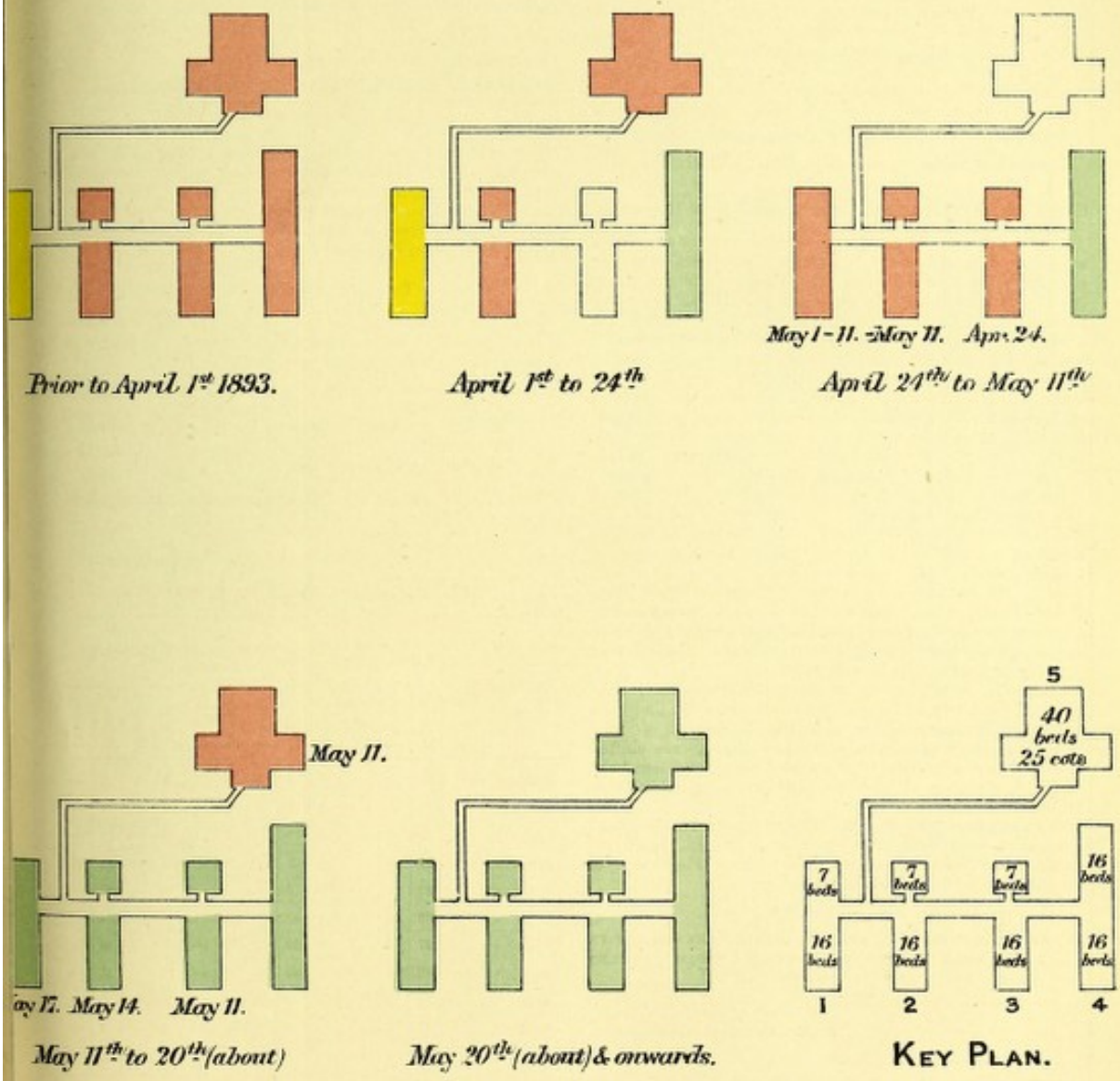
Type of Attack. Ages of Patients.

Age.	All Types.		Hæmorrhagic.		Confluent.		Semi-confluent.		Discrete.		Mild.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Under 1 year -	11	6	—	—	5	5	2	1	3	—	1	—
1-5 - -	28	10	1	1	12	8	3	1	10	—	2	—
5-10 - -	35	7	1	1	12	5	2	1	9	—	11	—
10-15 - -	57	6	—	—	23	6	5	—	17	—	12	—
15-20 - -	82	2	—	—	16	2	3	—	30	—	33	—
20-30 - -	203	15	3	3	41	11	11	1	104	—	44	—
30-40 - -	137	16	3	3	39	13	10	—	66	—	19	—
40-50 - -	66	10	—	—	20	10	10	—	25	—	11	—
50-60 - -	21	5	1	1	5	2	2	2	10	—	5	—
60-70 - -	14	3	1	1	2	2	—	—	6	—	4	—
70 and upwards	5	—	—	—	—	—	—	—	3	—	2	—
	658	80	10	10	173	64	48	6	283	—	144	—

In other words:—

	Hæmorrhagic.	Confluent.	Semi-confluent.	Discrete.	Mild.
	Per Cent.	Per Cent.	Per Cent.	Per Cent.	Per Cent.
At all ages -	10 or 1·6	173 or 26·3	48 or 7·3	283 or 42·7	144 or 21·9
Under 1 year -	—	5 „ 45·4	2 „ 18·1	3 „ 27·2	1 „ 9·1
1 to 10 years -	2 or 3·1	24 „ 38·1	5 „ 8·0	19 „ 30·1	13 „ 20·6
10 to 30 years -	3 „ 0·8	80 „ 23·4	19 „ 5·5	151 „ 44·1	89 „ 26·0
30 upwards -	5 „ 2·0	64 „ 26·7	22 „ 9·0	110 „ 45·4	41 „ 16·9

Diagram to Illustrate the Allocation of the Wards in the Bradford Fever Hospital during the Outbreak of Small Pox 1893.



Prior to April 1st 1893. April 1st to 24th April 24th to May 11th

May 11th to 20th (about) May 20th (about) & onwards. Key Plan.

Small Pox
Scarlet Fever
Enteric Fever

Wyman & Sons Ltd, Litt. 63, Carter Lane. 90-9-2-97

Showing a larger proportion of confluent and semi-confluent cases below the age of 10 years than in those above that age.

Of the 658 cases of small-pox here analysed—

498 were vaccinated, of whom 31 died ; mortality 6·2 per cent.
11 were undergoing vaccination when attacked, of whom 1 died ; mortality 9· per cent.
7 were alleged to have been vaccinated, but had no marks, of whom 3 died ; mortality 42·8 per cent.
14 the fact of vaccination is doubtful, of whom 3 died ; mortality 21·4 per cent.
128 were unvaccinated, of whom 42 died ; mortality 32·8 per cent.

[N.B.—It must be borne in mind that these rates are based on those who had left the hospital, and not on all admitted up to date.]

In the following table these are distributed according to the ages of the subjects :—

TABLE II.

CASES OF SMALL-POX.—VACCINATION RELATIONS.

—	Vaccinated.		"Under" Vaccination.		"Alleged" Vaccination.		Doubtful Vaccination.		Unvaccinated.		Total.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Under 1 year	—	—	2	—	—	—	—	—	9	6	11	6
1—5 years	2	—	2	—	—	—	—	—	24	10	28	10
5—10 „	15	—	2	1	—	—	—	—	18	6	35	7
10—15 „	29	—	1	—	1	1	1	—	25	5	57	6
15—20 „	64	1	3	—	1	—	1	—	13	1	82	2
20—30 „	178	7	—	—	2	—	1	—	22	8	203	15
30—40 „	123	11	—	—	1	1	6	2	7	2	137	16
40—50 „	57	5	—	—	1	1	1	—	7	4	66	10
50—60 „	16	4	—	—	1	—	3	1	1	—	21	5
60—70 „	11	3	1	—	—	—	—	—	1	—	13	3
70 and upwards	3	—	—	—	—	—	1	—	1	—	5	—
	498	31	11	1	7	3	14	3	128	42	658	80

or at larger age periods :—

—	Under 1 year.		1 to 10 years.		10 to 30 years.		30 and upwards.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Vaccinated	—	—	17	—	271	8	210	23
"Under" Vaccination.	2	—	4	1	4	—	1	—
"Alleged" Vaccination.	—	—	—	—	4	1	3	2
Doubtful Vaccination.	—	—	—	—	3	—	11	3
Unvaccinated	9	6	42	16	66	14	17	6
	11	6	63	17	362	23	242	34

Thus of the *vaccinated* :—

3·4 per cent. were between ages 1 and 10 years.
54·4 „ „ 10 and 30 „
42·1 „ „ 30 and upwards.

And of the *unvaccinated* :—

7·0 per cent. were under 1 year.
32·8 „ „ between 1 and 10 years.
46·8 „ „ „ 10 and 30 „
13·2 „ „ 30 and upwards.

Condition of Vaccination in Relation to the Type of Small-pox.—The following further analysis may be made of the various classes than that of the relative incidence of fatal and non-fatal cases ; the classes may be subdivided according to the relative number of cases of the various types of small-pox presented, the age incidence being here studied also.

Class A.—Vaccinated.

TABLE III.

TYPES OF SMALL-POX AMONGST THE VACCINATED.

—	Hæmorrhagic.		Confluent.		Semi-confluent.		Discrete.		Mild.		All Types.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Under 1 year	—	—	—	—	—	—	—	—	—	—	—	—
1—5 years	—	—	—	—	—	—	1	—	1	—	2	—
5—10 „	—	—	—	—	—	—	4	—	11	—	15	—
10—15 „	—	—	3	—	—	—	14	—	12	—	29	—
15—20 „	—	—	5	1	—	—	26	—	33	—	64	1
20—30 „	2	2	25	5	8	—	99	—	44	—	178	7
30—40 „	3	3	31	8	7	—	64	—	18	—	123	11
40—50 „	—	—	12	5	10	—	24	—	11	—	57	5
50—60 „	1	1	3	2	1	1	8	—	3	—	16	4
60—70 „	1	1	2	2	—	—	5	—	3	—	11	3
70 and over	—	—	—	—	—	—	2	—	1	—	3	—
	7	7	81	23	26	1	247	—	137	—	498	31

The increase in proportion of severe cases *pari passu* with increase in years is here shown, and more strikingly as follows :—

At ages.	Cases.	Mild.	Discrete.	Semi-confluent.	Confluent.	Hæmorrhagic.
		Per Cent.	Per Cent.	Per Cent.	Per Cent.	Per Cent.
1 to 10	17	12 or 70·6	5 or 29·4	—	—	—
10 „ 30	271	89 „ 32·8	139 „ 51·2	8 or 2·9	33 or 12·1	2 or 0·7
30 upwards	210	36 „ 17·1	103 „ 49·	18 „ 8·6	48 „ 22·8	7 „ 2·4

TABLE IV.

VACCINATED CLASS. NUMBER AND QUALITY OF SCARS.
TYPE OF SMALL-POX.

—		Hæmorrhagic.		Confluent.		Semi-confluent.		Discrete.		Mild.		All Types.	
		Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
4	Good	—		1				10		16		29	—
	Fair*	—		—		1		14		7		22	—
	Faint	—		—		—		4		2		6	—

* To avoid much complication, I have included the head of "fair." All these cases in which it is noted that the individual scars differed in quality :—*e.g.*, "2 faint, 1 good," or "1 fair, 1 faint," and so on. These details are to be found in the Table in Appendix, where also particulars as to area of scars are noted ; but these I have not attempted to analyse.

BRADFORD.

		Hæmorrhagic.		Confluent.		Semi-confluent.		Discrete.		Mild.		All Types.	
		Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
3	Good	—		5		2		41		29		77	—
	Fair	1	1	5		2		29		15		52	1
	Faint	—		2	1 (c)	—		5		2		9	1
	Not noted									2		2	—
4	Good	1	1	10		3		39		19		72	
	Fair	2	2	25	4	5		49		14		95	
	Faint	1	1	7	3	4	1	16 (b)		9		37	
	Not noted					1		2		1 (a)		4	
1	Good	—		8	2	—		12		7		27	2
	Fair	1	1	9	5	1		12		9		32	6
	Faint	1	1	8	5	5		14		5		32	6
	Not noted			1	1							1	1
		7	7	81	23	26	1	247		137		498	31

(a.) This case was successfully re-vaccinated upon attack of small-pox (No. 95 in Table).
(b.) One case successfully re-vaccinated five days before admission (No. 521 in Table).
(c.) This fatal case was successfully re vaccinated six days before admission (No. 528 in Table).

In the table of cases given in the Appendix, compiled from the hospital register kept by the medical superintendent, Mr. Foster, particulars are given of the number and quality of the scars borne by the vaccinated subjects. These I have summarised in the subjoined table, grouping them according to the number of the scars, and the quality under the three headings of "good," "fair," and "faint."

It will be seen that of the 498 subjects, 205 presented *good* marks, 202 *fair*, 84 *faint*, whilst in seven there is no note to this effect.

As to the number of marks, 57 had four scars, 140 had three scars, 208 had two scars, 92 had one scar, and in one the number is not noted.

Of the 31 fatal cases, 3 had "good" marks, 13 had "fair" marks, 14 had "faint" marks, and in one the quality is not noted.

Again, these 31 did not include a single person having 4 marks, but it comprised 2 with 3 marks, 14 with 2 marks, and 15 with 1 mark.

In the same way may be analysed the types of small-pox amongst the vaccinated subjects, which may be done summarily thus :—

Hæmorrhagic Cases.—7 (all fatal): having good marks, 1; fair, 4; faint, 2; or having 4 marks, none; 3 marks, 1; 2 marks, 4; 1 mark, 2.

Confluent Cases.—81 (23 fatal): having good marks, 24; fair, 39; faint, 17; quality not noted, 1; or having 4 marks, 1; 3 marks, 12; 2 marks, 42; 1 mark, 26. And of the fatal cases in this class, 2 had good marks, 9 fair, 11 faint, quality not noted in 1; or 1 had 3 marks, 9 had 2 marks, and 13 had 1 mark.

Semi-confluent Cases.—26 (1 fatal): having good marks, 7; fair, 9; faint, 9; quality not noted, 1; or 3 had 4 marks, 4 had 3 marks, 13 had 2 marks, 6 had 1 mark. The fatal case had 2 faint marks.

Discrete Cases (247): having good marks, 101; fair, 105; faint, 39; quality not noted, 2: or with 4 marks, 28; 3 marks, 75; 2 marks, 106; 1 mark, 38.

Mild Cases (137): having good marks, 72; fair, 45; faint, 17; quality not noted, 3; or with 4 marks, 25; 3 marks, 48; 2 marks, 43; 1 mark, 20; and in 1 the number is not noted.

The relative distribution of the types of vaccination amongst those of various ages is given in the following Tables of summaries :—

Vaccinated Class. Tables giving Number and Quality of Scars at different Ages.

Table IV.

—	Good.				Fair.				Faint.				Not Noted.			—
	4.	3.	2.	1.	4.	3.	2.	1.	4.	3.	2.	1.	3	2.	1.	
– 1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
– 5	—	1	1	—	—	—	—	—	—	—	—	—	—	—	—	2
– 10	2	2	2	1	1	4	1	1	—	—	—	—	1	—	—	15
– 15	5	3	4	2	5	2	4	1	1	—	—	1	1	—	—	29
– 20	9	21	5	4	1	12	3	4	—	1	4	—	—	—	—	64
– 30	9	41	31	11	4	20	29	13	2	2	7	8	—	1	—	178
– 40	4	8	24	5	6	11	36	4	1	3	12	7	—	2	—	123
– 50	—	1	4	4	5	1	15	4	1	3	8	10	—	1	—	57
– 60	—	—	1	—	—	2	4	3	—	—	4	2	—	—	—	16
– 70	—	—	—	—	—	—	3	1	1	—	1	4	—	—	1	11
70 +	—	—	—	—	—	—	—	1	—	—	1	1	—	—	—	3
	29	77	72	27	22	52	95	32	6	9	37	33	2	4	1	498
	205				201				85				7			

TABLE VI.

—	Four.			Three.				Two.				One.				Not Noted.	
	Good.	Fair.	Faint.	Good.	Fair.	Faint.	?.	Good.	Fair.	Faint.	?.	Good.	Fair.	Faint.	?.	Faint.	
– 1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
– 5	—	—	—	1	—	—	—	1	—	—	—	—	—	—	—	—	2
– 10	2	1	—	2	4	—	1	2	1	—	—	1	1	—	—	—	15
– 15	5	5	1	3	2	—	1	4	4	—	—	2	1	1	—	—	29
– 20	9	1	—	21	12	1	—	5	3	4	—	4	4	—	—	—	64
– 30	9	4	2	41	20	2	—	31	29	7	1	11	13	8	—	—	178
– 40	4	6	1	8	11	3	—	24	36	12	2	5	4	7	—	—	123
– 50	—	5	1	1	1	3	—	4	15	8	1	4	4	10	—	—	57
– 60	—	—	—	—	2	—	—	1	4	4	—	—	3	2	—	—	16
– 70	—	—	1	—	—	—	—	—	3	1	—	—	1	3	1	1	11
70 +	—	—	—	—	—	—	—	—	—	1	—	—	1	1	—	—	3
	29	22	5	77	52	9	2	72	95	37	4	27	32	32	1	1	498
	57			140				208				92				1	

Between ages 1 and 10.

17 cases.—4 marks	3	or good marks	9		
3 „	8	fair „	7		
2 „	4	faint „	0		
1 „	2	not noted	1	(recent.)	

Between ages 10 and 30.

271 cases.—4 marks	36	or good marks	145		
3 „	103	fair „	98		
2 „	88	faint „	26		
1 „	44	not noted	2		

Between ages 30 upwards.

210 cases.—4 marks	18	or good marks	51		
3 „	29	fair „	96		
2 „	116	faint „	59		
1 „	46	not noted	4		
not noted	1				

At all ages.

498 cases.—4 marks	57	or good marks	205		
3 „	140	fair „	201		
2 „	208	faint „	85		
1 „	92	not noted	7		
not noted	1				

Stated in per-centages, which admit of more ready comparison, the above data yield the following :—

—	Number of Marks.					Quality of Marks.			
	4.	3.	2.	1.	?	Good.	Fair.	Faint	Not noted.
1 to 10 years	17·6	47·	23·5	11·7	—	52·9	41·1	—	6·0
10 to 30 „	13·2	38·	32·4	16·2	—	53·5	36·1	9·6	0·7
30 years upwards.	8·5	13·8	55·2	21·9	0·5	24·3	45·7	28·6	1·9
At all ages	11·4	28·1	41·7	18·4	0·2	41·1	40·3	17·0	1·4

Class B.—"Under" Vaccination.

The 11 cases falling under this head comprise :—
Of *Mild* type, 1 under 1 year of age.
„ *Discrete* type, 5, viz., 1 under 1 year; 2 from 1 to 5; 1 from 1 to 10; and 1 at 60–70.
„ *Semi-confluent* type, 1 between 10 and 15 years.
„ *Confluent* type, 4, viz., 1 (fatal) between 5 and 10, and 3 between 15 and 20 years.

Class C.—"Alleged" Vaccination. No marks.

The 7 cases are thus distributed :—
Mild, no cases.
Discrete 3, viz., 2 between 20 and 30; 1 between 50 and 60 years.
Semi-confluent 1, between 15 and 20.
Confluent 3 (all fatal), viz., 1 at 10–15; 1 at 30–40; 1 at 40–50.

Class D.—"Doubtful" Vaccination.

The 14 cases in this class are distributed :—
Mild 1, at 60–70 years.
Discrete 5, viz., 2 at 30–40; 1 at 40–50; 1 at 50–60; and 1 over 70 years.
Semi-confluent 2, viz., 1 at 30–40; 1 (fatal) at 50–60.
Confluent 6, viz., 1 at 10–15; 1 at 15–20; 1 at 20–30; 3 (2 fatal) at 30–40.

Class E.—Unvaccinated.

The following table is drawn up, for the sake of comparison, precisely like that which refers to the type of small-pox amongst the vaccinated subjects :—

TABLE VII.

TYPES OF SMALL-POX AMONGST THE UNVACCINATED.

—	Hæmorrhagic.		Confluent.		Semi-confluent.		Discrete.		Mild.		All types.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Under 1 year	—	—	5	5	2	1	2	—	—	—	9	6
1 to 5 years	1	1	12	8	3	1	7	—	1	—	24	10
5 to 10 „	1	1	11	4	2	1	4	—	—	—	18	6
10 to 15 „	—	—	18	5	4	—	3	—	—	—	25	5
15 to 20 „	—	—	7	1	2	—	4	—	—	—	13	1
20 to 30 „	1	1	15	6	3	1	3	—	—	—	22	8
30 to 40 „	—	—	4	2	2	—	—	—	1	—	7	2
40 to 50 „	—	—	7	4	—	—	—	—	—	—	7	4
50 to 60 „	—	—	—	—	—	—	—	—	1	—	1	—
60 to 70 „	—	—	—	—	—	—	—	—	1	—	1	—
70 upwards	—	—	—	—	—	—	—	—	1	—	1	—
	3	3	79	35	18	4	23	—	5	—	128	42

Collating these in age-periods we have :—

—	Cases.	Mild.	Discrete.	Semi-confluent.	Confluent.	Hæmorrhagic.
Under 1 year	9	Per cent. None ·	Per cent. 2 or 22·2	Per cent. 2 or 22·2	Per cent. 5 or 55·5	Per cent. None.
1 to 10 years	42	1 or 2·3	11 or 26·2	5 or 11·9	23 or 54·7	2 or 4·7
10 to 30 „	60	None ·	10 or 16·6	9 or 15·	40 or 66·6	1 or 1·6
30 upwards ·	17	4 or 23·5	None.	2 or 11·7	11 or 64·7	None

BRADFORD.

Showing that the proportion of severe cases does not vary to anything like the same extent with the ages of the patients as among the vaccinated.

COMPARISON of the VACCINATED and UNVACCINATED.

PROPORTIONS of TYPES of SMALL-POX.

		Proportions of Types of Small-pox.				
		Under 1 year.	1 to 10 years.	10 to 30 years.	30 upwards.	At all Ages.
		Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Mild	Vaccinated	—	70·6	32·8	17·1	27·8
	Unvaccinated	—	2·3	—	23·5	3·9
Discrete	Vaccinated	—	29·4	51·2	49·	49·8
	Unvaccinated	22·2	26·2	16·6	—	17·9
Semi-confluent	Vaccinated	—	—	2·9	8·6	5·2
	Unvaccinated	22·2	11·9	15·	11·7	14·
Confluent	Vaccinated	—	—	12·1	22·8	16·2
	Unvaccinated	55·5	54·7	66·6	64·7	61·7
Hæmorrhagic	Vaccinated	—	—	0·7	2·4	1·4
	Unvaccinated	—	4·7	1·6	1·6	2·3

Or, expressing the same relative proportions in another way, these figures show that at all ages, the ratio of the vaccinated to the unvaccinated was :—

In the mild types	- -	as 7 : 1
,, discrete ,,	- -	,, 28 : 1
,, semi-confluent types	-	,, 1 : 2·7
,, confluent ,,	-	,, 1 : 3·8
,, hæmorrhagic ,,	-	,, 1 : 1·6

Further, that the like ratios—

At ages 1 to 10 were in—

Mild type	- - -	as 30·7 : 1
Discrete type	- - -	,, 1·1 : 1

And at ages of 10 to 30 they were in cases of—

Discrete type	- - -	3 : 1
Semi-confluent type	- -	1 : 5·1
Confluent ,,	- -	1 : 5·5
Hæmorrhagic ,,	- -	1 : 2·2

And at ages 30 years and upwards they were in cases of—

Mild type	- - -	1 : 1·3
Semi-confluent type	- -	1 : 1·3
Confluent ,,	- -	1 : 2·8
Hæmorrhagic ,,	- -	1 : 1·5

CONCLUSIONS.

1. The sanitary organisation of Bradford is complete and satisfactory.

2. The provision for isolation of small-pox cases was found to be inadequate, the special block constructed for that purpose in the grounds of the Leeds Road Fever Hospital becoming filled by April 1893.

3. This necessitated the devotion of some of the wards (and later of the entire building) to small-pox, whilst the four patients were admitted to a temporary hospital at Scholemoor.

4. The Scholemoor building was opened for small-pox in the month of September, but its destruction by fire, a calamity which favoured the spread of the disease in the borough, compelled the re-opening of the Leeds Road Hospital to small-pox.

5. The sanitary authorities spared no pains to cope with the rapid extension of the epidemic in the summer and autumn of 1893, and there was marked promptitude in removal of cases, disinfection of houses and effects, for which the appliances are excellent.

6. Gratuitous public re-vaccination was carried on a large scale at the expense of the Corporation in the month of June.

I desire to thank Dr. W. Arnold Evans and Mr. A. E. Foster for their kindness and courtesy in affording me information, as well as for rendering me much personal assistance.

S. C.

London, March 22, 1894.

LIST OF APPENDICES.

I. *Vital Statistics of Bradford.*
II. *Notification Certificate.*
III. *Extract from Inspector's Report of Infected Houses.*
IV. *Forms sent to Schools and Factories.*
V. *Public Vaccination Returns*, 1893.
VI. *Extract from Minutes of Sanitary Committee.*
(a.) *Relating to free Vaccination and Re-vaccination.*
(b.) *Relating to Facilities for free Distribution of Disinfectants.*
VII. *Table of Cases of Small-pox treated in Hospital*, 1893.
VIII. *Bradford Small-pox*, 1893. *Number of Infected Houses, &c.*
IX. *Bradford Union: Vaccination Returns*, 1872–1892.

APPENDIX I.

Vital Statistics of Bradford (from Report of Medical Officer of Health for the year 1891, *p.* 2).

TABLE SHOWING CORRECTED POPULATION. BIRTH-RATE AND MORTALITY RATES from 1882–1891.

Year.	Corrected Estimate of Population to middle of each year.	Annual Rate per 1,000 living.		
		Birth-rate.	Death-rate.	Zymotic-rate.
1882 - - - - - - -	197,103	31·59	21·01	3·2
1883 - - - - - - -	199,214	29·88	18·77	1·5
1884 - - - - - - -	201,347	30·86	21·13	2·6
1885 - - - - - - -	203,504	30·55	18·62	1·5
1886 - - - - - - -	205,684	30·55	20·35	2·3
1887 - - - - - - -	207,887	29·83	21·44	2·9
1888 - - - - - - -	210,113	29·82	18·66	1·6
1889 - - - - - - -	212,364	29·53	21·15	2·9
1890 - - - - - - -	214,634	29·10	23·21	2·3
1891 - - - - - - -	216,938	28·64	22·12	2·35

APPENDIX II.

Form of Notification Certificate issued to Medical Practitioners.

COUNTY BOROUGH OF BRADFORD.

To the Medical Officer of Health.

Name_____

Address_____

Disease_____

Date_____ 189 .

1. Name in full of person suffering from disease.

2. No. or name of the house, and name of the street or road, and parish or place, where person is resident. In the case of a ship, boat, tent, van, shed, or other similar structure, the name or description of the dwelling, and the name of the place where it is situate, should be given.

3. Name of disease.

THE INFECTIOUS DISEASE (NOTIFICATION) ACT, 1889.

CERTIFICATE OF MEDICAL PRACTITIONER.

COUNTY BOROUGH OF BRADFORD.

To the Medical Officer of Health.

I hereby certify and declare, that in my opinion[1]_____

_____ aged _____

an inmate of[2]_____

is suffering from[3]_____

Dated the _____ day of _____ 189 ___

(Signed)_____

Medical Practitioner.

N.B.—This Certificate must (under a penalty not exceeding forty shillings), be sent to the Medical Officer of Health forthwith on the Medical Practitioner attending on or called in to visit the patient becoming aware that the patient is suffering from an infectious disease to which the Act applies; namely, any of the following diseases: Small-pox, cholera, diphtheria, membranous croup, erysipelas, the disease known as scariatina or scarlet fever, and the fevers known by any of the following names: typhus, typhoid, enteric, relapsing, continued or puerperal, and also any infectious disease to which the Act has been applied by the Local Authority in manner provided by the Act.

The form is endorsed by the following:—

"If, in the opinion of the medical practitioner, removal of a patient to the Fever Hospital is desirable, he will greatly oblige by stating this on the line below. Prompt arrangements can then be made for removal."

BRADFORD.

APPENDIX III.

Inspectors' Reports on Cases of Infectious Disease.

Name and Address of Patient.	School Attendance.				Milk Supply.	
	No.	Week Days.	No.	Sundays.	Vendor.	Farmer.
F—— H——, 358, W—— Rd. -	—	Nil.		Nil.	——	W. Dawson, Tong.
G—— C——, 1, C—— St. -	3	Wapping Road Board	4	Spiritualist, Otley Road.	Jas. Jagger, Bolton Lane	F. Ward, Cullingworth.
A—— O——, 12, S—— Bldgs.	1	Bowling Bk. Lane Board.	—	Nil.	No regular supply.	
A—— C——, 269, Gt. H—— Rd.	2	All Saints, Horton	4	Parish Church, Captain Street.	——	Mr. Ingham, Thornton.
	2	Dirkhill Mission				
	1	Technical College				

APPENDIX IVA.

Officer of Health's Department,
Town Hall, Bradford,
_____ 189 .

DEAR SIR,

I BEG to inform you that there is a case of dangerous infectious disease at the house of a pupil attending your Sunday School as below.

The child should not be allowed to return to school until you have proper certification that it can do so without danger to itself or to its companions. I would also impress on you that no other child from the infected house should be allowed to attend school until all danger of the disease being spread by it among your pupils has ceased.

I am, yours truly,
W. ARNOLD EVANS,
Medical Officer of Health.

Name.	Address.

N.B.—In addition to those infectious diseases which are notified to the Sanitary Authority, and about which I am enabled to give you information as above, there are others of a no less infectious character which are not notified. Among these are measles and whooping-cough, which are at times widely prevalent, and cause a good many deaths. The same care should be exercised with regard to children and premises infected by these diseases, as is called for in the case of the diseases to which my letter above refers. Your careful supervision to prevent these diseases among your pupils will be of the greatest service.

APPENDIX IVB.

Officer of Health's Department,
Town Hall, Bradford,
_____ 189 .

DEAR SIR,

I BEG to inform you that a case of small-pox has been removed from the house of one of your workpeople as below. If you suspect that any other persons in your employ are suffering from the disease, I shall be glad to visit them if you will kindly give me the address.

Yours faithfully,
W. ARNOLD EVANS,
Medical Officer of Health.

Name.	Address.

APPENDIX IVC.

Notification to Heads of Factories, &c.

Officer of Health's Department,
Town Hall, Bradford,
_____ 189 .

SIR,

I BEG to inform you that _____ having undergone the necessary period of quarantine is free from infection and may with safety resume work.

I am, yours truly,
W. ARNOLD EVANS,
Medical Officer of Health.

APPENDIX IVD.

Notification to School Authorities.

Officer of Health's Department,
Town Hall, Bradford,
_____ 189.

SIR,

I BEG to inform you that at the following premises the process of disinfection has been carried out, and the children may return to school on the _____

I am, yours truly,
W. ARNOLD EVANS,
Medical Officer of Health.

APPENDIX V.

Public Vaccination. Bradford.

—	Primary Vaccination.		Re-vaccinated.	
	Under 10.	Over 10.	Under 10.	Over 10.
Dr. Munro (1st District):				
January 1 to September 24 -	572	22	1	42
September 24 to November 4 -	195	19	8	75
Dr. Bell (West District):				
January 1 to September 20 -	338	10	—	36
September 27 to November 1 -	139	7	1	25
Dr. Lodge (3rd District):				
January 1 to September 21 -	319	7	3	74
September 21 to November 2 -	141	21	—	94
Dr. Foster (Horton District):				
January 1 to September 21 -	243	5	2	18
September 25 to October 31 -	89	21	7	258
	2,036	112	22	622

APPENDIX VI.

Extract from Minutes of the Sanitary Committee.

At a Special Meeting of the Sanitary Committee held at the Town Hall on the 19th October 1893, at 5 p.m.

Mr. Alderman Hardaker in the chair.
&c. &c. &c.

SMALL-POX.

Read draft of letter proposed to be sent to each medical practitioner in the Borough, of which the following is a copy :—

Health Department,
Town Hall, Bradford,
DEAR SIR, October 18th, 1893.

IN consequence of the continued prevalence of small-pox, especially amongst the unvaccinated portion of the community, the Sanitary Authority are desirous of extending the protection against this disease given by vaccination and re-vaccination.

I have therefore been instructed to ask you to be good enough to answer the question on the fly-leaf hereof, and return the form as soon as possible.

Yours faithfully,
W. ARNOLD EVANS,
Medical Officer of Health.

Are you prepared to vaccinate any persons calling at your surgery, provided the Corporation make themselves responsible for payment for such vaccination, of 2*s.* for each successful case of primary vaccination, and 1*s.* 6*d.* for each case of re-vaccination ?

Whereupon it was

Resolved :

That the draft letter as now submitted be and the same is hereby approved.

Resolved :

That the Chairman, Deputy-chairman, Mr. Alderman Lister, and Messrs. Councillors Robinson, Howroyd, L. Walker, Popplewell, Sheldon, and Booth be a sub-committee, with full power to take all such steps as they may deem expedient for the suppression of the disease of small-pox now prevalent within the Borough.

BRADFORD.

Health Department,
Town Hall, Bradford,
DEAR SIR, October 20th, 1893.

I AM instructed by the Sanitary Committee to ask you to vaccinate any inhabitant of the borough, who may make application to you, and to re-vaccinate any inhabitant above the age of 12 years who may also apply.

On being furnished with a certified list of the persons vaccinated, the Corporation will pay a fee of 2*s.* 6*d.* for each case.

Yours faithfully,
W. ARNOLD EVANS,
Medical Officer of Health.

SMALL-POX.

At a Meeting of the Sanitary Sub-Committee held at the Town Hall on the 20th October 1893, at 4.15 p.m.

PRESENT :

Aldermen Hardaker, Lister.
Councillors Howroyd, Popplewell, Robinson, Sheldon, Louis Walker.

Mr. Alderman Hardaker in the chair.

Resolved (unanimously) :

That as authorised by the Finance and General Purposes Committee at their meeting to-day, the room in the buildings in Chapel Lane belonging to the Corporation, which was occupied last winter for the purpose of the Labour Bureau, be set apart for the free distribution of disinfectants for use in houses where infectious disease has occurred or may occur.

That a separate telephone be forthwith provided in the said room so as to afford the best possible facilities for enabling relatives and friends of patients in the Hospital having direct communication with such patients.

And, further, that it be an instruction to the Medical Officer of Health to appoint a suitable person to take charge of the said room, attend to the said telephone, and also to distribute disinfectants.

APPENDIX VII.

Table of Cases of Small-pox admitted into the Bradford Fever Hospital, 1893.

This Table is prepared from the Register of Cases kept by the Medical Superintendent, Mr. A. E. Foster, M.R.C.S. The cases have been entered after their discharge from the hospital, and hence they do not appear in the Table in the chronological order of their admission. Mr. Foster has kindly supplied the data of vaccination, of which he takes careful notes; and I am also indebted to him for extending the Table for a month subsequent to my visit as well as for supplying other information to be found in it.

No.	Name.	Sex.	Age.	Day of Rash.	Day of Disease on Admission.	Date of Admission to Hospital.	Date of Discharge.	Type.	Result.	Days in Hospital.	Vaccination Marks.				Remarks.
											Date.	No.	Character.	Area.	
1.	2.	3.	4.	5.		7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
1	S. S.	F.	3	4th	6th	1893. January 7	1893. January 9	Confluent	Died	3	—	—	—	—	Unvaccinated.
2	J. M.	M.	49	3rd	11th	„ 12	February 15	Discrete	Recovered	35	Infancy	2	1 good and 1 fair	¾ inch	
3	J. S.	M.	26	3rd	5th	„ 12	„ 25	Confluent	„	44	„	2	1 good and 1 fair	½ „	
4	W. H. J.	M.	30	3rd	4th	„ 14	March 18	„	„	64	„	3	Small	½ „	
5	P. M.	M.	22			„ 16	„ 3	Discrete	„	34	„	1	Very faint	¾ „	From Union Workhouse.
6	G. G.	F.	20	3rd	3rd	„ 28	January 30	Hæmorrhagic	Died	3	„	2	Fair	½ „	Nos. 6 to 11 are members of same family
7	W. G.	M.	11			„ 30	February 7	Mild*	Recovered	9	„	3			*The term "modified" used in Hospital Register is here replaced by that of "mild." It signifies cases where the eruption has not become distinctly pustular.
8	O. G.	M.	8			„ 30	„ 7	„	„	9	„	3	Fair		
9	A. G.	F.	17			„ 30	„ 7	„	„	9	„	4	Good		
10	A. G.	F.	17			„ 30	„ 7	„	„	9	„	2	Fair		
11	A. G.	M.	28			„ 30	„ 12	„	„	14	„	2	1 good and 1 fair		
12	S. H.	F.	12	3rd	4th	„ 30	March 15	„	„	45	„	4	Good	1 inch	
13	W. C.	M.	39	1st	5th	February 2	„ 15	„	„	42	„	4	1 good and 3 faint		
14	J. M.	M.	50	3rd	6th	„ 6	„ 15	„	„	38	—	—	—	—	Unvaccinated. Same house as No. 5.
15	H. M.	F.	32	4th	5th	„ 8	April 19	Confluent	„	71	Infancy	2	Fair	½ inch	
16	M. J. J.	F.	34	5th	5th	„ 9	March 22	Mild	„	42	—	—	—	—	Unvaccinated.
17	J. W.	M.	35	2nd	5th	„ 12	April 5	Confluent	„	73	Infancy	2	1 good and 1 fair	¼ inch	From Union Workhouse.
18	A. H.	M.	27	3rd	9th	„ 13	„ 22	„	„	69	„	2	Good	¾ „	
19	M. S.	F.	20	4th	6th	„ 14	March 25	Discrete	„	40	„	2	1 good and 1 faint	½ „	
20	C. G.	M.	25	4th	5th	„ 22	April 19	„	„	67	„	2	Fair	½ „	
21	M. A. M.	M.	62	2nd	5th	„ 27	„ 8	„	„	41	Recent	3	Vesicles		"Under vaccination."
22	T. G.	M.	46	5th	7th	„ 24	June 21	Confluent	„	148	—	—	—	—	Unvaccinated.
23	J. W.	M.	36	3rd	6th	March 8	April 8	Discrete	„	32	Infancy	2	Good	1¼ inch	

APPENDIX VII.—*continued.*

No.	Name.	Sex.	Age.	Day of Rash.	Day of Disease on Admission.	Date of Admission to Hospital.	Date of Discharge.	Type.	Result.	Days in Hospital.	Vaccination Marks.				Remarks.
											Date.	No.	Character.	Area.	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
						1893.	1893.								
24	A. D.	M.	12	4th	5th	March 11	May 6	Confluent	Recovered	56	—	—	—	—	Unvaccinated.
25	A. H.	M.	40	3rd	8th	„ 14	March 25	Mild	„	12	Infancy	2	1 good and 1 faint	½ inch	
26	F. C.	M.	24	3rd	5th	„ 15	„ 22	„	„	8	„	4	Good	1½ „	
27	M. S.	F.	22	3rd	6th	„ 16	April 5	„	„	21	„	4	Fair	¾ „	
28	F. C. S.	M.	32	4th	7th	„ 16	„ 8	„	„	24	„	2	Good	½ „	
29	T. J.	M.	13	2nd	8th	„ 20	May 6	Confluent	„	48	„	1	Very faint	¾ „	
30	C. H.	M.	46	3rd	5th	„ 17	April 15	Mild	„	39	„	2	Faint	½ „	
31	M. B.	F.	25	4th	5th	„ 21	May 6	„	„	47	„		Fair	½ „	
32	H. McK.	F.	25	2nd	4th	„ 21	„ 6	„	„	47	„	2	1 fair and 1 faint	½ „	
33	M. B.	F.	27			„ 21	April 29	Confluent	„	40	„	3	1 good and 2 faint	½ „	Same house as No. 31.
34	A. P. C.	M.	24	3rd	3rd	„ 22	„ 15	Mild	„	25	„	2	Very good	1 „	
35	W. D.	M.	18	4th	5th	„ 22	„ 19	„	„	29	„	3	Good	1 „	Same house as No. 34.
36	S. D.	M.	33	3rd	6th	„ 22	„ 19	Discrete	„	29	„	2	Fair	¾ „	Union workhouse.
37	S. L.	M.	46	3rd	4th	„ 22	May 6	Confluent	„	46	„	1	Good	½ „	„
38	E. B.	F.	19	4th	8th	„ 15	„ 17	„	„	64	„	1	„	½ „	
39	A. P.	M.	53			„ 31	„ 31	„	„	62	„	2	Fair	¼ „	
40	T. B.	M.	24	3rd	3rd	„ 28	June 3	„	„	68	„	2	Very good	¾ „	
41	W. H. L.	M.	5	3rd	3rd	„ 26	May 6	Discrete	„	42	Recent	—	—	—	Vaccinated 3 days before attack, "Under" vaccination. Same house as No. 28.
42	R. C.	M.	40	5th	8th	April 2	April 29	Mild	„	28	Infancy	1	Very good	½ inch	Union workhouse.
43	E. H.	M.	30	3rd	6th	„ 3	„ 9	Confluent	Died	7	—	—	—	—	Vaccination doubtful.
44	A. B.	M.	7	4th	5th	„ 5	„ 8	Mild	Recovered	9	Infancy	2	Good	½ inch	
45	E. C.	M.	21	1st	5th	„ 3	May 3	Discrete	„	31	„	3	„	1 „	
46	W. S.	M.	30			„ 3	April 9	Confluent	Died	7	?	0	—	—	Vaccination alleged, no marks.
47	J. H. B.	M.	32	3rd	4th	„ 20	„ 29	„	„	10	Infancy	1	Good	½ inch	
48	G. B.	M.	30	4th	4th	„ 19	„ 30	„	„	12	—	—	—	—	Unvaccinated.
49	H. Q.	F.	2			„ 24	„ 30	„	„	7	—	—	—	—	„
50	H. B.	M.	48	4 h	4th	„ 25	May 3	„	„	9	Infancy	1	Faint	½ inch	
51	W. E.	M.	30	4th	5th	March 31	„ 13	Discrete	Recovered	44	„	2	1 fair and 1 faint	½ „	
52	A. C.	M.	31			April 15	„ 24	Mild	„	40	„	4	Very good	2 „	Employed at Sanger's Circus.
53	J. S.	M.	2			„ 15	„ 17	Discrete	„	33	—	—	—	—	Unvaccinated.

BRADFORD.

APPENDIX VII.—*continued.*

No.	Name.	Sex.	Age.	Day of Rash.	Day of Disease on Admission.	Date of Admission to Hospital.	Date of Discharge.	Type.	Result.	Days in Hospital.	Vaccination Marks.				Remarks.
											Date.	No.	Character.	Area.	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
						1893.	1893.								
54	J. M.	M.	14	4th	4th	April 19	May 13	Mild	Recovered	25	Infancy	3	Good	¾ inch	
55	L. G.	F.	40	4th	6th	„ 25	„ 20	„	„	26	„	1	Fair	¼ „	
56	H. M. F.	F.	16	5th	8th	„ 27	„ 20	„	„	24	„	3	Good	1 „	
57	C. S. E.	M.	29	5th	5th	„ 22	„ 17	Discrete	„	26	„	1	„	¼ „	
58	J. E. H.	M.	25	3rd	4th	„ 21	„ 17	Mild	„	27	„	2	Very good	1½ „	
59	W. N. R.	M.	19	3rd	4th	„ 22	„ 17	„	„	26	„	4	„	2 „	
60	S. A. W.	F.	27	6th	6th	„ 24	„ 13	Discrete	„	20	„	2	Small	¼ „	
61	M. E. T.	F.	17	3rd	4th	„ 22	„ 13	Mild	„	22	„	3	Fair	½ „	
62	S. A. O.	F.	21			„ 26	„ 13	Discrete	„	18	„	3	Very good	1 „	
63	W. C.	M.	26	4th	3rd	„ 23	„ 13	Mild	„	21	„	2	„	1 „	
64	F. C	M.	25	5th	8th	„ 28	„ 13	Discrete	„	16	„	2	Fair	¼ „	
65	H. B.	M.	18	3rd	10th	„ 26	„ 10	Mild	„	15	„	3	„	½ „	
66	S. E. S.	F.	16	4th	7th	„ 24	„ 27	„	„	34	„	3	„	½ „	
67	F. R.	F.	11			„ 29	„ 27	Discrete	„	29	—	—	—	—	Unvaccinated.
68	H. H.	M.	51	3rd	5th	„ 22	„ 28	Mild	„	37	—?	0	—	—	Vaccination doubtful.
69	T. H. M.	M.	20	3rd	5th	„ 20	„ 20	„	„	31	Infancy	4	Very good	1 inch	
70	G. J. B.	M.	35	4th	6th	„ 21	„ 22	Discrete	„	32	„	2	Very faint	¼ „	
71	M. A. B.	F.	23	7th	9th	„ 25	„ 24	„	„	30	„	4	Fair	1 „	
72	P. J. D.	F.	22	3rd	3rd	„ 17	„ 31	„	„	45	„	1	Faint	¼ „	
73	T. B.	M.	32	3rd	4th	„ 29	„ 31	Mild	„	33	„	3	Fair	½ „	
74	T. H. B.	M.	32	3rd	4th	„ 10	June 3	Confluent	„	55	„	2	Good	1 „	
75	J. B.	M.	40	2nd	5th	„ 17	„ 3	„	„	48	„	2	„	¼ „	
76	R. H. W.	M.	39	4th	4th	„ 24	„ 3	Discrete	„	41	„	2	1 good and 1 faint		
77	C. M.	M.	31	3rd	5th	„ 21	„ 3	„	„	44	„	4	Fair	½ „	
78	J. W.	M.	11	5th	6th	„ 4	„ 3	Confluent	„	61	—	—	—	—	Unvaccinated.
79	J. S.	F.	58	3rd	4th	„ 25	„ 7	„	„	44	Infancy	2	Very faint	¼ inch	
80	J. R. C.	M.	10			„ 10	„ 10	„	„	54	„	2	Foveate	¼ „	
81	S. A. W.	F.	18	6th	6th	„ 25	„ 14	Discrete	„	51	„	1	Good	¼ „	
82	W. H.	M.	45	7th	7th	„ 29	„ 14	Confluent	„	47	„	1	„	¼ „	
83	E. H.	M.	27	2nd	5th	„ 28	„ 14	Discrete	„	53	„	2	Fair	¼ „	
84	F. W.	M.	7			„ 20	„ 21	„	„	54	—	—	—	—	Unvaccinated.

APPENDIX VII.—*continued.*

No.	Name.	Sex.	Age.	Day of Rash.	Day of Disease on Admission.	Date of Admission to Hospital.	Date of Discharge.	Type.	Result.	Days in Hospital.	Vaccination Marks.				Remarks.
											Date.	No.	Character.	Area.	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
						1893.	1893.								
85	F. H.	M.	21	4th	5th	April 13	June 21	Confluent	Recovered	70	—	—	—	—	Unvaccinated. (Member of Sanger's Circus.)
86	S. C.	M.	6			„ 22	„ 17	„	„	57	—	—	—	—	Unvaccinated.
87	A. K.	M.	37	4th	4th	„ 24	„ 24	„	„	62	Infancy	2	Fair	½ inch	
88	R. G.	M.	28	4th	4th	„ 12	July 5	„	„	85	„	3	1 fair and 2 faint		Member of Sanger's Circus.
89	S. J. W.	F.	4			„ 29	„ 8	„	„	71	—	—	—	—	Unvaccinated.
90	B. S.	M.	31	6th	8th	May 5	May 24	Discrete	„	20	Infancy	3	2 good and 1 fair		
91	A. G.	M.	23	4th	6th	„ 3	„ 20	„	„	18	„	3	Good	1 inch	
92	G. G.	M.	62			„ 13	„ 18	Confluent	Died	6	„	1	?	½ „	
93	A. B.	M.	43	3rd	3rd	„ 10	„ 17	„	„	8	„	2	1 good and 1 faint		
94	J. B.	M.	22	4th	7th	„ 13	„ 13	Mild	Recovered	11	„	1	Fair	1¼ „	
95	T. B.	M.	27	4th	5th	„ 10	„ 27	„	„	18	„	2	?	¾ „	Two recent vesicles of *re-vaccination*.
96	A. L.	F.	34	3rd	6th	„ 1	„ 27	Discrete	„	22	„	2	Good	¼ „	
97	T. T.	M.	14	4th	4th	„ 11	„ 23	Confluent	Died	13	—	—	—	—	Unvaccinated.
98	C. F.	F.	69	4th	7th	„ 9	„ 24	Mild	Recovered	16	—	—	—	—	Unvaccinated. Had small-pox at two years of age.
99	W. W.	M.	24	4th	9th	„ 5	„ 20	Discrete	„	16	Infancy	3	Good	1¼ inch	
100	M. D.	F.	12			„ 14	„ 21	Confluent	Died	8	—	—	—	—	Unvaccinated.
101	B. B.	F.	47	3rd	8th	„ 14	„ 31	Mild	Recovered	18	Infancy	2	1 good and 1 faint	½ inch	
102	E. B.	F.	26	6th	9th	„ 14	„ 31	Discrete	„	18	„	2	Very faint	¼ „	
103	E. F.	F.	47	3rd	5th	„ 11	„ 31	Mild	„	21	„	2	Faint	¼ „	
104	F. B.	M.	8	4th	4th	„ 6	„ 31	„	„	26	„	4	Fair	¾ „	
105	A. B.	M.	25	5th	5th	„ 5	„ 31	Discrete	„	27	„	2	Good	1 „	
106	J. F.	M.	18	3rd	5th	„ 23	June 3	Mild	„	12	„	3	Very good	1¼ „	
107	M. J. S.	F.	35	4th	5th	„ 15	„ 3	„	„	20	„	2	Fair	½ „	
108	S. J. S.	F.	38	4th	5th	„ 8	„ 3	Discrete	„	27	—	?			Vaccination doubtful.
109	E. S.	F.	22	3rd	5th	„ 16	„ 3	Mild	„	19	Infancy	4	Good	1 „	
110	S. L.	M.	26	4th	5th	„ 10	„ 3	Discrete	„	23	„	2	Fair	½ „	
111	R. H.	M.	26	3rd	3rd	„ 9	„ 3	Mild	„	26	„	2	Good	¾ „	
112	M. B.	F.	20	2nd	5th	„ 16	„ 7	„	„	23	„	1	Fair	¼ „	
113	M. C.	F.	34	5th	5th	„ 2	„ 7	Discrete	„	37	„	4	2 fair and 2 faint	¾ „	
114	I. W.	F.	17	4th	6th	„ 12	„ 7	„	„	27	„	3	Fair	¾ „	
115	M. P.	F.	55	4th	4th	„ 17	„ 7	Mild	„	22	„		Faint	¼ „	

BRADFORD.

APPENDIX VII.—*continued.*

No.	Name.	Sex.	Age.	Day of Rash.	Day of Disease on Admission.	Date of Admission to Hospital.	Date of Discharge.	Type.	Result.	Days in Hospital.	Vaccination Marks.				Remarks.
											Date.	No.	Character.	Area.	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
						1893.	1893.								
116	W. A.	M.	60	1st	4th	May 10	June 7	Mild	Recovered	29	Infancy	1	Faint		Re-vaccinated in Army some years ago.
117	A. W. S.	M.	27	3rd	6th	„ 19	„ 7	Discrete	„	22	„	3	Fair	½ inch	
118	J. S.	M.	33	3rd	3rd	„ 13	„ 7	Mild	„	26	„	2	Good	1 „	
119	J. R.	M.	25	3rd	3rd	„ 16	„ 7	Discrete	„	23	„	3	„	½ „	Contracted small-pox in Hospital.
120	H. T.	F.	6			„ 29	„ 7	Confluent	Died	6	—	—	—	—	Unvaccinated.
121	N. H.	F.	9			„ 6	„ 8	Mild	Recovered	34	Infancy	3	Fair	½ inch	From Union Workhouse.
122	L. H.	F.	7			„ 6	„ 8	„	„	34	„	3	2 good and 1 fair	½ „	„
123	F. N.	F.	15	4th	4th	„ 14	„ 10	Discrete	„	28	„	2	Good	½ „	
124	L. T.	F.	33	4th	6th	„ 14	„ 10	Mild	„	28	„	3	Fair	½ „	
125	A. T.	M.	7	5th	5th	„ 11	„ 10	Discrete	„	31	—	—	—	—	Unvaccinated. Same house as No. 120.
126	M. E. H.	F.	31	3rd	5th	„ 2	„ 14	Confluent	„	44	Infancy	2	Fair	½ inch	
127	F. H.	M.	18	3rd	3rd	„ 11	„ 14	Discrete	„	35	„	3	2 good and 1 faint	1 „	Same house as No. 82.
128	E. H.	M.	34	3rd	3rd	„ 29	„ 14	„	„	17		3	Good	½ „	
129	T. M.	M.	30	1st	4th	„ 28	„ 17	Mild	„	21	„	1	Very good	½ „	From Union Workhouse
130	M. P.	F.	38	4th	8th	„ 6	„ 17	Confluent	„	43	?	?	—	—	Vaccination doubtful.
131	E. C.	F.	20	4th	10th	„ 5	„ 17	„	„	44	—	—	—	—	Unvaccinated.
132	M. H.	F.	15	4th	4th	„ 25	„ 17	Mild	„	24	Infancy	4	Very good	1 inch	
133	E. L.	F.	14	3rd	5th	„ 26	„ 17	„	„	23	„	3	„	1½ „	
134	A. M.	F.	28	4th	5th	„ 12	„ 17	Discrete	„	37	„	1	Fair	½ „	
135	J. J.	M.	17	3rd	3rd	„ 26	„ 17	Mild	„	23	„	4	Very good	1½ „	
136	J. T. T.	M.	41	5th	6th	„ 30	„ 21	Discrete	„	23		4	2 fair and 2 faint	½ „	
137	J. K.	F.	4			„ 27	„ 24	„	„	29	Recent	2	Vesicles	½ „	"Under" vaccination: 9 days before admission.
138	E. C.	M.	12			„ 7	„ 24	Confluent	„	49	—	—	—	—	Unvaccinated.
139	N. H.	M.	4			„ 18	„ 25	„	Died	37	—	—	—	—	„
140	E. L.	F.	20	1st	3rd	„ 4	„ 28	Discrete	Recovered	56	Infancy	1	Faint	½ inch	
141	S. A. H.	F.	9	3rd	6th	„ 28	„ 28	„	„	32	„	3	1 good and 2 faint		
142	J. B.	F.	11	3rd	4th	„ 10	„ 28	Confluent	„	50	—	—	—	—	„
143	A. H.	M.	54	2nd	5th	„ 14	„ 28	„	„	46	Infancy	2	Good	1 inch	
144	J. W. H.	M.	11			„ 6	„ 29	„	„	55	„	2	Fair	½ „	
145	C. T.	M.	12	4th	4th	„ 11	July 1	„	„	52	—	—	—	—	„ Same house as No. 120.
146	J. F.	M.	14	3rd	3rd	„ 23	„ 1	„	„	40	—	—	—	—	„

BEADFORD.

APPENDIX VII.—*continued.*

No.	Name.	Sex.	Age.	Day of Rash.	Day of Disease on Admission.	Date of Admission to Hospital.	Date of Discharge.	Type.	Result.	Days in Hospital.	Vaccination Marks. Date.	No.	Character.	Area.	Remarks.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
						1893.	1893.								
147	C. S.	M.	27	3rd	5th	May 21	July 1	Discrete	Recovered	42	Infancy	2	1 fair and 1 faint	—	
148	J. H.	M.	24	3rd	5th	„ 22	June 18	Confluent	Died	28	„	1	Faint	½ inch	
149	M. L. H.	F.	12			„ 18	„ 21	Discrete	Recovered	35	—	—	—	—	Unvaccinated.
150	E. B.	F.	29	3rd	5th	„ 17	„ 21	„	„	36	Infancy	2	Good	¾ inch	
151	J. S.	F.	33	2nd	4th	„ 6	„ 21	Confluent	„	47	„	2	Fair	½ „	
152	T. M.	M.	27	4th	5th	„ 31	July 5	„	„	36	„	2	Good	1 „	
153	M. A. S.	F.	34	3rd	4th	„ 31	„ 5	Discrete	„	36		4	2 fair and 2 faint	—	
154	M. L. H.	F.	14	4th	4th	„ 17	„ 5	„	„	50	„	2	Fair	½ inch	From Union Workhouse.
155	E. H.	F.	17	5th	5th	„ 9	„ 8	Confluent	„	61	Recent	—	—	—	"Under" vaccination.
156	S. H.	F.	15	5th	5th	„ 10	„ 8	„	„	60	„	—	—	—	„ „ Same house as No. 155.
157	E. K.	F.	9			„ 16	„ 8	„	„	54	—	—	—	—	Unvaccinated.
158	H. K.	M.	34	2nd	3rd	„ 26	„ 8	„	„	44	Infancy	2	1 fair and 1 faint	½ inch	
159	A. McC.	M.	32	3rd	5th	„ 12	„ 8	„	„	58	„	2	Fair	½ „	
160	H. F.	M.	12			„ 6	„ 8	„	„	64	—	1?	—	—	Vaccination doubtful.
161	J. L.	M.	42	4th	6th	„ 30	„ 8	Discrete	„	40	Infancy	2	Good	¾ inch	
162	W. S.	M.	36	3rd	3rd	„ 10	„ 8	„	„	60	„	3	„	¾ „	
163	J. R.	M.	42	4th	5th	„ 8	„ 10	„	„	64	„	2	„		
164	A. K.	F.	5			„ 15	„ 12	Confluent	„	59	—	—	—	—	Unvaccinated.
165	J. F.	M.	36	4th	5th	„ 29	„ 12	„	„	45	Infancy	2	1 good and 1 faint		
166	G. P.	M.	34	3rd	3rd	„ 21	„ 12	„	„	53	„	2	Good	¾ inch	
167	W. A.	M.	31	3rd	4th	„ 14	„ 12	„	„	60	—	—	—	—	
168	F. L.	F.	60	3rd	4th	„ 27	„ 15	Discrete	„	50	Infancy	4	Faint	¾ inch	
169	S. F.	F.	40	3rd	4th	„ 14	„ 15	Confluent	„	63	„	2	Fair	¾ „	
170	T. S.	M.	21	3rd	5th	„ 30	„ 15	„	„	47	„	1	„	½ „	
171	A. H.	M.	14	5th	6th	„ 11	„ 15	„	„	66	—	—	—	—	„
172	J. E. C.	M.	4			„ 16	„ 15	„	„	61	—	—	—	—	„
173	G. E. C.	M.	19	3rd	4th	„ 25	„ 19	„	„	56	—	—	—	—	„
174	J. D.	M.	23	3rd	6th	„ 8	„ 19	„	„	73	—	—	—	—	„
175	E. L.	F.	45	4th	4th	„ 26	„ 19	Semi-confluent	„	55	Infancy	2	1 fai and 1 faint	½ inch	
176	J. A. B.	M.	17	5th	5th	„ 10	„ 19	Discrete	„	71	—	—	—	—	„
177	F. R.	M.	18	3rd	3rd	„ 11	August 19	Confluent	„	101	—	—	—	—	„

APPENDIX VII.—*continued.*

No.	Name.	Sex.	Age.	Day of Rash.	Day of Disease on Admission.	Date of Admission to Hospital.	Date of Discharge.	Type.	Result.	Days in Hospital.	Vaccination Marks.				Remarks.
											Date.	No.	Character.	Area.	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
						1893.	1893.								
178	A. H.	F.	31	3rd	4th	May 6	August 5	Confluent	Recovered	92	Infancy	4	Good	1 inch	From Union Workhouse.
179	F. T.	F.	10	4th	4th	„ 11	„ 9	„	„	91	—	—	—	—	Unvaccinated. Same houses as Nos. 129 and 124.
180	E. B.	F.	6			„ 30	July 26	„	„	58	—	—	—	—	Unvaccinated.
181	G. J.	M.	45			„ 26	„ 25	„	„	62	Infancy	1	Good	½ inch	
182	W. F.	M.	4			„ 19	„ 26	„	„	69	—	—	—	—	„
183	H. T.	M.	22	3rd	4th	„ 15	„ 26	„	„	73	—	—	—	—	Unvaccinated. Same houses as Nos. 120, 124, 129.
184	W. T.	M.	20	5th	5th	„ 8	September 2	„	„	118	Infancy	3	Very good	1½ inch	
185	S. A. B.	F.	31			June 7	June 13	„	Died	7	„	2	Faint	½ „	
186	J. P.	M.	35	3rd	5th	„ 7	„ 21	Mild	Recovered	15	„	2	„	½ „	
187	A. B.	F.	30			„ 7	July 1	Discrete	„	25	„	1	Fair	1½ „	
188	J. A. B.	M.	20	3rd	3rd	„ 16	„ 1	„	„	16	„	3	Very good	1 „	
189	M. E. G.	F.	6 months.			„ 17	„ 1	„	„	15	—	—	—	—	Unvaccinated.
190	E. G.	F	29	6th	9th	„ 7	„ 1	„	„	25	Infancy	2	Good	1 inch	Same house as No. 189.
191	J. J.	F.	28	3rd	9th	„ 14	„ 1		„	18	„	3	Fair	½ „	
192	R. L.	F.	11	3rd	4th	„ 14	„ 1	Mild	„	18	„	4	Good	½ „	
193	A. H.	M.	36	4th	6th	„ 5	„ 1	Discrete	„	27	„	2	„	1½ „	
194	J. C.	M.	25	?	8th	„ 5	„ 1	„	„	27	„	3	Very good	1 „	
195	B. C.	F.	61			„ 20	1	Mild	„	12	„	1	Fair	½ „	
196	J. G. G.	M.	18	4th	5th	„ 6	June 28	Discrete	„	23	„	4	Good	2 „	
197	W. W.	M.	29	6th	6th	„ 8	„ 28	Mild	„	21	„	1	„	¼ „	
198	J. H. G.	M.	23	3rd	7th	„ 10	„ 28	Discrete	„	19	„	2	Very large	1 „	
199	M. O.	F.	11			„ 6	„ 28	„	„	24	„	4	Fair	¾ „	
200	L. L.	F.	9 months.			„ 21	„ 24	Confluent	Died	4	—	—	—	—	Unvaccinated.
201	G. L.	F.	6			„ 16	„ 24	„	„	9	—	—	—	—	„
202	W. H. S.	M.	42	3rd	3rd	„ 17	„ 23	„	„	7	Infancy	2	Faint	½ inch	
203	F. W.	F.	6			„ 15	„ 21	Haemorrhagic	„	7	—	—	—	—	
204	E. W.	F.	13			„ 3	„ 24	Mild	Recovered	22	Infancy	1	Very good	½ inch	
205	E. L.	F.	23	3rd	6th	„ 3	„ 24	Discrete	„	22	„	3	Fair	½ „	
206	C. W.	F.	20	5th	10th	„ 8	„ 24	„	„	17	„	2	1 fair and 1 faint	½	
207	S. K.	F.	12			„ 5	„ 24	„	„	20	„	2	Good	½	
208	L. M.	M.	29	4th	6th	„ 8	„ 24	Mild	„	17	„	2	Faint	„	

APPENDIX VII.—*continued.*

No.	Name.	Sex.	Age.	Day of Rash.	Day of Disease on Admission.	Date of Admission to Hospital.	Date of Discharge.	Type.	Result.	Days in Hospital.	Vaccination Marks.				Remarks.
											Date.	No.	Character.	Area.	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
209	E. W.	F.	26	2nd	7th	1893. June 7	1893. June 24	Mild	Recovered	18	Infancy	2	Fair	½ inch	
210	N. H.	M.	35	4th	4th	„ 6	„ 24	Discrete	„	19	„	2	„	½ „	
211	C. H. W.	M.	17	2nd	7th	„ 5	„ 21	Mild	„	17	„	5	Very good	3 „	
212	W. H.	M.	20			„ 5	„ 21	Discrete	„	17	„	3	2 fair and 1 faint	½ „	Sent from Infirmary.
213	A. N.	F.	9			„ 5	„ 21	„	„	17	„	2	Very good	½ „	
214	E. C.	F.	5			„ 3	„ 18	Confluent	Died	16	—	—	—	—	Unvaccinated.
215	M. A.	F.	23	4th	7th	„ 2	„ 17	Discrete	Recovered	16	Infancy	2	Fair	½ inch	
216	J. W. S.	M.	18	4th	4th	„ 1	„ 17	Mild	„	17	„	3	„	1½ „	Same family.
217	A. S.	F.	47	5th	6th	„ 1	„ 17	„	„	17	„	4	Faint	½ „	
218	E. S.	F.	7	3rd	7th	„ 1	„ 17	„	„	17	„	3	Very good	1½ „	
219	R. K.	M.	18	3rd	7th	„ 2	„ 17	„	„	16	„	1	Fair	½ „	
220	R. G.	M.	27	4th	7th	„ 2	„ 17	Discrete	„	16	„	1	„	½ „	
221	A. J.	M.	38	3rd	6th	„ 2	„ 17	„	„	16	„	2	1 fair and 1 faint	½ „	
222	J. C.	F.	17	3rd	4th	„ 8	July 5	„	„	28	„	3	2 good and 1 fair	¾ „	
223	A. M. H.	F.	45	5th	7th	„ 8	„ 5	„	„	28	„	2	Good	½ „	
224	M. F.	F.	14	3rd	3rd	„ 19	„ 5	Mild	„	17	„	4	Fair	1½ „	
225	M. P.	M.	20	5th	9th	„ 21	„ 5	„	„	15		3	Very good	1½ „	
226	M. A. K.	F.	47	5th	6th	„ 1	„ 5	Discrete	„	35	„	3	Faint	½ „	
227	E. D.	F.	42	4th	4th	„ 3	„ 5	„	„	33	„	1	„	¾ „	
228	F. H.	F.	18	3rd	3rd	„ 3	„ 5	„	„	33	„	3	Very good	¾ „	
229	A. L.	M.	39	3rd	4th	„ 29	„ 6	Confluent	Died	8	—	—	—	—	Unvaccinated.
230	K. K.	F.	24	3rd	4th	„ 16	„ 8	Discrete	Recovered	23	Infancy	1	Good	½ inch	
231	R. E.	M.	14	3rd	5th	17	„ 8	Mild	„	22	„	3	„	½ „	
232	H. L.	M.	5			„ 28	„ 8	Confluent	Died	11	—	—	—	—	Unvaccinated.
233	Mrs. J.	F.	37	4th	4th	„ 16	„ 10	Discrete	Recovered	25	Infancy	1	Faint	½ inch	
234	M. C.	F.	20			„ 17	„ 12	„	„	26	„	3	Fair	1 „	
235	A. W.	M.	21	3rd	8th	„ 4	„ 12	Confluent	„	39	„	3	Good	¾ „	
236	R. L.	M.	7			„ 3	„ 8	„	„	36	—	—	—	—	Unvaccinated. Infected in hospital.
237	M. A. S.	F.	18	2nd	3rd	„ 1	„ 15	Discrete	„	45	Infancy	3	Good	1½ inch	
238	S. A. F.	F.	20	4th	4th	„ 22	„ 15	„	„	24	„	3	„	¾ „	
239	R. F.	M.	27	3rd	3rd	„ 5	„ 15	„	„	41	„	3	„	1 „	

APPENDIX VII.—*continued.*

No.	Name.	Sex.	Age.	Day of Rash.	Day of Disease on Admission.	Date of Admission to Hospital.	Date of Discharge.	Type.	Result.	Days in Hospital.	Vaccination Marks.				Remarks.
											Date.	No.	Character.	Area.	
1.	2.	3.	4.	5	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
						1893.	1893.								
240	J. J.	M.	18	3rd	3rd	June 28	July 15	Mild	Recovered	18	Infancy	3	Very good	1 inch	
241	T. F.	M.	50	2nd	3rd	„ 16	„ 15	„	„	30	„	1	Faint	½ „	
242	G. H.	M.	14	4th	3rd	„ 5	„ 19	Confluent	„	45	—	—	—	—	Unvaccinated.
243	M. W.	F.	9	4th	4th	„ 14	„ 19	Discrete	„	36	Infancy	4	Good	¼ inch	
244	H. G.	M.	32	3rd	5th	„ 16	„ 19	„	„	34	„	4	Fair	½ „	
245	J. T. C.	M.	49	3rd	4th	„ 22	„ 19	„	„	28	„	3	Bad	½ „	
246	B. S.	M.	15	2nd	3rd	„ 3	August 19	Confluent	„	78	?	?	—	—	Vaccination doubtful.
247	G. H.	M.	21	3rd	9th	„ 28	„ 12	„	„	46	Infancy	1	Good	¼ inch	
248	C. S.	M.	21	6th	6th	„ 6	„ 12	„	„	68	„	3	„	1 „	
249	N. S.	M.	13	4th	6th	„ 29	„ 12	„	„	44	—	—	—	—	Unvaccinated.
250	R. S.	M.	46	3rd	4th	„ 26	„ 5	„	„	41	—	—	—	—	„
251	J. A.	M.	28	4th	4th	„ 17	„ 9	Discrete	„	54	Infancy	1	Fair	¼ inch	
252	E. E.	M.	21	4th	4th	„ 28	„ 9	„	„	43	„	4	Very good	2 „	
253	M. E. W.	F.	17	4th	6th	„ 28	July 22	„	„	25	—	—	—	—	
254	E. P.	M.	22	4th	6th	„ 26	„ 22	Mild	„	27	Infancy	3	Fair	1 inch	
255	C. T.	F.	28	4th	7th	„ 23	August 2	Confluent	„	41	„	2	1 fair and 1 faint	½ „	
256	A. W.	F.	40	6th	6th	„ 8	„ 5	Semi-confluent	„	59	„	2	—	—	
257	P. G.	M.	36			„ 2	July 29	Confluent	„	58	„	2	Fair	¼ inch	
258	C. S.	F.	10 weeks.			„ 26	„ 26	Semi-confluent	„	31	—	—	—	—	„
259	A. D.	F.	38	2nd	3rd	„ 7	„ 26	„	„	50	?	?	—	—	Vaccination doubtful.
260	M. E. G.	F.	23			„ 7	„ 26	Discrete	„	50	Infancy	3	2 fair and 1 faint	½ inch	
261	T. G.	F.	6			„ 4	„ 26	Mild*	„	53	„	3	Good	½ „	*Described as a "modified" (confluent) case.
262	— N.	M.	19	4th	8th	„ 27	August 23	Confluent	„	58	—	—	—	—	Unvaccinated.
263	T. L.	M.	9	3rd	3rd	„ 19	„ 23	„	„	66	—	—	—	—	„
264	F. P.	M.	23	4th	5th	„ 29	September 2	„	„	65	Infancy	2	Good	¼ inch	
265	L. C.	F.	17	3rd	3rd	„ 23	August 23	„	„	62	—	—	—	—	„
266	A. P.	F.	34	5th	7th	„ 24	September 16	Semi-confluent	„	85	—	—	—	—	„
267	G. H.	M.	47	3rd	3rd	„ 21	„ 28	„	„	92	Infancy	2	Fair	½ inch	
268	G. P.	M.	38	4th	4th	July 1	July 17	Discrete	„	17	„	2	Very faint	½ „	
269	A. D.	M.	31	5th	10th	„ 3	„ 19	„	„	17	„	2	Very good	1 „	
270	H. H.	M.	29	4th	6th	„ 31	August 16	Mild	„	17	„	3	„	1 „	

Appendix VII.—*continued.*

No.	Name.	Sex.	Age.	Day of Rash.	Day of Disease on Admission.	Date of Admission to Hospital.	Date of Discharge.	Type.	Result.	Days in Hospital.	Vaccination Marks.				Remarks.
											Date.	No.	Character.	Area.	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
271	E. D.	F.	40	2nd	6th	1893. July 27	1893. August 16	Mild	Recovered	21	Infancy	3	Good	2 inches	
272	D. W.	M.	19	5th	5th	„ 28	„ 16	„	„	20	„	3	Very good	2 „	
273	C. S.	F.	29	2nd	4th	„ 13	„ 19	Confluent	„	38	„	2	Fair	½ „	
274	N. B.	F.	6			„ 10	„ 19	„	„	41	—	—	—	—	Unvaccinated.
275	S. W.	M.	25	3rd	3rd	„ 20	„ 12	Discrete	„	24	Infancy	2	Good	1 inch	
276	S. B.	M.	20	3rd	5th	„ 3	„ 12	Confluent	„	39	„	1	„	½ „	
277	J. T. M.	M.	21		14th	„ 12	„ 12	„	„	32	—	—	—	—	„
278	G. B.	M.	1			„ 16	„ 12	Discrete	„	28	—	—	—	—	„
279	H. S.	M.	30	4th	7th	„ 10	„ 12	„	„	34	Infancy	3	Good	¼ inch	
280	S. W.	M.	68	3rd	5th	„ 21	„ 11	Hæmorrhagic*	Died	22	„	1	Faint	½ „	*Described as "discrete (hæmorrhagic)."
281	S. B.	F.	70	3rd	6th	„ 31	„ 12	Mild	Recovered	13		2	„	½ „	
282	R. D.	F.	50	5th	7th	„ 19	„ 12	Discrete	„	25	?	?	—	—	Vaccination doubtful.
283	A. P.	M.	24	3rd	7th	„ 27	„ 12	Mild	„	17	Infancy	3	Good	1 inch	
284	L. C.	M.	24	5th	8th	„ 27	„ 12	„	„	17	„	2	Fair	½ „	
285	S. A. L.	F.	30	5th	5th	„ 20	„ 12	Discrete	„	24	„	2	1 fair and 1 faint	½ „	
286	M. T.	F.	24	5th	6th	„ 22	„ 12	„	„	22	„	1	Very good	¼ „	
287	S. D.	F.	21		8th	„ 26	„ 12	„	„	18	„	3	„	1 „	
288	G. E. W.	F.	38		9th	„ 14	„ 12	Confluent	„	30	„	2	Fair	„	
289	T. L.	M.	6	3rd	6th	„ 5	„	Mild	„	32	„	1	„	½ „	
290	W. S.	M.	39	3rd	3rd	„ 21	„ 5	„	„	16	„	2	Good	¼ „	
291	J. P.	M.	25	4th	6th	„ 18	„ 5	„	„	19	„	3	Very ood	2 „	
292	M. B.	M.	38	3rd	7th	„ 25	„ 5	Discrete	„	12	„	2		2 „	
293	J. L.	M.	10		7th	„ 26	„ 5	Mild	„	11	„	4	Fair	½ „	
294	T. P.	M.	8			„ 24	„ 5	Discrete	„	13	„	1	Good	½ „	
295	W. H. B.	M.	8	3rd	25th	„ 7	„ 5	„	„	30	—	—	—	—	Unvaccinated.
296	G. C.	M.	19	4th	9th	„ 25	„ 5	„	„	12	Infancy	3	Good		
297	M. A. R.	F.	39	4th	5th	„ 17	„ 5	„	„	20	„	2	Fair	½ inch	
298	J. D.	M.	21	6th	11th	„ 26	„ 9	Mild	„	15	„	3	Good	¼ „	
299	F. R.	M.	38	4th	5th	„ 20	„ 9	Discrete	„	21	„	2	„	½ „	
300	G. T. K.	M.	29	5th	11th	„ 24	„ 9	Mild	„	16	„	2	Very good	1 „	
301	F. A.	M.	21	5th	8th	„ 24	„ 9	„	„	17	„	2	Fair	½ „	

Bradford.

APPENDIX VII.—*continued.*

No.	Name.	Sex.	Age.	Day of Rash.	Day of Disease on Admission.	Date of Admission to Hospital.	Date of Discharge.	Type.	Result.	Days in Hospital.	Vaccination Marks.				Remarks.
											Date.	No.	Character.	Area.	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
						1893.	1893.								
302	H. D.	M.	31	3rd	7th	July 27	August 9	Mild	Recovered	14	Infancy	2	Very good	2 inches	
303	J. A.	F.	28	5th	6th	„ 22	„ 9	Discrete	„	19	„	2	Good	1 „	
304	H. M. B.	F.	16	3rd	3rd	„ 29	„ 9	„	„	21	„	2	Fair	¼ „	
305	E. S.	F.	13			„ 21	„ 9	„	„	20	„	4	Very good	1¼ „	
306	M. S.	F.	46	4th	5th	„ 17	„ 9	„	„	24	„	2	Fair	½ „	
307	S. J.	F.	39	4th	5th	„ 20	„ 9	„	„	21	„	2	Good	1 „	
308	H. M. J.	F.	40			„ 23	„ 9	„	„	18	„	1	Faint	¼ „	
309	E. D.	F.	16	3rd	8th	„ 1	July 22	„	„	22	„	2	1 good and 1 faint	½ „	
310	K. S.	F.	32	3rd	7th	„ 2	„ 22	„	„	21	„	3	Fair	¼ „	
311	A. C.	F.	28	5th	6th	„ 1	„ 22	Mild	„	22	„	2	Very good	¼ „	
312	J. S.	M.	11			„ 5	„ 22	„	„	18	„	3	Fair	¼ „	
313	E. N.	F.	20 months.			„ 17	„ 20	Confluent	Died	4	—	—	—	—	Unvaccinated.
314	E. H.	F.	26	3rd	4th	„ 22	August 1	„	„	11	—	—	—	—	„
315	J. B.	M.	40	4th	7th	„ 21	1	„	„	12	Infancy	2	Fair	¼ inch	
316	W. N.	M.	41	3rd	5th	„ 22	July 31	„	„	10	—	—	—	—	„
317	A. W.	M.	22			„ 17	August 2	Discrete	Recovered	17	Infancy	3	Very good	1 inch	
318	T. R.	M.	18	1st	3rd	„ 18	„ 2	„	„	16	„	3	„	2 „	
319	F. J.	F.	14	3rd	3rd	„ 5	„ 2	„	„	29	„	2	Good	¼ „	
320	H. W.	F.	18	3rd	3rd	„ 11	„ 2	„	„	23	„	3	2 fair and 1 faint	¼ „	
321	B. B.	F.	60			„ 3	„ 8	„	„	37	„	2	Fair	¼ „	
322	E. H.	F.	38	4th	7th	„ 13	„ 5	„	„	24	„	2	„	¼ „	
323	E. H.	F.	21	4th	5th	„ 4	July 29	„	„	26	„	2	Very good	¼ „	
324	J. B.	F.	2	4th	8th	„ 8	„ 29	„	„	22	„	3	Good	¼ „	
325	A. B.	F.	25	3rd	4th	„ 20	„ 28	Confluent	Died	9	„	1	Fair	¼ „	
326	A. F.	F.	22	4th	4th	„ 17	„ 25	Hæmorrhagic	„	9	„	2	Good	1 „	
327	M. A. K.	F.	11	6th	7th	„ 10	„ 26	Discrete	Recovered	17	„	4	Fair	¼ „	
328	E. W.	F.	15			„ 8	„ 26	Mild	„	19	„	3	Good	1 „	
329	E. W.	F.	45	3rd	3rd	„ 12	„ 25	Confluent	Died	14	—	—	—	—	„
330	R. B.	M.	2			„ 16	„ 23	„	„	8	—	—	—	—	„
331	F. W. W.	M.	39	3rd	3rd	„ 20	August 23	Discrete	Recovered	35	Infancy	2	Bad	¼ inch	
332	P. M.	M.	4			„ 26	„ 23	„	„	29	Recent	2	Vesicles		"Under" vaccination 6 or 7 days.

APPENDIX VII.—*continued.*

No.	Name.	Sex.	Age.	Day of Rash.	Day of Disease on Admission.	Date of Admission to Hospital.	Date of Discharge.	Type.	Result.	Days in Hospital.	Vaccination Marks.				Remarks.
											Date.	No.	Character.	Area.	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
						1893.	1893.								
333	J. W.	M.	31	4th	4th	July 26	August 26	Semi-confluent	Recovered	32	Infancy	2	Good	1 inch	
334	J. K.	M.	42			„ 25	September 2	Confluent	„	40	—	—	—	—	Unvaccinated.
335	G. H.	M.	38	3rd	5th	„ 22	„ 2	Semi-confluent	„	43	—	—	—	—	„
336	A. C.	F.	4			„ 31	August 23	Mild	„	24	Infancy	2	Good	½ inch	
337	E. B.	F.	4			„ 11	September 2	Discrete	„	54	—	—	—	—	„
338	A. B. B.	F.	31	5th	6th	„ 25	August 22	Semi-confluent	„	29	Infancy	1	Poor	½ inch	
339	A. D.	F.	27	2nd	5th	„ 24	September 9	Confluent	„	48	—	—	—	—	„
340	M. T.	M.	78			„ 29	August 30	Mild	„	33	—	—	—	—	Unvaccinated. Small-pox in infancy. Sent from union workhouse.
341	C. S.	M.	29	2nd	5th	„ 1	„ 30	Confluent	„	61	?	?	—	—	Doubtful vaccination.
342	H. G.	M.	16	3rd	4th	„ 28	September 9	Semi-confluent	„	44	—	—	—	—	Unvaccinated.
343	P. H.	M.	37	5th	5th	„ 26	„ 9	Confluent	„	46	Infancy	1	Fair	½ inch	
344	J. B.	M.	26	2nd	6th	„ 25	„ 6	„	„	46	„	3	„	2 „	
345	E. C.	M.	4			„ 18	August 26	„	„	40	—	—	—	—	„
346	E. M.	M.	20	5th	5th	„ 14	„ 26	„	„	44	—	—	—	—	„
347	C. C.	M.	13			„ 31	September 2	Discrete	„	34	—	—	—	—	„
348	C. S.	F.	33	3rd	4th	„ 5	„ 9	Confluent	„	67	Infancy	2	Fair	½ inch	
349	C. W.	M.	33	4th	5th	„ 31	„ 16	„	„	48	„	2	„	½ „	
350	W. M.	M.	16	3rd	3rd	„ 29	„ 25	„	„	57	—	—	—	—	
351	W. H.	M.	84			„ 14	„ 20	Discrete	„	69	?	?			Vaccination doubtful. From workhouse.
352	A. N.	F.	14	2nd	4th	„ 8	„ 20	Confluent	„	75	—	—	—	—	Unvaccinated.
353	R. D.	M.	5			„ 20	„ 20	Semi-confluent	„	53	—	—	—	—	„
354	Z. S.	M.	19	4th	5th	August 19	August 28	Confluent	Died	10	—	—	—	—	„
355	T. K.	M.	28	4th	6th	„ 16	„ 27	Semi-confluent	„	12	—	—	—	—	„
356	G. H.	M.	15	4th	7th	„ 14	„ 30	Discrete	Recovered	17	Infancy	2	Very good	1 inch	
357	J. G.	M.	24	3rd	5th	„ 14	September 2	Semi-confluent	„	23	„	2	Faint	½ „	
358	T. F.	M.	22	3rd	3rd	„ 29	„ 10	Confluent	Died	13	—	—	—	—	
359	A. A.	M.	22	4th	8th	„ 31	„ 13	Discrete	Recovered	14	Infancy	4	Fair		
360	J. G.	M.	29	7th	9th	„ 30	„ 13	„	„	15	„	3	Good	¾ inch	
361	F. W.	F.	9	3rd	4th	„ 14	August 23	Mild	„	10	„	2	Fair	½ „	
362	E. D.	F.	23	4th	6th	„ 13	„ 30	Discrete	„	18	„	3	1 good and 2 fair	2 „	
363	M. B.	F.	24	3rd	5th	„ 1	„ 26	„	„	26	„	2	Fair	½ „	

BRADFORD

APPENDIX VII.—*continued.*

No.	Name.	Sex.	Age.	Day of Rash.	Day of Disease on Admission.	Date of Admission to Hospital.	Date of Discharge.	Type.	Result.	Days in Hospital.	Vaccination Marks.				Remarks.
											Date.	No.	Character.	Area.	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
						1893.	1893.								
364	H. B.	F.	27	4th	7th	August 1	August 26	Discrete	Recovered	26	Infancy	2	Good	¼ inch	
365	M. E. K.	F.	32	1st	3rd	„ 7	„ 23	„	„	15	„	2	„	½ „	
366	A. G.	F.	25	6th	6th	„ 14	September 6	„	„	24	„	3	Very good	1 „	
367	F. F.	M.	6 months.			„ 18	„ 2	Mild	„	16	Recent	4	Vesicles		"Under" vaccination; about 7 days
368	S. B.	F.	44	3rd	5th	„ 8	„ 2	Discrete	„	26	Infancy	2	Fair	½ „	
369	A. N.	F.	27	5th	8th	„ 15	„ 2	„	„	19	„	3	Good	¼ „	
370	M. A. G.	F.	27	5th	8th	„ 17	„ 2	Mild	„	17	„	3	Very good	1½ „	
371	W. H.	M.	30	5th	7th	„ 28	„ 12	Discrete	„	16	„	2	Good	½ „	
372	E. B.	F.	23	4th	4th	„ 26	„ 9	Mild	„	15	„	3	Fair	¼ „	
373	M. E. B.	F.	11	3rd	5th	„ 24	„ 9	Discrete	„	17	„	1	Very good	½ „	
374	M. W.	F.	47	3rd	5th	„ 17	„ 9	Semi-confluent	„	24	„	4	Fair	1 „	
375	E. R.	F.	17	3rd	7th	„ 28	„ 13	Discrete	„	17	„	3	„	1 „	
376	H. A. S.	F.	50	3rd	6th	„ 30	„ 13	„	„	15	„	2	Good	1½ „	
377	C. C.	F.	36	3rd	4th	„ 3	„ 13	Semi-confluent	„	42	„	1	Faint	½ „	
378	C. N.	F.	20	6th	7th	„ 29	„ 13	Mild	„	16	„	3	Good	1 „	
379	E. W.	F.	13			„ 28	„ 13	Discrete	„	17	„	4	„	¼ „	
380	A. K.	F.	20	3rd	4th	„ 5	„ 9	„		36	—	—	—	—	Unvaccinated.
381	R. R.	M.	17			„ 29	„ 9	Mild	„	12	Infancy	4	Good	1 inch	
382	M. C.	F.	69	3rd	7th	„ 27	„ 9	Discrete	„	14	„	2	Fair	½ „	From Union Workhouse.
383	J. W.	F.	38	4th	7th	„ 30	„ 9	„	„	11	„	1	„	½ „	
384	F. F.	M.	36	2nd	4th	„ 18	„ 6	„	„	20	„	2	Very faint	½ „	
385	G. R.	M.	29	3rd	5th	„ 7	„ 2	„	„	27	„	2	Faint	½ „	
386	A. J. D.	F.	4 weeks.			„ 24	August 26	Confluent	Died	3	—	—	—	—	Unvaccinated.
387	J. F. P.	M.	31	4th	5th	„ 14	September 9	Discrete	Recovered	27	Infancy	1	Good	¼ inch	
388	L. M.	F.	21	2nd	3rd	„ 30	„ 16	„	„	18	„	1	Very good	¾ „	
389	S. A. H.	F.	41	3rd	4th	„ 31	„ 16	„	„	17	„	3	Very faint	¾ „	
390	E. B.	F.	26	4th	7th	„ 28	„ 16	„	„	20	„	4	Very good	1 „	
391	M. D.	F.	46	4th	4th	„ 31	„ 13	„	„	14	„	2	1 fair and 1 small		
392	A. J.	F.	31	1st	3rd	„ 31	„ 13	„	„	14	„	2		¼ „	
393	F. B.	M.	28	3rd	9th	„ 28	„ 13	„	„	17	„	3	Very good	1 „	
394	M. I.	F.	29	3rd	6th	„ 30	„ 7	Confluent	Died	9	„	1	Fair		

No.	Name.	Sex.	Age.	Day of Rash.	Day of Disease on Admission.	Date of Admission to Hospital.	Date of Discharge.	Type.	Result.	Days in Hospital.	Vaccination Marks.				Remarks.
											Date.	No.	Character.	Area.	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
						1893.	1893.								
395	A. A. J.	F.	37	4th	6th	August 18	August 29	Confluent	Died	12	Infancy	1	Very good	½ inch	
396	S. B.	F.	59	3rd	5th	„ 3	September 13	Semi-confluent	„	42	?	?			Vaccination doubtful.
397	E. W.	F.	70	2nd	4th	„ 6	August 23	Discrete	Recovered	18	Infancy	1	Very faint	½ „	
398	M. P.	F.	18	3rd	5th	„ 15	September 30	Semi-confluent	„	47	—	0	—	—	Said to have been vaccinated; no marks.
399	A. W.	M.	46	2nd	6th	„ 20	„ 23	Discrete	„	35	Infancy	1	Fair	½ inch	
400	T. B.	M.	34	3rd	5th	„ 18	„ 23	Confluent	„	37	„	1	Faint	½ „	
401	A. L.	M.	42	8th	11th	„ 31	„ 20	Discrete	„	21	„	1	Small		
402	L. F.	F.	2			„ 7	„ 27	Semi-confluent	„	52	—	—	—	—	Unvaccinated.
403	E. C.	F.	23	3rd	5th	„ 24	„ 23	Confluent	„	31	Infancy	2	Good	½ inch	
404	J. G.	M.	30	3rd	5th	„ 24	„ 27	Discrete	„	35	„	2	Fair	½ „	
405	J. W. A.	M.	34	5th	5th	„ 14	„ 30	Confluent	„	48	„	2	„	½ „	
406	F. F.	M.	38	3rd	3rd	„ 8	„ 20	Semi-confluent	„	44	„	2	1 fair and 1 faint	½ „	
407	M. E. K.	F.	25	4th	5th	„ 7	„ 20	„	„	45	—	—	—	—	Unvaccinated.
408	C. W.	F.	24	3rd	4th	„ 28	October 4	„	„	38	Infancy	3	Fair	½ inch	
409	A. R.	F.	22		5th ?	„ 5	September 30	Confluent	„	57	—	—	—	—	Unvaccinated.
410	R. A.	F.	40	4th	5th	„ 29	„ 27	Discrete	„	30	Infancy	2	Fair	½ inch	
411	M. P.	F.	62	3rd	6th	„ 26	„ 27	„	„	33	„	1	Faint	½ „	
412	J. C.	M.	25	5th	8th	„ 30	„ 26	„	„	28	„	2	Good	½ „	
413	A. K.	F.	22	4th	5th	„ 26	October 7	„	„	43	—	—	—	—	Unvaccinated.
414	S. C.	M.	16	2nd	4th	„ 12	September 30	Confluent	„	50	Recent				"Under" vaccination, 12th day.
415	P. B.	M.	22	2nd	5th	September 2	„ 10	„	Died	9	Infancy	1	Very faint		
416	N. H.	M.	18	3rd	3rd	„ 3	„ 16	Mild	Recovered	14	„	3	Very good		
417	W. B.	M.	42			„ 5	„ 17	Confluent	Died	13	—	—	—	—	Unvaccinated.
418	A. W. R.	M.	26	5th	7th	„ 9	„ 16	Mild	Recovered	8	Infancy	1	Good	½ inch	
419	H. B.	F.	26	6th	7th	„ 28	October 11	„	„	14	„	3	„	¾ „	
420	E. T.	M.	26	3rd	7th	„ 23	„ 11	„	„	14	„	2	Very good	1 „	
421	E. K.	F.	10		4th	„ 26	„ 11	Discrete	„	16	„	2	Good	¾ „	
422	J. T.	M.	38	3rd	4th	„ 26	„ 11	Confluent	Died	16	„	2	Faint	½ „	
423	J. S.	M.	44	3rd	5th	„ 6	September 26	Discrete	Recovered	21	„	2	„		
424	J. E. P.	M.	24	4th	7th	„ 2	„ 23	„	„	22	„	2	Very faint		
425	J. O.	M.	37	2nd	6th	„ 2	„ 20	„	„	19	„	4	Fair		

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APPENDIX VII.—*continued.*

No.	Name.	Sex.	Age.	Day of Rash.	Day of Disease on Admission.	Date of Admission to Hospital.	Date of Discharge.	Type.	Result.	Days in Hospital.	Vaccination Marks.				Remarks.
											Date.	No.	Character.	Area.	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
425	G. S.	M.	34	2nd	6th	1893. September 2	1893. September 20	Discrete	Recovered	19	Infancy	2	1 good and 1 fair		
427	H. B. S.	F.	21	2nd	2nd	„ 26	October 3	Hæmorrhagic	Died	8	—	—	—	—	Unvaccinated.
428	L. F.	M.	29	3rd	3rd	„ 25	„ 2	Confluent	„	7	—	—	—	—	„
429	J. H.	M.	24	3rd	4th	„ 3	September 27	„	Recovered	25	Infancy	2	Fair	¼ inch	
430	A. W.	M.	4	2nd	5th	„ 4	„ 24	„	Died	21	—	—	—	—	„
431	A. C.	F.	16 months.			„ 29	October 5	Semi-confluent	„	7	—	—	—	—	
432	N. W.	F.	5			„ 30	„ 9	„	„	10	—	—	—	—	„
433	J. B.	M.	22	3rd	6th	„ 27	„ 7	Discrete	Recovered	11	Infancy	3	Good	1½ inch	
434	J. H.	M.	18	3rd	6th	„ 27	„ 7	„	„	11	„	2	Large, good		
435	F. M.	M.	19	7th	8th	„ 26	„ 7	Mild	„	12	„	2	Good	¾ „	
436	D. C.	M.	15	4th	6th	„ 27	„ 7	Discrete	„	11	„	1	Very good	½ „	
437	W. F.	M.	24	4th	5th	„ 27	„ 7	Mild	„	11	„	3	Fair	½ „	
438	S. J. B.	F.	40	2nd	3rd	„ 30	„ 7	Confluent	Died	8	?	0			Stated to have been vaccinated; no marks.
439	C. B.	M.	31	4th	6th	„ 26	„ 11	Discrete	Recovered	16	Infancy	2	Good	1 inch	
440	J. H.	M.	23	5th	7th	„ 29	„ 11	„	„	13	„	3	Very good	2 „	
441	S. W.	F.	19	3rd	6th	„ 28	„ 11	Mild	„		„	1	Good	½ „	
442	L. S.	F.	22			October 2	„ 3	„	„		„	2	„	¾ „	Admitted at Scholemoor, September 25; transferred October 2.
443	W. N.	M.	48			„ 2	„ 7	Semi-confluent	„		„	1	Poor	½ „	Admitted at Scholemoor, September 9; transferred October 2.
444	J. W. S.	M.	31			„ 2	„ 7	Discrete	„		„	3	Good	¾ „	Admitted at Scholemoor, ?; transferred October 2.
445	P. K.	M.	53			„ 2	„ 7	„	„		„	2	Fair	½ „	Admitted at Scholemoor, ?; transferred October 2.
446	A. E. P.	F.	25			„ 2	„ 11	„	„		„	2	„	? „	Admitted at Scholemoor, September 25; transferred October 2.
447	A. T.	F.	36			„ 2	„ 11	„	„		„	3	„	½ „	Admitted at Scholemoor, September 23; transferred October 2.
448	J. H.	M.	19			„ 2	„ 7	„	„		„	1	„	½ „	Admitted at Scholemoor, September 23; transferred October 2
449	D. I.	M.	21			„ 2	„ 11	„	„		„	3	Good	1 „	Admitted at Scholemoor, September 25; transferred October 2.
450	A. B.	M.	14			„ 2	„ 11	„	„		„	1	Fair	½ „	Admitted at Scholemoor, September 22; transferred October 2.
451	C. W. B.	M.	23			„ 2	„ 11	„	„		„	3	Very good	1½ inch	Admitted Scholemoor, September 21; transferred October 2.
452	A. H.	M.	3 weeks.			„ 3	„ 7	Semi-confluent	Died	5	—	—	—	—	Unvaccinated.
453	A. G.	F.	7 months.			„ 2	„ 4	Confluent	„		—	—	—	—	Admitted Scholemoor, September 14; transferred Oct. 2. Unvaccinated.
454	C. S.	F.	10			„ 2	„ 6	„	„		—	—	—	—	Admitted Scholemoor, September 21; transferred Oct. 2. Unvaccinated.
455	A. L.	F.	18 months.			„ 3	„ 5	Hæmorrhagic	„	3	—	—	—	—	Unvaccinated.
456	E. B.	F.	48			„ 2	„ 11	Discrete	Recovered		?				Admitted Scholemoor, September 12; transferred October 2.

No.	Name.	Sex.	Age.	Day of Rash.	Day of Disease on Admission.	Date of Admission to Hospital.	Date of Discharge.	Type.	Result.	Days in Hospital.	Vaccination Marks.				Remarks.
											Date.	No.	Character.	Area.	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
457	S. T.	M.	32			1893. October 2	1893. October 3	Discrete	Recovered		Infancy	4	Good	¾ inch	Admitted Scholemoor, September 11; transferred October 2.
458	A. K.	M.	24	4th	7th	August 5	August 19	Mild	"	15	"	1	Fair	¼ inch	
459	A. F.	F.	35		6th	" 3	" 19	"	"	16	"	1	Good	½ "	
460	M. E.	F.	16		5th	" 4	" 19	"	"	16	"	3	Very good	2 "	
461	A. B.	F.	27			" 9	" 19	"	"	11	"	3	"	2 "	
462	W. C.	M.	12			" 8	" 17	Confluent	Died	10	—	—	—	—	Unvaccinated.
463	J. D.	M.	4			" 8	" 13	"	"	6	—	—	—	—	"
464	E. F.	F.	4 months.			" 7	" 15	"	"	9	—	—	—	—	"
465	E. L.	F.	69			" 11	" 18	"	"	8	Infancy	2	Fair	½ inch	
466	T. C.	M.	32	4th	5th	" 29	October 11	"	Recovered	44	—	—	—	—	"
467	M. T.	F.	15			September 2	September 23	Mild	"	12	Infancy	4	Good		
468	J. H.	F.	53	3rd	4th	" 5	" 13	Discrete	"	9	"	2	1 fair and 1 faint		
469	A. H.	F.	26	4th	5th	July 28	October 14	Semi-confluent	"	79	—	—	—	—	Unvaccinated. (2 unsuccessful attempts in infancy.)
470	R. D.	M.	48	2nd	3rd	August 5	November 18	Confluent	"	106	Infancy	1	Very bad	½ inch	Same house as No. 422.
471	P. W.	F.	17	3rd	5th	" 28	" 18	Discrete	"	83	—	—	—	—	Unvaccinated.
472	C. W.	F.	15	3rd	5th	" 26	October 14	Semi-confluent	"	50	—	—	—	—	"
473	G. H.	M.	3			September 28	November 4	Discrete	"	38	—	—	—	—	"
474	E. H.	M.	40	5th	7th	" 27	" 15	Semi-confluent	"	85	Infancy	1	Fair	½ inch	Re-vaccinated 12 years ago; 2 small faint scars.
475	J. L.	M.	32			October 2	" 13	Discrete	"		"	3	"	½ "	Transferred from Scholemoor.
476	A. S.	M.	18	3rd	5th	September 26	" 18	Confluent	"	54	"	3	Very good	1 "	Described as "Confluent" (modified).
477	J. W. B.	M.	29	2nd	4th	" 27	" 4	"	"	39	"	1	Fair	½ "	" " "
478	H. M. J.	F.	48	3rd	6th	" 27	" 4	Semi-confluent	"	39	"	2	Bad	½ "	
479	S. S.	F.	41	3rd	5th	" 28	" 4	"	"	38	"	2	Fair	½ "	
480	W. B.	M.	14			October 2	" 8	"			—	—	—	—	Transferred from Scholemoor. Unvaccinated.
481	S. E. B.	F.	17	2nd	2nd	September 28	" 1	Confluent	"	35	Infancy	3	Good	¾ inch	
482	M. K.	F.	15	4th	4th	" 27	" 1	Discrete	"	36	—	—	—	—	Unvaccinated.
483	J. W. T.	M.	30	3rd	5th	" 29	October 28	"	"	30	Infancy	3	Fair	½ inch	
484	W. W.	M.	3			" 26	" 18	"	"	23	—	—	—	—	
485	J. J.	M.	25	3rd	4th	" 27	November 1	Semi-confluent	"	36	Infancy	3	Very good	1 inch	
486	J. W. V.	M.	48	4th	5th	" 26	October 28	Discrete	"	33	"	2	1 fair and 1 faint	½ "	
487	F. H.	F.	21	2nd	3rd	" 30	" 21	"	"	22	"	2	Faint	½ "	

BRADFORD

APPENDIX VII.—*continued.*

No.	Name.	Sex.	Age.	Day of Rash.	Day of Disease on Admission.	Date of Admission to Hospital.	Date of Discharge.	Type.	Result.	Days in Hospital.	Vaccination Marks.				Remarks.
											Date.	No.	Character.	Area.	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
488	H. J.	M.	39	4th	6th	1893. September 29	1893. October 21	Discrete	Recovered	23	Infancy	2	Fair	½ inch	
489	W. C.	M.	59	5th	7th	„ 29	„ 14	„	„	16	„	3	„	½ „	
490	J. B.	M.	32	4th	6th	„ 29	„ 14	„	„	16	„	2	Very faint	½ „	
491	J. T. W.	M.	21	3rd	7th	„ 28	„ 14	„	„	17	„	3	Good	½ „	
492	M. A. K.	F.	25	3rd	5th	„ 30	„ 14	„	„	15	„	3	„	½ „	
493	J. B.	M.	31			„ 27	„ 14	„	„	18	„	2	„	½ „	
494	F. K.	M.	18	5th	6th	October 18	November 18	„	„	32	„	3	Fair	½ „	
495	W. H. F.	M.	31	4th	4th	„ 19	„ 15	„	„	28	„	3	Faint	½ „	
496	S. P.	M.	28	3rd	6th	„ 30	„ 15	„	„	17	„	3	2 good and 1 faint	½ „	Re-vaccinated (unsuccessfully) October 17th and 28th.
497	J. I. T.	M.	11			„ 2	„ 8	Confluent	—		—	—	—	—	Transferred from Scholemoor: unvaccinated.
498	W. A. R.	F.	33		7th	„ 11	„ 15	Discrete	„	36	Infancy	3	Fair	½ inch	
499	J. B.	M.	9			„ 2	„ 11	Semi-confluent	„	41	—	—	—	—	Unvaccinated.
500	A. T.	M.	43	2nd	4th	„ 17	„ 11	Discrete	„	24	Infancy	4	Fair	½ inch	Exposed to infection at Scholemoor October 2nd.
501	J. F.	M.	22	5th	7th	„ 26	„ 11	„	„	17	„	2	1 fair and 1 faint	½ „	Re-vaccinated (unsuccessfully) October 24th.
502	J. W. C.	M.	42	5th	6th	„ 2	„ 15	Semi-confluent	„	45	„	1	Poor	½ „	
503	W. F.	M.	21	4th	5th	„ 16	„ 15	Discrete	„	31	„	1	Very good	2 „	
504	E. C.	F.	28	4th	7th	„ 25	„ 11	„	„	18	„	2	Fair	½ „	
505	S. E.	F.	13	4th	6th	„ 23	„ 11	„	„	20	„	3	„	½ „	Re-vaccinated (successfully) October 18th.
506	M. L.	M.	30	5th	6th	„ 15	„ 13	„	„	30	„	4	Good	½ „	Sent from Ilkley.
507	T. Q.	M.	36	3rd	10th	„ 16	„ 8	„	„	24	„	2	1 good and 1 faint	½ „	
508	J. H. A.	M.	34	3rd	5th	„ 18	„ 4	„	„	18	„	1	Faint and very small.		
509	H. M. M.	F.	24	3rd	4th	„ 22	„ 4	Mild	„	18	„	3	Very good	1½ „	
510	J. D.	F.	25			„ 2	„ 8	Semi-confluent	„	38	„	2	Good	½ „	Transferred from Scholemoor.
511	T. C.	M.	5			„ 30	„ 4	Confluent	Died	6	October 20, 1893.	3	Vesicles		"Under" vaccination.
512	E. W.	F.	26	4th	7th	„ 16	„ 4	Discrete	Recovered	20	Infancy	3	Fair	½ inch	
513	L. A. B.	M.	31	4th	7th	„ 20	„ 4	Mild	„	16	„	2	Very faint	½ „	
514	H. H.	M.	22	3rd	9th	„ 16	„ 4	Discrete	„	20	„	3	Very good	1½ „	
515	F. B.	M.	30	3rd	6th	„ 17	„ 4	Mild	„	19	„	4	Good	½ „	
516	C. P.	M.	40	4th	7th	„ 16	„ 4	Discrete	„	20	„	1	Faint	½ „	
517	V. B.	F.	10			„ 3	„ 18	Semi-confluent	„	47	—	—	—	—	Unvaccinated. Same house as 499.
518	M. A. A.	F.	33	5th	6th	„ 15	„ 18	„	„	35	Infancy	3	Good	½ inch	

APPENDIX VII.—*continued.*

No.	Name.	Sex.	Age.	Day of Rash.	Day of Disease on Admission.	Date of Admission to Hospital.	Date of Discharge.	Type.	Result.	Days in Hospital.	Vaccination Marks.				Remarks.
											Date.	No.	Character.	Area.	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
519	A. S.	F.	17			1893. October 2	1893. November 18	Confluent	Recovered	—	—	—	—	—	Unvaccinated. Transferred from Scholemoor.
520	E. M.	F.	17	3rd	4th	„ 30	„ 18	Discrete	„	20	Infancy	3	Good	¼ inch	Re-vaccinated (unsuccessfully) Oct. 29
521	S. A. S.	F.	22	4th	7th	„ 30	„ 16	„	„	17	„	1	Faint	½ „	Re-vaccinated (3 vesicles) Oct. 25.
522	S. T.	M.	38	3rd	6th	„ 13	„ 18	„	„	37	„	4	„	¼ „	
523	S. C.	F.	23	3rd	5th	„ 26	„ 11	„	„	17	„	1	Fair	½ „	
524	R. R.	F.	21	3rd	4th	„ 11	„ 11	„	„	32	„	2	Good	¼ „	
525	F. R.	M.	37	3rd	6th	„ 19	„ 11	Mild	„	24	„	1	Faint	½ „	
526	S. C.	M.	36	4th	6th	„ 18	„ 11	Discrete	„	25	„	2	Good	¼ „	Fireman engaged at Scholemoor fire, October 2.
527	C. G.	M.	29	3rd	4th	„ 19	„ 11	„	„	24	„	2	„	¼ „	
528	E. A. H.	F.	38	3rd	5th	„ 23	„ 2	Confluent	Died	11	„	3	Faint	¼ „	Re-vaccinated (3 vesicles) October 17.
529	M. H. I.	F.	10	5th	6th	„ 19	„ 4	Mild	Recovered	17	„	4	Very faint	¼ „	
530	C. E. L.	M.	37	6th	9th	„ 25	„ 8	Discrete	„	15	„	2	Good	¼ „	
531	E. P.	F.	49	4th	5th	„ 18	„ 4	Mild	„	18	„	4	Fair	¼	
532	W. B.	M.	23	4th	8th	„ 23	„ 11	Discrete	„	20	„	3	Very good	¼ „	
533	J. B.	M.	82	3rd	4th	„ 15	„ 11	„	„	28	„	2	Good	1 „	Sent from Infirmary.
534	S. D.	M.	23	4th	7th	„ 17	„ 11	„	„	26	„	2	1 fair and 1 faint	¼ „	
535	W. L.	M.	18	3rd	4th	„ 18	„ 11	Mild	„	25	„	2	Good	¼ „	
536	C. A.	M.	29	4th	4th	„ 23	„ 8	Discrete	„	17	„	2	Fair	¼ „	
537	A. H.	M.	38			„ 2	„ 8	Confluent	„		„	2	„	¼ „	Transferred from Scholemoor.
538	M. T.	M.	35	5th	8th	„ 24	„ 8	Discrete	„	16	„	3	Very good	¼ „	Engaged in driving patients from Scholemoor to Leeds Road on Oct 2.
539	T. S.	M.	84			„ 2	„ 8	„	„	38	„	1	Fair	½ „	
540	F. B.	M.	31	4th	5th	„ 15	„ 4	„	„	21	„	2	„	¼ „	
541	C. E. C.	M.	24	4th	8th	„ 16	„ 4	„	„	20	„	2	„	¼ „	
542	E. F.	M.	34	3rd		„ 9	„ 4	Mild	„	27	„	2	Good	¼ „	Admitted in error from same house as 492. Re-vaccinated October 11th (successfully). Developed small-pox in hospital October 20th.
543	H. S.	M.	24	4th	5th	„ 17	„ 4	Discrete	„	19	„	2	Fair	¼ „	Same house as 521.
544	R. T.	M.	22	4th	5th	„ 25	„ 11	„	„	18	„	3	Good	¼ „	
545	A. B.	M.	50	3rd	4th	„ 14	„ 11	„	„	29	„	1	Fair	½ „	
546	G. I.	M.	27	3rd	4th	„ 13	„ 11	„	„	30	?	0	—	—	Thinks he has been vaccinated—no marks.
547	J. P.	M.	2 months.			„ 27	„ 18	„	„	23	October 16, 1893.	2	Large vesicles	—	"Under" vaccination.

BRADFORD.

APPENDIX VII.—*continued.*

No.	Name.	Sex.	Age.	Day of Rash.	Day of Disease on Admission.	Date of Admission to Hospital.	Date of Discharge.	Type.	Result.	Days in Hospital.	Vaccination Marks.				Remarks.
											Date.	No.	Character.	Area.	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
548	M. H.	F.	12	4th	4th	1893. October 17	1893. November 18	Semi-confluent	Recovered	43	September 25, 1893.	2	Recent vesicles		"Under" vaccination.
549	R. L.	F.	23	4th	4th	„ 10	„ 13	Mild	„	55	Infancy	1	Fair	¼ inch	
550	A. S.	F.	51	7th	8th	„ 12	„ 13	Discrete	„	28	„	2	„	¼ „	
551	W. G.	M.	32	6th	7th	„ 3	„ 15	„	„	44	„	2	„	¼ „	
552	S. A. T.	F.	23	3rd	5th	„ 17	„ 18	„	„	33	?	0			Said to have been vaccinated; no marks.
553	A. E. O.	F.	26	2nd	4th	„ 15	„ 11	Semi-confluent	„	28	Infancy	3	Fair	¼ inch	
554	E. S.	F.	62	5th	7th	„ 26	„ 11	Mild	„	17	„	2	Poor	¼ „	
555	E. G.	F.	63	5th	5th	„ 16	„ 18	Discrete	„	34	„	1	Very faint	¼ „	
556	E. H.	F.	28	4th	8th	„ 16	„ 18	Semi-confluent	„	34	„	1	Faint	¼ „	
557	J. F.	M.	49	5th	5th	„ 4	„ 18	Discrete	„	47	„	2	„	¼ „	
558	M. B.	F.	24	2nd	7th	„ 22	„ 8	„	„	18	„	1	Good	¼ „	
559	M. E. V.	F.	31	4th	7th	„ 16	„ 4	„	„	20	„	2	Poor	¼ „	
560	E. S.	F.	32			„ 18	„ 4	„	„	18	„	2	Faint	¼ „	
561	M. E. W.	F.	17	3rd	6th	„ 17	„ 4	„	„	19	„	3	Very good	2 „	
562	M. H.	F.	20	3rd	4th	„ 16	„ 4	„	„	20	„	4	Faint	¼ „	
563	E. K.	F.	24	5th	6th	„ 18	„ 8	Mild	„	22	„	3	„	¼ „	
564	A. W.	F.	36	1st	7th	„ 18	„ 8	Discrete	„	17	„	2	1 fair and 1 faint.	¼ „	
565	A. P.	F.	28	4th	5th	„ 16	„ 18	Semi-confluent	„	34	„	4	Good	1 „	Same house as 547.
566	M. W.	F.	18	3rd	3rd	„ 30	„ 15	Mild	„	17	„	3	Faint	¼ „	Re-vaccinated (unsuccessfully) October 31.
567	J. P.	F.	53	3rd	4th	„ 7	„ 4	Discrete	„	29	?	0			Said to have been vaccinated; no marks.
568	M. E. F.	F.	20	4th	5th	„ 17	„ 4	„	„	19	Infancy	4	Good	¼ inch	
569	A. C.	F.	21	3rd	4th	„ 16	„ 4	„	„	20	„	3	Very good	1½ „	
570	A. F.	M.	20			„ 2	„ 8	Confluent	„		„	1	Fair	¼ „	Transferred from Scholemoor.
571	E. R.	M.	40			„ 24	„ 8	Discrete	„	16	„	2	„	¼ „	Re-vaccinated at 14 years; ¼ inch square.
572	J. W.	M.	29	4th	6th	„ 21	„ 8	„	„	18	„	2	„	¼ „	
573	A. E.	F.	41	3rd	5th	„ 18	„ 8	Mild	„	22	„	1	Faint	Very small	
574	E. P.	F.	15	3rd	3rd	„ 11	„ 8	„	„	29	„	1	Fair	½ inch	
575	A. K.	F.	19	5th	7th	„ 20	„ 8	„	„	20	„	3	Good	¼ „	
576	C. E. J.	M.	29			„ 2	October 28	Discrete	„	27	„	2	Very good	¼ „	Transferred from Scholemoor.
577	E. A.	M.	23	4th	7th	„ 16	November 1	Mild	„	17	„	2	„	1 „	
578	M. A.	F.	23	4th	7th	„ 16	„ 1	„	„	17	„	2	Fair	¼ „	Same house as 576.

APPENDIX VII.—*continued.*

No.	Name.	Sex.	Age.	Day of Rash.	Day of Disease on Admission.	Date of Admission to Hospital.	Date of Discharge.	Type.	Result.	Days in Hospital.	Vaccination Marks.				Remarks.
											Date.	No.	Character.	Area.	
1.	2.	3.	4.	5.	5.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
579	E. T.	F.	25	3rd	4th	1893. October 16	1893. November 1	Discrete	Recovered	17	Infancy	3	Very faint	½ inch	
580	A. W.	F.	50	5th	5th	„ 17	„ 1	„	„	15	„	1	„	¼ „	
581	L. R.	F.	37	4th	10th	„ 9	October 28	„	„	20	„	3	Good	¼ „	Same house as 525.
582	F. B.	F.	23	6th	7th	„ 9	„ 28	Mild	„	20	„	3	„	¼ „	
583	B. P.	F.	13	5th	8th	„ 13	„ 28	Discrete	„	16	„	2	Faint	½ „	
584	F. J.	F.	36	2nd	3rd	„ 1	„ 28	Semi-confluent	„	28	„	2	1 fair and 1 faint	? „	
585	A. E. T.	F.	2			„ 9	„ 28	Mild	„	17	—	—	—	—	Unvaccinated (attempt failed in infancy).
586	A. M.	M.	33	4th	6th	„ 17	November 1	Discrete	„	16	Infancy	3	Fair	¼ „	
587	F. E.	M.	21	4th	6th	„ 13	„ 1	„	„	20	„	4	Very good	1½ „	
588	A. A. H.	M.	23	1st	5th	„ 17	„ 1	Mild	„	16	„	3	„	¼ „	
589	J. W.	M.	12			„ 12	„ 1	Discrete	„	21	„	2	Fair	¼ „	
590	W. M.	M.	19	4th	5th	„ 15	„ 1	„	„	18	„	1	„	¼ „	Exposed to infection at Scholemoor, October 2.
591	G. W. B.	M.	37			„ 2	„ 1	Confluent	„	31	„	3	„	¼ „	Transferred from Scholemoor.
592	J. H.	M.	35	3rd	5th	„ 12	„ 1	Discrete	„	31	„	3	Good	¼	
593	J. R.	M.	26	4th	6th	„ 9	„ 1	Semi-confluent	„	24	„	4	„	1 „	
594	A. J.	F.	17	3rd	4th	„ 14	October 28	Mild	„	15	„	3	Very good	1½	
595	R. R.	F.	17	4th	5th	„ 14	„ 28	„	„	15	„	3	Fair	1	
596	L. L.	F.	21	2nd	3rd	„ 12	„ 23	Confluent	Died	12	„	1	Faint	'	
597	J. B.	M.	27	4th	6th	„ 12	November 1	Discrete	Recovered	21	„	2	Good	¼	
598	H. J.	F.	18	4th	8th	„ 13	„ 1	Mild	„	20	„	4	Fair	1½	
599	S. L.	M.	50	5th	6th	„ 18	„ 1	„	„	15	„	2	1 fair and 1 faint	¼ „	
600	M. A. H.	F.	14	3rd	4th	„ 16	October 27	Confluent	Died	12	?	0			Said to have been vaccinated; no marks.
601	H. B.	F.	50	2nd	3rd	„ 16	„ 25	„	„	10	„	2	Faint	½ „	
602	C. H.	M.	37	3rd	5th	„ 17	„ 24	„	„	8	„	2	1 fair and 1 faint	¼ „	
603	S. S.	F.	21	2nd	4th	„ 12	„ 23	„	„	12	—	—	—	—	Unvaccinated.
604	E. W.	F.	17			„ 7	„ 21	Discrete	Recovered	15	Infancy	3	Good	¼ inch	
605	J. R. J.	M.	40	4th	4th	„ 19	„ 27	Confluent	„	9	„	3	Fair	¼ „	Exposed to infection at Scholemoor, October 2.
606	G. M. W.	F.	6 weeks.	2nd	6th	„ 12	„ 20	„	Died	9	—	—	—	—	Unvaccinated.
607	F. W.	F.	35			„ 12	„ 20	Mild	Recovered	9	Infancy	2	Fair	½ inch	Re-vaccinated (unsuccessfully) October 12.
608	H. C.	F.	33	3rd	5th	„ 12	„ 21	Hæmorrhagic	Died	10	„	2	Faint	¼ „	
609	E. F.	F.	9			„ 18	November 1	Mild	Recovered	15	„	4	Very good	1 „	

BRADFORD.

APPENDIX VII.—*continued.*

No.	Name.	Sex.	Age.	Day of Rash.	Day of Disease on Admission.	Date of Admission to Hospital.	Date of Discharge.	Type.	Result.	Days in Hospital.	Vaccination Marks.				Remarks.
											Date.	No.	Character.	Area.	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
						1893.	1893.								
610	E. H.	F.	26	3rd	5th	October 2	October 18	Discrete	Recovered	17	Infancy	3	Fair	¼ inch	
611	M. J.	F.	27	6th	7th	„ 16	November 1	„	„	17	„	3	„	¼ „	
612	M. C.	F.	17			„ 2	October 25	Confluent	„	—	„	2	Faint	¼ „	Transferred from Scholemoor.
613	A. R.	F.	28			„ 2	„ 25	„	„	—	—	—	—	—	„ „ Unvaccinated.
614	M. M.	F.	25			„ 2	„ 21	Discrete	„	—	Infancy	3	Fair	¼ inch	Transferred from Scholemoor.
615	P. T.	F.	18			„ 2	„ 21	„	„	—	„	3	Good	¾ „	„ „
616	S. B.	F.	14			July 31	„ 21	Confluent	„	83	—	—	—	—	Removed to Scholemoor, September 16.
617	S. E. T.	F.	17	4th	6th	October 3	„ 18	Discrete	„	16	Infancy	4	Good	1¼ inch	Transferred from Scholemoor, October 2. Unvaccinated.
618	E. L.	F.	45			„ 2	November 1	Semi-confluent	„	—	„	2	Faint	¼ „	Transferred from Scholemoor.
619	W. C.	M.	37			„ 2	October 16	„	„	—	„	2	Good	¼ „	„ „
620	J. F.	M.	14	3rd	3rd	„ 13	„ 28	Mild	„	16	„	4	„	1 „	Re-vaccinated (successfully) October 5. Same house as No. 608.
621	J. C.	M.	16	2nd	3rd	„ 9	„ 28	„	„	20	„	3	„	½ „	
622	K. B.	M.	46			„ 14	„ 28	„	„	15	„	1	Faint	¼ „	
623	M. C.	F.	35	5th	6th	„ 12	„ 19	Hæmorrhagic	Died	8	„	2	1 fair and 1 faint	½ „	
624	T. W.	M.	26	2nd	4th	„ 15	„ 23	Confluent	„	9	—	—	—	—	Unvaccinated.
625	M. W.	F.	18	4th	5th	„ 17	„ 23	„	„	7	Infancy	2	Faint	¼ inch	
626	J. S.	M.	34	2nd	5th	„ 16	„ 24	„	„	9	„	1	Fair	½ „	
627	M. G. H.	F.	17	2nd	2nd	„ 4	„ 24	Mild	Recovered	18	„	2	Faint	¼ „	
628	E. B.	F.	4			„ 2	„ 21	Discrete	„	—	—	—	—	—	Transferred from Scholemoor. Unvaccinated.
629	R. H.	M.	15	2nd	4th	„ 4	„ 21	Mild	„	18	Infancy	3	Fair	¾ inch	
630	L. I.	F.	5			„ 2	„ 25	Discrete	„	—	—	—	—	—	Transferred from Scholemoor. Unvaccinated.
631	A. F.	F.	29			„ 2	„ 25	„	„	—	Infancy	1	Good	½ inch	Transferred from Scholemoor.
632	E. H.	F.	4 months.			„ 2	„ 25	„	„	—	—	—	—	—	Transferred from Scholemoor. Unvaccinated.
633	— H.	F.	23			„ 2	„ 25	„	„	—	—	—	—	—	Transferred from Scholemoor. Unvaccinated; same house as No. 631.
634	L. I.	F.	11			„ 10	„ 28	„	„	19	Infancy	2	Fair	¼ inch	
635	A. W.	F.	14			„ 2	„ 28	Semi-confluent	„	—	—	—	—	—	Transferred from Scholemoor. Unvaccinated.
636	M. A. E.	F.	36			„ 9	„ 28	Mild	„	20	Infancy	2	Good	¼ inch	
637	M. T.	F.	24	5th	6th	„ 11	„ 28	Discrete	„	18	„	4	Faint	¼ „	
638	L. I.	F.	5			„ 2	November 1	„	„	—	—	—	—	—	Transferred from Scholemoor. Unvaccinated; same house as No. 629.
639	H. E.	M.	10			„ 9	„ 1	„	„	24	Infancy	4	Fair	¼ inch	
640	E. N.	F.	19			„ 2	„ 1	Semi-confluent	„	—	—	—	—	—	Transferred from Scholemoor. Unvaccinated.

APPENDIX VII.—*continued.*

No.	Name.	Sex.	Age.	Day of Rash.	Day of Disease on Admission.	Date of Admission to Hospital.	Date of Discharge.	Type.	Result.	Days in Hospital.	Vaccination Marks.				Remarks.
											Date.	No.	Character.	Area.	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
641	S. K.	F.	14			1893. October 2	1893. October 21	Confluent	Died	—	—	—	—	—	Transferred from Scholemoor. Unvaccinated.
642	S. T. K.	F.	41			„ 12	„ 16	„	„	5	Infancy	1	Fair	½ inch	Same house as 476.
643	S. R.	F.	53			„ 2	„ 14	Discrete	Recovered	13	„	3	2 good and 1 faint	¾ „	
644	M. J. T.	F.	27			2	„ 14	„	„	13	„	4	Fair	½ „	Re-vaccinated October 5 (1 very faint scar, ½).
645	G. G.	M.	49	5th	7th	November 1	November 18	„	„	18	„	2	Very faint	¼ „	
646	E. V.	M.	5			3	„ 18	Mild	„	16	Oct. 6, 1893	3	Crusts	½	
647	W. R.	M.	23	3rd	5th	„ 4	„ 18	Discrete	„	15	Infancy	2	Good	¾ „	
648	J. B.	M.	51	3rd	4th	„ 9	„ 17	Confluent	Died	9	„	1	Fair	½	
649	B. B.	M.	38			„ 8	„ 17	„	„	10	„	1	Faint	¼ „	
650	W. O.	M.	21	2nd	5th	„ 9	„ 17	„	„	9	—	—	—	—	Unvaccinated.
651	M. B.	M.	39	4th	5th	„ 6	„ 8	Hæmorrhagic	„	3	Infancy	3	Fair	½ inch	
652	J. I.	M.	54	2nd	3rd	„ 12	17	„	„	6	.	1	„	¾ „	
653	J. W.	M.	42	2nd	4th	„ 6	„ 13	Confluent	„	8	—	—	—	—	Unvaccinated.
654	A. C.	M	3			„ 6	„ 10	„	„	5	—	—	—	—	Unvaccinated.
655	M. B.	F.	45	4th	7th	„ 3	„ 18	Discrete	Recovered	16	Infancy	4	Fair	¾ inch	
656	B. W.	M.	32			„ 10	„ 14	Confluent	Died	5	?	0			Vaccination doubtful.
657	F. M.	M.	27	3rd	4th	„ 3	„ 18	Discrete	Recovered	16	Infancy	2	Good	½ inch	
658	A. R.	F.	50	4th	6th	„ 2	„ 9	Semi-confluent	Died	8	„	2	Very faint	¼ „	Heart disease.
	Not removed to Hospital.				Date of Notification.										
659	A. B. D.	F.	23		July 19			Confluent	Died						
660	J. H.	F.	39		Sept. 26			„	„						
661	W. A.	M.	49		„ 25			„	„						

BRADFORD.

APPENDIX VIII.

BRADFORD SMALL-POX, 1893.

NUMBER of INFECTED HOUSES per cent. of TOTAL NUMBER of HOUSES in ¼ mile zones and quadrants of ¼ mile zones.
[Communicated by Dr. A. E. Evans, Medical Officer of Health.]

——	¼.	½.	¾.	1.	
N.E.	8·0	17·9	4·4	1·9	
N.W.	7·8	3·5	1·3	1·6	
S.E.	13·2	7·7	3·5	2·1	
S.W.	11·9	4·5	1·9	0·64	
Total	10·4	6·5	2·1	1·3	Per-centage of infected houses in each quarter mile zone.

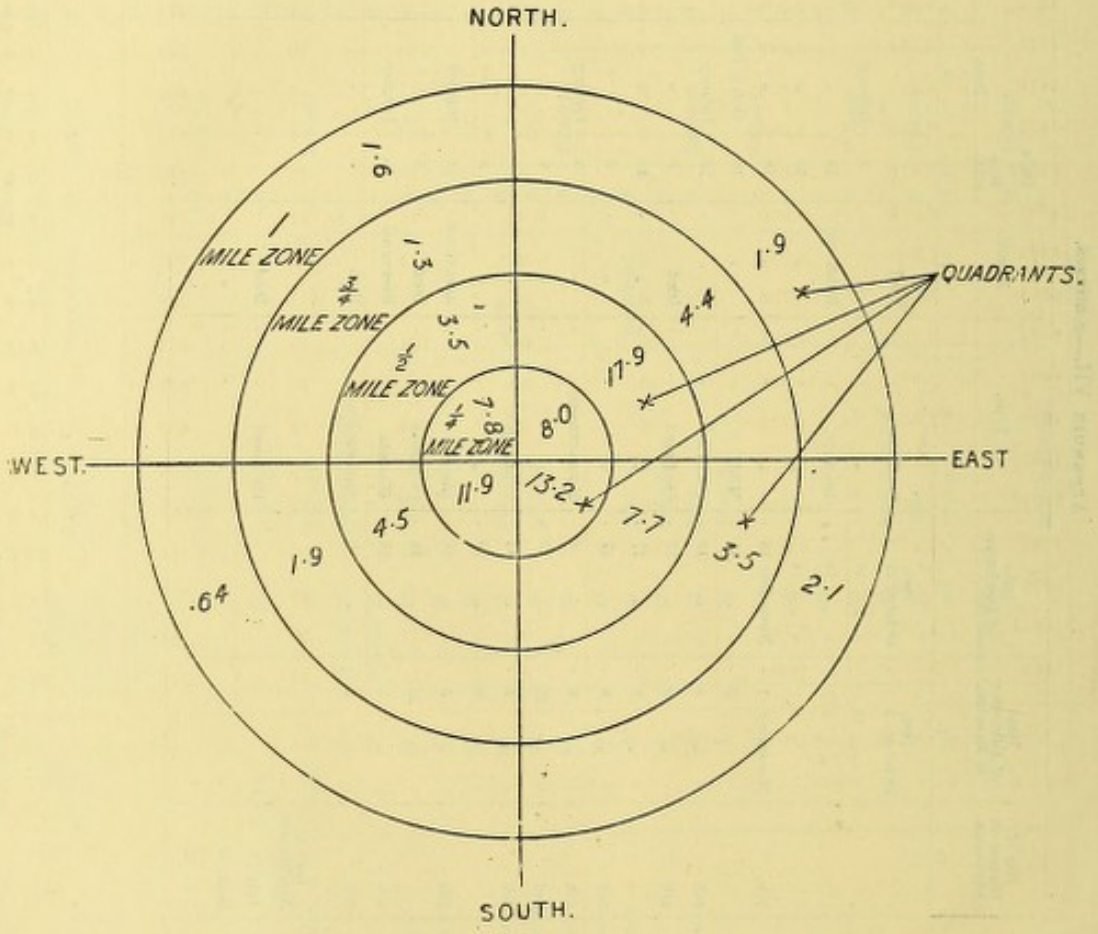

Diagram illustrating proportionate distribution of houses invaded by Small-pox in Bradford around the Hospital.
(Drawn by Dr. A. E. Evans.)

APPENDIX IX.

BRADFORD UNION.

VACCINATION RETURNS, 1872–1892.

Year.	Births registered during Year.	Of the Children whose Births were registered during the Year given in the First Column, by the 31st January in the Year next but one following that Year there were :—						
		Successfully Vaccinated.	Certified as Insusceptible of Vaccination.	Had Small-pox.	Died unvaccinated.	Vaccination postponed by Medical Certificate.	Remaining.	The Children not finally accounted for (including Cases postponed) being per cent. of Births.
1872	6,129	5,106	4	0	716	303		4·9
1873	6,267	5,154	3	0	829	1	280	4·5
1874	6,443	5,335	10	2	782	0	314	4·9
1875	6,456	5,279	3	0	818	4	352	5·5
1876	6,678	5,532	1	0	747	4	394	6·0
1877	6,794	5,529	2	1	724	10	528	7·9
1878	6,652	5,313	2	0	827	5	505	7·7
1879	6,246	5,082	3	0	682	4	475	7·7
1880	6,416	5,057	4	0	780	13	562	9·0
1881	6,073	4,920	2	0	693	11	447	7·5
1882	5,965	4,956	5	0	698	12	294	5·1
1883	5,604	4,738	6	0	586	11	263	4·9
1884	5,782	4,723	1	0	704	11	343	6·1
1885	5,891	4,829	10	0	635	21	396	7·1
1886	5,944	4,722	4	0	744	13	461	8·0
1887	5,852	4,493	2	0	743	10	604	10·5
1888	5,945	4,423	12	0	676	4	830	14·0
1889	5,910	3,859	12	0	821	19	1,199	20·6
1890	5,813	3,539	10	0	849	28	1,387	24·3
1891	5,840	3,149	9	0	871	30	1,781	31·0
1892	5,644	3,600	14	0	751	38	1,241	22·7

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VACCINATION COMMISSION.

APPENDIX IX.

TO THE

FINAL REPORT

OF THE

ROYAL COMMISSION ON VACCINATION.

PAPERS RELATING TO CASES IN WHICH DEATH OR NON-FATAL INJURY WAS ALLEGED OR SUGGESTED TO HAVE BEEN CAUSED BY, OR OTHERWISE CONNECTED WITH, VACCINATION.

Presented to both Houses of Parliament by Command of Her Majesty.



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APPENDIX IX.

As to cases in which death or non-fatal injury was alleged or suggested to have been caused by, or otherwise connected with, Vaccination.

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II.—Memorandum, prepared by Dr. Edward Ballard and forwarded to the Commission by the Local Government Board, on the two hundred and five cases in which death, occurring on or between the 1st November 1888 and the 30th November 1891, had been alleged or suggested to have been connected with Vaccination, and which had been reported on by Medical Inspectors of the Local Government Board - - - - - - 75

III.—Reports on inquiries, made on behalf of the Commission, into cases in which death or non-fatal injury had been alleged or suggested to have been caused by, or otherwise connected with, Vaccination; with other information as to certain cases, brought to the Commission's knowledge with a view to their investigation, into the circumstances of which inquiry was not made by medical men on behalf of the Commission* - - - - - - 211

*Note.—From the 1st June 1889 to the 1st July 1896, the Commission was from time to time informed from various sources of cases in which death or non-fatal injury had been alleged or suggested to have been caused by, or otherwise connected with, vaccination, with a view to their investigation; and, from the 14th February 1891, the Local Government Board immediately informed the Commission of all such cases brought to the Board's notice. In March 1892 the Home Office addressed a circular letter to Coroners throughout England and Wales requesting that, in all cases where they received information that the death of any person, on whose body they proposed to hold an inquest, had been alleged to have been caused by, or to have had any connexion with, vaccination, they would communicate immediately with the Commission.

From all sources 421 cases in which death or non-fatal injury had been alleged or suggested to have been connected with vaccination was brought to the Commission's notice, with a view to their investigation, from the 1st June 1889 to the 1st July 1896, exclusive of cases referred to by witnesses in evidence given before the Commission where such cases were not, otherwise than by the examination of witnesses, made the subject of inquiry by the Commission. These 421 cases, however, include 19 groups of connected cases, each such group being throughout this note counted as one case only. The cases were numbered in the order of the dates of the communications first informing the Commission of their occurrence; the 19 groups of connected cases being numbered each as one case, but distinguished by the word "Series" following the number. Among the 421 cases were 45, the subject of reports by Medical Inspectors of the Local Government Board included among the two hundred and five analysed for the Commission by Dr. Coupland and Dr. Acland.

Of the 421 cases, 262 were brought to the Commission's notice during the period from the 1st June 1889 to the 31st July 1893, and 159 during the period from the 1st August 1893 to the 1st July 1896.

(A.) Of the 262 cases brought to the Commission's notice during the period, of four years and two months, from the 1st June 1889 to the 31st July 1893:—

175 are the subject of reports, here given, by medical men appointed by the Commission to make inquiry into them. (In one of these 175 cases (Case 259), however, such report only states the inability of the reporter to obtain any material information.)

59 others are the subject of reports by Medical Inspectors of the Local Government Board. (The reports in 41 of these 59 cases are among the two hundred and five analysed by Dr. Coupland and Dr. Acland, and in the other 18 cases abstracts of them are here given.)

In 22 others the Commission obtained the information here given, and instituted no further inquiry.

And in the remaining 6 cases (Cases 3, 136, 210, 226, 254, and 256), the nature of the allegation or suggestion in the opinion of the Commission rendered it unnecessary to make any inquiry.

(B.) Of the 159 cases brought to the Commission's notice during the period, of two years and eleven months, from the 1st August 1893 to the 31st July 1896, 11 are the subject of reports, here given, by medical men appointed by the Commission to make inquiry into them.

O 94060. Wt. 4309.

I. — An analysis, prepared for the Commission by Dr. Sidney Coupland and Dr. Theodore Dyke Acland, of the reports made by Medical Inspectors of the Local Government Board on two hundred and five cases in which death, occurring on or between the 1st November 1888 and the 30th November 1891, had been alleged or suggested to have been connected with Vaccination.

On the 25th January 1889 *the Registrar-General issued a circular letter to Registrars of Births and Deaths throughout England and Wales instructing them, on registering any death stated to have resulted either directly or indirectly from vaccination, to forward immediately to the Local Government Board a certified copy of the entry, so that an inquiry might be made into the case.*

An inquiry was made into the cases thus notified, as well as into others which were reported to the Board in various ways. During a period of three years and one month, from the beginning of November 1888 *up to the end of November* 1891, 205 *cases were investigated and reports on them made by the Medical Inspectors of the Board.*

In the following analysis of these reports an attempt has been made to give the essentials of each investigation, with which object in view the following points have been especially noted :—

1. *Source of lymph.*
2. *Vaccinifer.*
3. *Co-vaccinees.*
4. *Sub-vaccinees.*
5. *Course of vaccination and illness.*
6. *Treatment of vesicles.*
7. *Method of vaccination.*
8. *Previous history.*
9. *Family history.*
10. *General surroundings.*
11. *Sanitary condition.*

To the above a summary is added giving the opinion expressed in the report *as to the nature of the injury and its probable origin, and, in cases in which no conclusion has been arrived at by the reporter, a note is added if necessary drawing attention to any special points in the case.*

The cases have been classified by us under six main headings :—

Class.	*Number of cases comprised in each class.*
A.—Inflammatory cases	*116*
B.—Septic cases	*16*
C.—Cases of gangrene, or phagedænic ulceration	*1*
D.—Cases in which a suspicion of syphilis has been raised	*13*
E.—Cases complicated by various diseases	*9*
G.—Cases complicated by non-specific skin eruptions	*9*
O.—Cases, other than the foregoing, in which it is doubtful what, if any, influence was exercised on the result by vaccination.	*41*
Total	*205*

With the exception of classes C., E., and G., these have been again sub-divided :—

Class.	Number of cases comprised in each class.	List of cases comprised in each class.
Aa.—Cases in which vaccination was followed by glandular abscess	3	Cases LXXXI., CXXXIII. and CLXIV.
Ab 1.—Cases in which vaccination was followed by cellulitis or sloughing and in which there is ground for supposing that the lymph or vaccinator were at fault	3	Cases LX., XCIV. and CXCII.
Ab 2.—Cases in which vaccination was followed by cellulitis or sloughing, in which there is evidence of some extraneous source of danger	9	Cases XLII., LXXX., CIII., CXXVI., CXXXII., CXLVI., CXLVIII., CLXXVI. and CCIII.
Ac 0.—Cases in which vaccination was followed by erysipelas in which no extraneous cause was found	14	Cases XXIII., XXVIII., XXX., XXXVII., XLI., XLIV., LXXI., LXXXIX., XCVIII., CIX., CXXXV., CXXXVII., CXLIV. and CLXXVIII.
Ac 1.—Cases in which vaccination was followed by erysipelas, in which there is evidence to show that either the vaccinator or the lymph were at fault	32	Cases XVI., XXXI., XXXIV., XXXV., XL., LXV., LXIX., LXXXIII., LXXXIV., LXXXV., C., CI., CIV., CVIII., CXVI., CXVIII., CXX., CXXVIII., CXLI., CXLII., CLV., CLXVI., CLXVIII., CLXIX., CLXXII., CLXXIV., CLXXIX., CLXXXV., CLXXXIX., CXCVII., CXCVIII. and CXCIX.
Ac 2.—Cases in which vaccination was followed by erysipelas, in which there is evidence to show that there were extraneous sources of danger apart from the method of vaccination or the lymph	43	Cases XV., XVII., XX., XXI., XXIV., XXIX., XXXII., XXXIII., XXXVIII., XXXIX., XLIII., LXII., LXVII., LXXXVI., LXXXVII., LXXXVIII., XCII., CVI., CXIV., CXVII., CXXII., CXXIII., CXXIV., CXXXI., CXXXIV., CXXXVI., CXXXIX., CXLV., CXLIX., CLI., CLII., CLVI., CLIX., CLXVII., CLXXV., CLXXVII., CLXXX., CLXXXII., CXC., CXCI., CXCV., CC. and CCII.
Ac 3.—Cases in which vaccination was followed by erysipelas, in which the vesicles were irritated or the scabs injured	8	Cases XVIII., XXII., XXV., LXVIII., CXIII., CXV., CL. and CLIII.
Ae.—Cases in which vaccination was followed by ulceration of vesicles	4	Cases CLXXIII., CLXXXVIII., CXCIII. and CCI.
B 1.—Cases in which vaccination was followed by pyæmic or general septic infection and in which there is ground for suspecting that the lymph or the vaccinator were at fault	5	Cases LXXXII., XCVII., CVII., CVII.(a) and CXXI.
B 2.—Cases in which vaccination was followed by pyæmic or general septic infection, in which there is evidence of insanitary surroundings or other sources of danger	11	Cases XXVII., LIV., LIX., LXX., LXXVIII., LXXIX., XCI., CV., CXII., CXXV. and CCIV.
C.—Gangrenous, or phagedænic ulceration	1	Case XIX.

Class.	Number of cases comprised in each class.	List of cases comprised in each class.
Da.—Cases in which though the suspicion of syphilis has been raised there is ground for believing that death was unconnected with that disease or with vaccination	3	Cases XLVIII., XLIX. and CXLVII.
Dβ.—Cases in which there is ground for suspecting an inherited syphilitic taint	4	Cases XLV., XLVI., XLVII. and CXCVI.
Dγ.—Other cases in which the suspicion of syphilis has been raised	6	Cases LXXII., XC., CXXVII., CXXIX., CLXXI. and CLXXXI.
E.—Cases complicated by various diseases	9	Cases X., XXXVI., LIII., LXI., LXIV., LXXIII., LXXVI., LXXVII. and CLXXXIV. (And see Cases LVIII., LXXV., LXXXIX., CII., CXVI., CLXII. and CXCIV.)
G.—Cases complicated by non-specific skin eruptions	9	Cases LI., LVIII., LXXV., XCIX., CX., CXI., CXXX., CLXII. and CXCIV.
O1.—Cases in which vaccination was normal, and in which there is evidence to show that death was unconnected with it	14	Cases III., IV., V., VII. IX., XCIII., XCV., XCVI., CXXXVIII., CLX., CLXI., CLXV., CLXXXVI. and CLXXXVII.
O2.—Cases in which vaccination was followed by death, and in which, although the cause of death is uncertain, no connexion between it and vaccination has been traced	12	Cases I., II., VI., XI., XIV., LV., LVI., LVII., LXXIV., CII., CXI. and CLXIII.
O3a.—Cases in which vaccination was followed by death, but in which, vaccination having pursued a normal course, its influence in bringing about the fatal result was either secondary or doubtful	3	Cases L., CLVIII. and CLXX.
O3β.—Cases in which vaccination was followed by death and in which, although vaccination was not normal, its influence in bringing about the fatal result was either secondary or doubtful	3	Cases VIII., CLIV. and CLVII.
O4.—Cases in which the cause of death is certain, and in which vaccination having pursued a normal course its influence on the fatal result is doubtful	5	Cases XIII., XXVI., CXIX., CXLIII. and CLXXXIII.
O5.—Cases in which abnormal vaccination, probably due to the child's previous condition, may have contributed to the fatal result	4	Cases XII., LII., LXIII. and LXVI.

The cyphers in the margin at the head of each analysis show what in each case seems, from the report, to be the probable cause of death; the letters and numbers (other than those in brackets or below a line) referring to the six main classes or their subdivisions. The numbers in brackets refer to the week after vaccination in which the symptoms first appeared, and the letter "V" within the brackets shows that the vesicles were opened on the eighth day. The numbers below the line in some of the cyphers mean:

0. *That no extraneous cause was found;*
1. *That the lymph or vaccinator were at fault;*
2. *That the surroundings were insanitary, or that there was some other source of danger*
3. *That the vesicles were irritated or the scabs injured.*

The single capitals signify that human, the reduplicated capitals that calf, lymph was used. Thus, $\frac{\mathbf{AA^c}}{1}(2.\overline{V})$ *means calf lymph, vesicles opened on the eighth day, erysipelas in second week, lymph or vaccinator at fault.*

O2. CASE I., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE REGISTRAR-GENERAL.

(*Report dated 17th September* 1889.)

Case of. P. B., female, age six months.

Vaccination. October 23rd, 1888, by Public Vaccinator.

Death. November 1st, 1888.

Certified cause. Uncertified.

Death was due according to father's statement to "convulsions probably owing to vaccination."

Source of lymph. The lymph was taken directly from the arm of A. W., a healthy child (with healthy parents), in whom vaccination pursued a normal course.

Co-vaccinees. H. M. healthy child. Vaccination normal.

Sub-vaccinees. None. The vesicles were opened, but the lymph was not used.

Course of vaccination. The vesicles never presented any but a healthy appearance.

Course of illness. The 8th day on which the child was inspected was so wet and cold that the mother did not return home (6 miles), the same night, October 30th. The child was well on the 9th day, October 31st. At 4 a.m. on November 1, when the father went to work nothing was noticed amiss, but at 7 a.m. the child was found frothing at the mouth, and apparently insensible. It was dead before the doctor arrived, and he refused to sign the certificate of the cause of death.

Summary of reporter's conclusion. There is nothing in the history of the case to justify the belief that vaccination had anything to do with the child's death.

[T. D. A.]

O2. CASE II., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE REGISTRAR-GENERAL.

(*Report dated 2nd November* 1889.)

Case of. B. T. N., male, age eight weeks.

Vaccination. In 6th week, November 26th, 1888.

Death. December 25th, 1888.

Certified cause. "Convulsions three weeks after vaccination."

Source of lymph. Not stated.

Co-vaccinees. Not stated.

Sub-vaccinees. Not stated.

Course of vaccination. The mother states that the vesicles could not have done better. She had no suspicion that vaccination was the cause of the child's death.

General conditions. The child had been attended for "convulsions" before vaccination, for one month; and seems to have been better after vaccination until the day before its death, when the convulsions again recurred. The certifying doctor states "that he did not mean the certificate to "imply that vaccination had any effect in causing "death, but simply to record the fact that convulsions "occurred three weeks after vaccination."

Family history. One child who had not been vaccinated had previously died of convulsions.

Summary of reporter's conclusion. The child appears to have died of a disorder from which it had suffered previous to vaccination, and which does not seem to have been aggravated by the operation.

[T. D. A.]

O1. CASE III., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated 7th February* 1889.)

Case of. M. O., female, aged four months, illegitimate daughter of a servant girl.

Vaccination. January 9th, 1889, by Public Vaccinator.

Death. January 29th, 1889.

Certified cause. "Vaccination, 14 days; bronchitis and convulsions, "two days."

Source of lymph. Arm to arm. Vaccinifer inspected and found healthy.

Co-vaccinees. Four, all healthy.

Sub-vaccinees. None.

Course of vaccination. Normal. Grandmother positive that no redness or swelling of arm. Vesicles not touched by public vaccinator when inspected on 8th day.

Course of illness. Usual health till January 25th (17th day) when became fretful; and grandmother, thinking "there might be inflammation coming on," applied bread poultices, which caused detachment of scabs. The restlessness increased, and on 27th convulsions set in, and were renewed at intervals till death, and doctor only called in on evening of 28th. There was no cough or shortness of breath. [The death certificate is in error in stating that 14 days had elapsed since vaccination; it should be 20].

General conditions. Infant had been suckled by mother for fortnight, and then fed on Robb's biscuit and Swiss milk.

Summary of reporter's conclusion. The vaccination appears to have been running a normal course, when convulsions supervened 18 days after the operation. These convulsions, which were the immediate cause of death, cannot be attributed to the vaccination. There is no clinical evidence of the existence of bronchitis given in the report.

[S. C.]

CASE IV., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR. O

(*Report dated 14th February* 1889.)

Case of. H. R. P., male, age 17 months.

Vaccination. December 1st, 1887, by Public Vaccinator; in 13th week.

Death. February 3rd, 1889.

Certified cause. "Vaccination, 14 months; convulsions, three "months."

Source of lymph. Not stated.

Co-vaccinees. Not stated.

Sub-vaccinees. Not stated.

Course of vaccination. Up to date of inspection, December 8th, vaccination proceeded normally; a shield was then used, which became dirty and offensive, the padding was once changed by the mother in consequence. The sores were long in healing, and the application made on the advice of a chemist (tar ointment) seems to have caused further irritation.

Sub-history. Eczema of scalp and ears occurred four months afterwards. This was entirely well by the following April (1888). During the summer the child had diarrhœa, but on being dieted and weaned throve well, until the commencement of 1889, when it suffered much from dentition. On February 3rd, 1889, it had a convulsion and died at midnight.

Summary of reporter's conclusion. Death occurred 14 months after vaccination, during a portion of which period the child had been in good health; it appears to have been due to one of the disorders frequent in children during the period of dentition.

[T. D. A.]

CASE V., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR. O1

(*Report dated 25th February* 1889.)

Case of. E. C., female, age not stated.

Vaccination. January 24th, 1889, by Public Vaccinator. Arm to arm.

Death. February 5th, 1889.

Certified cause. "Broncho-pneumonia, 10 days; convulsions, 10 hours; vaccination."

Source of lymph. From arm of child B., who was in good health, in whom vaccination ran normal course, and who, when seen by inspector, had four good cicatrices.

Co-vaccinees. Three in number: (*a*) arm somewhat inflamed in first week, but had gone on well and showed three small marks; (*b*) did well, five good marks; (*c*) when inspected a dry greenish scab had coalesced over vesicles: child seemed healthy, but was ill cared for.

Sub-vaccinees. None.

Four insertions; all rose; vesicles ran normal course; no inflammation; vesicles unbroken and scabbed over at time of death.

On 25th (2nd day) child unwell, catarrhal symptoms, but no cough or feverishness. On 28th seen by doctor, who prescribed medicine and poultices to chest. February 2nd, being no better, doctor again called and continued in attendance till death. Bronchitis, which did not terminate in usual manner, but symptoms like meningitis (one or two fits) shortly before death.

Child previously healthy.

House a small corner one, with windows on adjacent sides, but no back space; not clean or well kept.

Death was due to intercurrent bronchitis, and had no relation with the vaccination. The infant may have taken cold from exposure in going to or returning from the vaccination station.

[S. C.]

CASE VI., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated 30th October* 1889.)

J. J., male, age not given.

March 22nd, 1889.

March 27th, 1889.

Uncertified; but entered in register as "Convulsions; "vaccinated with doubtful effect."

Taken directly from arm of a healthy child (H.) in whom the course of vaccination, both before and subsequent to opening of vesicles, was normal.

One child, D., vaccinated four days after J. J. with same lymph stored on points. "Several others," all stated to have done well, none, however, were seen at time of inquiry.

None.

The child died five days after vaccination, consequently vesicles were imperfectly developed, and no lymph had formed. There was no evidence of surrounding inflammation.

The child had not been well previous to vaccination. It is reported to have suffered much from constipation and is said to have been dosed with castor oil every other day. It was fed on condensed milk and biscuits, and was taking food badly before vaccination.

Two days before death, the child refused food and was very irritable. The following day it became quiet, and lay quite still taking no notice. It died without any doctor having been sent for.

The information obtainable in this case is very imperfect. The reporter concludes that death was probably due to malnutrition, the result of unsuitable feeding.

[T. D. A.]

CASE VII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated 18th April* 1889.)

E. P., female, age not given.

Date not given.

Date not given.

"Convulsions; vaccination."

Not given.

Not stated.

Not stated.

"Perfectly normal in every respect." Neither the doctor who attended the child, nor the guardians of the child attributed death to vaccination.

"The child was teething and had suffered from con- "vulsions on several occasions prior to the attack which "led to her death."

The reporter concludes that death resulted from exhaustion, due to irritation of the central nervous system consequent upon the process of dentition.

[T. D. A.]

CASE VIII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR. O3β/G (1.)

(*Report dated 17th August* 1889.)

T. R., female, age four months. *Case of.*

May 23, 1889, by Public Vaccinator at private residence. *Vaccination.*

June 2, 1889. *Death.*

"Vaccination; brain disturbance; shock to system; "facial and cervical paralysis; and collapse." *Certified cause of.*

Tube received 7–10 days before from N. V. E. The lymph came originally from the Public Vaccinator, at E——. *Source of lymph.*

Well-developed healthy boy. Had never had a day's sickness. *Vaccinifer.*

Six tubes of same lymph were sent to six vaccinators. Five report as follows:— *Co-vaccinees.*

(1.) "Very satisfactory."
(2.) "Successful in two cases out of four."
(3.) "Unsuccessful."
(4.) "Not used."
(5.) "Doubtful whether used or not."

None. *Sub-vaccinees.*

3rd day. Arm a little red. *Course of vaccination.*
4th day. Eruption like nettle stings on face and head, subsequently developing on legs and arms. No blisters or pustules.
9th day. All eruption disappeared. Arm red from shoulder to elbow.
10th day. Arm "going on satisfactory," vesicles unbroken, a "moderate amount of redness" only.

8th day after vaccination the child seemed ailing. *Course of illness.*
9th day. "Unable to open its mouth."
10th day. Mr. B. was sent for; he found the child with "pulse small, scarcely perceptible, extremities cold, "mouth drawn towards right side, and unable to make "any effort at swallowing." The condition of the arm was satisfactory.
11th day. The child died.

Good. *Previous history.*

The child's death appears to have resulted from some affection of the central nervous system. The reporter is of opinion that it was due to some other cause than vaccination. *Summary of reporter's conclusion.*

[T. D. A.]

CASE IX., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR. O1.

(*Report dated 25th July* 1889.)

C. H., male, age not given. *Case of.*

July 4, 1889, by Public Vaccinator. *Vaccination.*

July 10, according to the certificate. *Death.*

Not stated. *Certified cause.*

Direct from arm of child, No. 495 in register. *Source of lymph.*

No details given, but that vaccination was normal. *Vaccinifer.*

One. The results of vaccination were "normal." *Co-vaccinees.*

None. *Sub-vaccinees.*

According to the mother "vaccination went on quite "well, and was free from inflammation round the pocks "up to the morning on which the child died. *Course of vaccination.*

Previous to vaccination and after the operation, up to July 9, the child was well. On July 9, according to the mother's statement, the child was seized with diarrhœa, "along with other children," and the mother herself and many children of neighbours; one infant is said to have died besides C. H. *Course of illness.*

The sink pipe in the back yard was choked up during the week the children were taken ill, and the smell from the drains was very bad. The flags had to be taken up to get at the drain, and it was found that offensive slops and waste water had spread beneath them. *General surroundings.*

Three other children of the same family have died between the ages of three and nine months of diarrhœa uncomplicated by vaccination. *Family history.*

Summary of reporter's conclusion. The child died from an attack of acute diarrhœa apparently due to the season of the year, and the insanitary conditions of the house and surroundings. The course of vaccination was throughout normal.

[T. D. A.]

E.

CASE X., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.*

(*Report dated 11th November* 1889.)

Case of. G. E. B., female, age two months.

Vaccination. September 10, 1889, by Public Vaccinator; arm to arm.

Death. October 5, 1889.

Certified cause. "Vaccination, three weeks; tetanus, three days."

Source of lymph. F. R., female, age five months.

Method. Four insertions with Cooper-Rose's instrument (four needles on a handle).

Vaccinifer. Could not be seen by reporter, as family had removed, but he was informed that it had no bad symptoms and passed through its vaccination well.

Co-vaccinees. Six in number. In each case, normal on 8th day nor any undue areola. In four cases the mothers told the reporter that they had never seen such good results, the fifth case was reported by the public vaccinator to have given no trouble, and the sixth was used on 17th as vaccinifer for four other children. During second week its arm became inflamed, but it made a good recovery. Three of its four sub-vaccinees were seen and found normal; the fourth had removed.

Sub-vaccinees. None.

Course of vaccination. Normal on 8th day. Vesicles not punctured. The next day (September 18th) redness began to appear around vesicles, and extended for a short distance (not more than an inch).

Course of illness. On September 20th (11th day) the mother noticed a "bluish" appearance in region of vaccination marks. They began to discharge on September 23rd, and on 24th (15th day), under medical advice, the arm was bathed with oatmeal and warm water and dressed with zinc ointment. The mother applied the ointment on old rags, and also put on a shield, which she re-covered with clean rags daily. The discharge was thick and offensive. On October 1st (22nd day) the mother began to poultice the arm, and next day noticed that its mouth was "drawn tight" and it did not suck. This was followed by more marked tetanic symptoms, coming on in paroxysms of opisthotonos with impeded respiration, in one of which the child died.

At the time of onset of the tetanus there was a dry-looking slough over the vaccinated part, but no inflammation or redness of the arm.

Family history. Mother pale and sallow, subject to severe headaches and neuralgia. Father of poor physique. There had been five children; one died from "croup," aged four years. The three living children were aged eleven, eight, and four respectively, and the youngest at reporter's visit was suffering with croupy symptoms.

History of vaccinee. Partly suckled, partly hand-fed with condensed milk and water. The clothes were "shortened" on September 22nd, and it then wore a red "Turkey-twill" dress, sleeves lined with linen; vesicles not in contact with sleeve, but protected by the shield. Mother did not know of any injury or irritation of the vesicles, but asserts that the child lost flesh after the vaccination.

Dwellings. No fault found with the surroundings except that poultry and tame rabbits kept in yard close to back door.

Summary of reporter's conclusion. Did well up to 9th day, and suppuration began on 14th day, but no erysipelas. Tetanus set in on 23rd day. Death on 26th day (October 5th). Reporter acquits the lymph used and the operation of being the cause of tetanus, which is most unusual after vaccination. But tetanus may follow very slight injuries, and it is regarded as noteworthy that on November 2nd, at a house distant half-a-mile from that of B., an infant aged ten days died from tetanus supervening upon an unhealed umbilicus.

[S. C.]

* *This case is also amongst those brought to the notice of the Commission with a view to their investigation; being the same as that numbered as Case 4 on page 215. The case was not, however, investigated by a medical man on behalf of the Commission.*

CASE XI., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated 12th November* 1889.)

F. W., male, aged 3½ months.

October 15th, 1889, by Public Vaccinator, who urged postponement because of the child's puny state, but mother desired it since her other children "had thriven so well after it." Arm to arm?

November 2nd, 1889.

"Vaccination."

Vaccinifer perfectly healthy and its vaccination normal.

One favourable case.

None.

Three insertions, all took. On October 22nd (8th day) all vesicles had risen; no inflammation; arm not opened. Subsequently they got broken, and mother applied some lead ointment; the places healed and got well. After death the right arm showed "three good "healthy-looking brown scabs. It was evident that "vaccination had taken normal course."

Child puny and ailing from birth; wasted limbs, pinched face, large head, evidently ricketty. It simply "grew weaker and died."

Parents healthy; only seven out of twelve children living. Four boys and one girl dead, all born puny and ailing. One boy died from "fits" at four months, shortly after going through vaccination; another at two years and five months; another at nine years and three months, and girl at fourteen months. In these three health improved after vaccination. Of rest, girls healthier than boys. One boy at two years and two months: obviously ricketty; another at eight years and 10 months, puny as infant, got better after vaccination and "quite stout" at five years, since pale, but considered healthy. Two girls, at 12 and 14, had remarkably large heads, but seemed well.

A half-brother of Mr. W. (whose mother was aunt to Mrs. W.) had lost one boy with hydrocephalus and another in a decline.

F. W. was treated at London Hospital for "strophulus" when three weeks old.

There is no evidence that the vaccination, which was reluctantly performed by the public vaccinator, and only because the mother insisted upon it, had any share in cutting short the life of the child, who was obviously in a state of feeble nutrition and vitality. It is noticeable that in spite of this constitutional debility, the vaccination ran a normal course.

[S. C.]

CASE XII., REPORTED TO LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated 3rd January* 1890.)

A. H. W. C., male, aged two months.

September 26th, 1889, by Public Vaccinator.

October 17th, 1889.

"Sloughing of the arm after vaccination (three "weeks). Diarrhœa and exhaustion."

Direct from arm of child (B.).

Vaccination normal. No inflammation of the arm. Some temporary swelling of axillary glands.

Two other children were vaccinated from same lymph at the same time.

One "did well and had not a bad symptom."

The other "had some inflammation of the arm on the "8th day and blebs round about the places. A crust "formed and covered all the places, but it came away, "and the child ultimately did well."

Note.—*Nine* other children were vaccinated at the same time from another source, "*all* were normal."

None.

4th day. Child "cross and poorly."

8th day. "Redness round the vesicles." "Small "blebs or blisters near the places," and "the arm was

weeping." Mother *believes* this "weeping" began on the 6*th* day. The redness round the vesicles did not spread.

11*th day*. *About* this time the mother states "the "weeping ceased . . . . . and crusts began "to form. The redness disappeared and one large crust "ultimately covered the places." Mother believes "on one occasion the crust smelt unpleasantly."

5th day (September 30th). Cold cream applied. The vesicles were injured by sleeve of nightgown. Date uncertain.

18*th day*. Poultices ordered. Vesicles were not opened. No shield was applied.

October 8th or 9th (13th or 14th day). "The child "began to suffer from severe diarrhœa."

October 11*th* (16th day). Child was seen by district medical officer. He said the arm "was all right and "prescribed for the diarrhœa."

October 13*th* (18th day). Child was seen by Mr. H.; told mother to "poultice the arm."

October 15*th* (20th day). Diarrhœa continued.

October 17*th* (22nd day). Child died. Mother states all inflammation of arm had subsided.

Note.—"Summer" diarrhœa was prevalent in the neighbourhood.

The child was delicate from birth.

Mother could not suckle her child; it was ill-fed, and was put out to nurse.

Father, aged 20, "sickly looking" and delicate. Out of work for 18 months.

One brother died of consumption.

Mother aged 21.

The child died from exhaustion resulting from an attack of acute diarrhœa. There had been inflammation of the arm after vaccination, which had subsided when the diarrhœa first began. The child had always been weakly; it was ill-fed and ill-cared for. The parents married recklessly young, the father was delicate and had been long out of work. It is probable that the vaccination, pursuing as it did an abnormal course, tended in the child's weakly state to predispose it to the illness from which it died.

Note.—In two out of three cases vaccinated from the same lymph the results were abnormal; though there does not seem to have been any want of care in the choice of vaccinifer or method of vaccination.

[T. D. A.]

CASE XIII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated 24th December* 1889.)

C. M. E. L.

November 21st, 1889. One insertion only on left arm. Private case.

? Date.

"Vaccination 9th day. Vomiting and diarrhœa two "days. Exhaustion."

Tubes taken "recently" from arm of another baby (private patient). One insertion only, because child, though healthy, looked delicate, and because father objected to more than one place. Vaccinifer seen by inspector had gone through normal vaccination—two scars.

Two; inspected; normal; two recent scars.

Not stated.

Normal up to 8th day.

On 8th day of vaccination child attacked with slight vomiting and diarrhœa, which latter continued throughout next day when child passed into state of collapse; convulsions; death.

Father did not attribute death to vaccination, which he thought was running its proper course. Four years ago he lost a child from a similar short and sudden illness, unassociated with vaccination.

Death was caused by gastro-enteritis, independent of the vaccination, which was running a normal course.

[S. C.]

CASE XIV., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR. **O4.**

(*Report dated 2nd January* 1890.)

A. T. P., male, aged three months. — *Case of.*

December 9th, 1889, at public vaccination station. — *Vaccination.*

December 23rd, 1889. — *Death.*

"Bronchial catarrh four days, hepatitis three days, "vaccinated on 9th instant." — *Certified cause.*

Not stated. — *Source of lymph.*

Not stated. — *Co-vaccinees.*

Not stated. — *Sub-vaccinees.*

Both the doctor who attended the child and the friend who nursed it state that the vaccination had done perfectly well. — *Course of vaccination.*

No details are given, but the woman who had the child on her lap when it died, states that she believes that the child "died of bronchitis, with something like "a convulsive seizure at the end"; and the doctor states that "he did not intend to suggest any connection "between the child's vaccination and its death, but "merely thought it right to state the fact of the "vaccination." — *Course of illness.*

There is no evidence to show that vaccination was the cause of the child's death. — *Summary of reporter's conclusion.*

[T. D. A.]

CASE XV., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE REGISTRAR-GENERAL. **$\frac{Ac}{2}$(1).**

(*Report dated 17th September* 1889.)

F. J., male, age five months. — *Case of.*

October 8th, 1888, by Public Vaccinator, unsuccessful. October 15th, 1888, repeated. — *Vaccination.*

November 3rd, 1888. — *Death.*

"Vaccination; erysipelas; bronchitis 10 days." — *Certified cause.*

On October 8th, from stored lymph.
On October 15th, direct from A. B., female, three months, who had "taken successfully from vaccination "on 8th, from same source as unsuccessful in F. J., "vaccinifer (A. B.), healthy, vaccination ran ordinary "course, and at time of inspection presented two large "well foveated scars." — *Source of lymph.*

Two: (*a*) M. A. S., female, three months, inspected on 8th day (22nd), normal; (*b*) L. P., male, one month, also normal (died May 1889, from bronchitis). — *Co-vaccinees.*

None. — *Sub-vaccinees.*

Mother stated that vaccination (on 15th) in two places; both "took," and followed ordinary course till 21st, when they appeared much inflamed and dark, so that she applied cream to them. — *Course of vaccination.*

Much worse on 22nd, and child could not be taken for inspection; doctor called in and found erysipelas spreading up the arm. It thence extended to head, body, and lower limbs. Later bronchitis supervened and child died on November 3rd, 19 days after vaccination. — *Course of illness.*

Child fed on breast milk entirely. No vaccination shield used; sleeve slit up for vaccination; dress dyed red (probably some aniline dye).
House "extremely filthy and badly kept."
The doctor believed that in this child any sore would have taken an unhealthy action. — *General conditions.*

Six children, of whom five living. One suffering from tubercular disease at time of F. J.'s. vaccination. Doctor said that all were unhealthy and had been treated for tubercular affections. Mother much occupied with attending on other sick child at this time. — *Family history.*

The cause of death in this case was erysipelas, which supervened upon vaccination commencing on 7th day. It is noticeable that the vaccinifer and co-vaccinees passed through their vaccinations without complications. Probably in the fatal case the vaccinated parts took on an unhealthy action from external contamination, *e.g.*, the dye of the child's dress, or through careless treatment. The application of cream may be in part responsible, and there is evidence that the mother was — *Summary of reporter's conclusion.*

unable from her attendance on another sick child to devote much care to the infant. As further favouring causes for the development of erysipelas in this case may be mentioned the unhealthy strain in the family and the insanitary condition of the dwelling.

[S. C.]

$\frac{Ac}{1}$(2.V).

CASE XVI., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE REGISTRAR-GENERAL.

(*Report dated 10th December* 1888.)

Case of. A. E. M., male, age four months.

Vaccination. October 22nd, 1888, by Public Vaccinator.

Death. November 12th, 1888.

Certified cause. "Vaccination. Erysipelas eight days."

Source of lymph. From arm of child E. C.

Vaccinifer. Vaccination normal. Arm quite healed, November 23rd.

Co-vaccinees. Four with same lymph.
Five others vaccinated the same day from other sources.
Inflammation was abnormally severe in most of these cases.

Sub-vaccinees. Four primary.
One re-vaccination?
Two other children vaccinated the same day from other sources by Mr. C.
Inflammation was abnormally severe in most of these cases.

Course of vaccination. By inference normal until the 8th day, when the child was inspected and lymph taken from the arm.
On the 10th or 11th day after vaccination the arm began to be much inflamed.
On the 14th day (November 4th) the child was taken to Mr. C.
On November 5th it was seen by Mr. W. It had at this time very extensive cutaneous erysipelas.

Previous history. Good.

Vaccinator. On November 4th Mr. C.'s eyelids were noticed to be much swollen, and he died of "erysipelas, apoplexy" four days later (November 8th). Dr. P. who attended him and signed the certificate of death, saw no symptoms of erysipelas before November 4th. How Mr. C. contracted it is not known. Two deaths only are recorded as having occurred in the General Infirmary on November 11th and 12th. One from "cirrhosis of liver, erysipelas nine days," the other from "renal disease and local sloughing from lymphangitis." Mr. C. did not, however, attend either of these cases.
Although Mr. C. was known sometimes to have been careless in his method of vaccination, no facts are brought forward in this instance.

Summary of reporter's conclusion. The child died of erysipelas, spreading from the vaccination wounds. The first symptoms manifested themselves two or three days after the inspection and opening of vesicles by Mr. C. who is reported not to have shown signs of the disease himself until November 4th, four or five days after the vesicles had been opened. There is no evidence to show how Mr. C. contracted the disease. The source of infection was not traced, but both Mr. C. and the child were attacked almost simultaneously; Mr. C. himself being ill at the time the mother took her child to him for advice.
Note.—It is a significant fact that the majority of the vaccinations performed on October 22nd and 30th (Mr. C.'s last attendance at the station) did not run a normal course, the inflammation being in most cases abnormally severe.

[T. D. A.]

$\frac{Ac}{2}$(1).

CASE XVII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE REGISTRAR-GENERAL.

(*Report dated 21st April* 1889.)

Case of. M. R., female, age seven months.

Vaccination. October 22nd, by Public Vaccinator in room of cottage used for this purpose only.

Death. November 12th, 1889.

"Erysipelas *after* vaccination."

Direct from arm of child (A. C.).

Healthy child of healthy parents; vaccination normal; no undue inflammation prior or subsequent to lymph being taken. Co-vaccinees of vaccinifer (2 in number) also healthy and vaccinations normal.

Two (A. T. and W. E.). In both vaccination was regular and satisfactory.

None.

On 4th or 5th day arm became inflamed, and linseed poultices were applied.
8th day inflammation extended to shoulder and chest. Child too ill to be taken for inspection.
10th day, seen by Mr. M., who found erysipelas extending to chest, back, and abdomen. The vaccination "vesicles had begun to dry in the centre, and the areola around had begun to fade," the wounds "looked most satisfactory."
Subsequently the vesicles scabbed over and though the vaccinated arm was free from redness, the erysipelas extended over the body and other limbs and terminated fatally on 21st day.

The surroundings of the cottage in which the child lived were filthy. There was no privy, no drainage. Slops stagnated in puddles close to the door; alongside a refuse heap, upon which excrement was deposited. The father, mother, and four children slept in two beds on one side of a partition in the upstairs room, on the other side slept an old bed-ridden man of 80. All the family except the old man and the infant had suffered from severe sore throats, commencing about a fortnight before the vaccination was performed. Mr. M. called them "acute tonsillitis" he "couldn't make up his mind that they were cases of diphtheria," but considered them due to "the insanitary condition around and about the cottage." Mrs. R. was at the time of her illness suckling her infant and continued to do so. The first day that she was able to get out she took her infant to be vaccinated.

Death was due to erysipelas supervening on vaccination. While suffering from an open wound on its arm the child was exposed to two distinct sources of danger.

(*a.*) The insanitary and filthy state of the cottage and its surroundings.
(*b.*) The presence of an acute contagious disorder, which attacked the other inmates of the cottage.

[T. D. A.]

CASE XVIII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated 12th March* 1889.)

D. T. L., male, age three months.

January 1st, 1889, by Public Vaccinator (in room used as a surgery, small, ill-ventilated. No case of erysipelas or bad surgical case known to have been seen there at the time).

January 30th, 1889.

"Vaccination, one month. Erratic erysipelas, three weeks."

"Stored lymph" in tubes, charged on December 4th from arm of D. W. a fairly healthy child (vaccinated on November 27th) who about February 23rd said to have had a slight eruption of eczema behind ears. At date of inspection (March 2nd?) five healthy-looking vaccination scars.

E. M. whose mother sat next to Mrs. L. at vaccination station, and who at the time had two children at home recovering from measles. E. M. brought to public vaccinator for inspection on January 8th, and on 9th fell ill of measles. When seen by reporter (March 2nd?) had quite recovered from measles and vaccination, and preserved three well-marked vaccination scars.

None.

Note.—(On the same day (January 1st) five other children vaccinated with lymph from two distinct sources:—(*a.*) Unsuccessful. (*b.*) and (*c.*) Quite normal.

(*d.*) Some ulceration or "retarded" healing of scars. (*e.*) Small abscess below scars some weeks afterwards. Both (*d.*) and (*e.*) came from dirty, neglected households.

When inspected on the 8th day vesicles had broken, exposing a raw, discharging surface, with considerable inflammation around, but not extending below elbow. Mother stated that vesicles formed within two days of the vaccination, and had broken and were discharging on 3rd and 4th days. She put on a little white ointment.

A week later the doctor (same as public vaccinator) sent for. He found erysipelatous inflammation extending to fingers; arm considerably swollen. Subsequently this inflammation diminished, and the "vaccination pustules got pretty dry and healthy." But the erysipelas extended across chest and down opposite arm and leg. Child was getting better, and doctor thinks it might ultimately have recovered, when mother applied over greater part of body a thick "treacly" material (composition ?) on recommendation of a collier friend.

No erysipelas or other zymotic disease apparently existed in the neighbourhood.

D. T. L. was the only child in house, of which other inmates were the grandfather and grandmother, three of their grown-up sons, their daughter and son-in-law, parents of D. T. L.

House fairly clean, roomy, and well ventilated. Kitchen in evening, when all assembled, would be crowded. Just outside kitchen door a confined area in which was a dilapidated and foul drain gully. Closets (ill-flushed pan-closets) exceedingly foul, at some distance from house.

The erysipelatous inflammation arose from the open sores left by the premature rupture of the vesicles. Whether the fact stated in the report that at the vaccination station the infant was next to a person who came from a house where measles was present had anything to do with the course taken by the vaccination it is impossible to determine. The child did not itself take measles as did the co-vaccinee, and in spite of this the latter did well as regards vaccination. Probably the vesicles ruptured from being rubbed, and the sores became contaminated by foreign matter. The imperfect sanitary condition of the house may have been responsible for such contamination.

[S. C.]

CASE XIX., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated 12th July* 1889.)

J. R., male, age five months.

January 1st, 1889. By Public Vaccinator. Three insertions.

February 2nd, 1889.

"Vaccinated with calf lymph, one month. Pyæmia 20 days."

Calf lymph on small ivory point—one of three points received December 29th, 1888, from Dr. Renner. Lancet (one of several kept for purpose) clean. (Dr. Renner stated that no ill results were reported from use of other lymph from same source.)

Two other children vaccinated with other two points, normal course. (All cases vaccinated January 1st, successful, including 11 with humanised lymph.)

Although tubes charged from two vesicles they were never used.

Vesicles rose duly and for week no abnormal symptoms. On January 8th inspected; normal; no areola. Two vesicles opened and tubes charged.

On evening of January 1st, child screamed constantly as if in pain; ankle swollen, thought to have been hurt. No further mention of this during rest of week, and apparently no relation to illness.

Child fell ill on January 10th (10th day), when the two opened vesicles continued to discharge, and this seemed to affect remaining vesicle. Then the places coalesced, forming deep sloughing ulcer, which improved under poultices, but death from exhaustion on February 2nd (33rd day). There was no erysipelas or severe inflammation; no axillary abscess or glandular enlargement or tenderness. Doctor admitted that "phagedænic ulceration" would have expressed condition better than "pyæmia."

General conditions. The mother stated that when the child was a month old it suffered from constipation and "snuffled," but there was no other evidence of syphilis, and no suspicion of family taint. Child was thought to be healthy. No evidence of concomitant measles or scarlatina at time of vaccination. Dwelling not clean; opposite to a meat-carrier's yard, whence at times wind brought offensive smells, and yard found to be very unwholesome from manure.

There had been one or two cases of diphtheria in neighbourhood.

Family history. Three other children, eldest æt. 9, a "fine boy"; youngest delicate looking, not unhealthy. A fourth lad died of "consumption of the bowels."

Summary of reporter's conclusion. The case was—as stated—one of phagedænic ulceration rather than "pyæmia"; and the reason for the opened vesicles taking on this unhealthy inflammation cannot be referred to exposure to any specific poison or constitutional state of the infant. The sores had no "diphtheritic" character, so that the fact of there being at the time cases of diphtheria in the district can hardly be considered as the cause of the change in the vaccination sores. The facts stated as to the dwelling and its exposure to the emanations from an ill-kept yard containing manure seem to afford a possible explanation. There is no evidence that the vesicles were contaminated at the time of their being opened. In this case "calf lymph" was used, but the evidence shows that there is no ground for believing it to have been in any way contaminated.

[S. C.]

CASE XX., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR. **Ac 2 (3).**

(*Report dated 28th August* 1889).

Case of. J. A. W., male, age four months.

Vaccination. January 1st, 1889. Private practitioner.

Death. February 13th, 1889.

Certified cause. "Post vaccinal erysipelas. Pyæmia."

Source of lymph. "Believed" to have been taken November 24th from child C., vaccinated November 17th, 1888, in whom course of vaccination entirely favourable. Stored in tubes (one used, other destroyed). Lancet used.

Co-vaccinees. None.

Sub-vaccinees. None.

Course of vaccination. Two vesicles (out of three insertions) slow in rising; on 8th day free from inflammation and certified "successful." The mother, instead of leaving arm alone, applied lint soaked in sweet oil, which she was in the habit of using constantly for application to children's heads, &c., and of which she procured fresh supplies without changing the bottle. The lint stitched inside sleeve and saturated with oil as required—but not changed. Under this the vesicles did not scab and heal normally, but child seemed well in itself.

Course of illness. On January 25th (25th day) child seemed ill and shoulder of vaccinated arm inflamed and swollen. Doctor called in and found erysipelas, which treated by dusting with flour and casing with cotton wool, and medicine given, which repeated on 28th and 31st. Dr. A. having to leave town for his health, charge of case fell to Dr. F. There was now unhealthy suppuration beneath scabs, and erysipelas extending down arm to hand. Mother had dressed arm daily, but had not changed the wool. Dr. F. removed wool and applied glycerine and carbolic acid lotion. Sores became cleaner, but erysipelas spread down left leg to foot where bullæ formed. Child sank and died on February 13th (44th day).

Family history. The sixth child. Rest all healthy. Parents believed to be quite healthy.

General conditions. House clean, sanitary conditions good. The W.'s had inhabited it for six months. Child had been kept strictly at home. No history of exposure to personal infection.

Diphtheria had been for some time present in neighbourhood, and Dr. A. fancied there was "something of

" a diphtheritic look about the sores—something different to what he had seen before."

Inspector learnt that one of other children had a rash for a day or two, about a week before the erysipelas appeared on brother's arm. Dr. A. said there was no fever and spots "appeared like rötheln." But no desquamation followed. No scarlatina in neighbourhood.

Summary of reporter's conclusion. The late development (25th day) of the erysipelas, which caused the child's death, proves that it could have nothing to do with the operation or the character of the lymph used. The unnecessary dressing of the places with oil (which may not have been free from impurities) seems to have favoured the occurrence of the erysipelatous inflammation; but apart from this, the prevalence of diphtheria in the neighbourhood, or the rash on the brother's arm, suggest other possible sources of infection.

[S. C.]

Ac/2 (1).

CASE XXI., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated 24th April* 1889.)

Case of. F. W. C., male, aged 3½ months.

Vaccination. March 14th, 1889, by Mr. E. L. W., Public Vaccinator.

Death. April 15th, 1889.

Certified cause. "Vaccination five weeks ago; erysipelas two weeks."

Certified by. Dr. F. L. B.

Source of lymph. Direct from arm of child J. W.

Vaccinifer. Vaccination throughout normal.

Co-vaccinees. Seven. In none of them were there any abnormal symptoms.

Sub-vaccinees. None.

Course of vaccination and illness. On the 8th day there were four normal vesicles with areola about ¼-inch broad, and a few small supernumerary vesicles. There was an inflamed gland in the axilla about the size of a filbert.

12th day, areola extending, child irritable and constantly rubbing the arm.

18th day, scabs adhered to nightgown and became detached, leaving raw, bleeding surfaces. Nightgown was saturated with blood-stained pus.

20th day, swelling size of half hen's egg just behind vaccination wounds; surrounding tissue red, swollen, and indurated; wounds discharging freely. Redness and swelling spread to trunk and extremities. The child died on the 33rd day.

Method of vaccination. No details given; vaccinator twice received vaccination award.

Treatment of vesicles. None up to 19th day, the blood-stained pus being allowed to remain and cake on wounds. No other details given.

Previous history. Child stated to have been healthy.

Family history. Not stated.

Sanitary condition. Dwelling unhealthy, "drain air got ready access to sleeping room." Neighbourhood generally appears to have been insanitary.

Instances of erysipelas and puerperal septicæmia in the neighbourhood "some few years back" are adduced as showing its unhealthy condition, but do not appear to have any direct bearing on the case.

General surroundings. The child's grandmother who took it to be vaccinated and inspected had suffered from phlegmanous erysipelas in the January preceding. She had suffered in a similar manner several times before, and on this occasion was not well until three weeks before the child's vaccination.

Summary of reporter's conclusion. The child died of erysipelas spreading from the vaccination wounds; the erysipelas developed during the formation of the areola.

The reporter is of opinion that "the child had abundant facility for acquiring septic erysipelatous infection," and he regards the previous condition of the grandmother as the probable source of infection.

Note.—With regard to this case it should be noted that the child is said to have been constantly rubbing the arm during the 2nd week, and that suppuration took place beneath the scabs, and the discharges were allowed to remain on the arm.

[T. D. A.]

CASE XXII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

A/3 (2).

(*Report dated 31st May* 1889.)

F. H. C., female, age three months. *Case of.*

April 6th, 1889. By private practitioner. *Vaccination.*

April 24th, 1889. *Death.*

"Convulsions five days. Cellulitis of arm nine days, following vaccination, which took place on April 6th, 1889." *Certified cause.*

Taken the same morning previously on glass from a private patient's baby by doctor, who went direct to Mrs. C.'s to vaccinate her child F. H. C. Vaccinifer seen by inspector, who found it healthy, and having three normal scars. The places had been rubbed that morning before the doctor's visit. He did not take the oozing lymph, but pricked the vesicles. *Source of lymph.*

None. *Co-vaccinees.*

None. *Sub-vaccinees.*

At mother's request doctor, instead of vaccinating in three places as is his custom, only vaccinated in one, which he made larger than usual; using a clean lancet and making five or six parallel incisions on which he rubbed the glass. *Course of vaccination.*

On April 12th (7th day) the father (not wishing lymph to be taken from his child) called on doctor and reported that the vaccination was successful, and baby going on well. Certificate given.

But on this day (April 12th) the mother had noticed that the vesicles had been slightly rubbed; some discharge on sleeve; but no redness then.

On April 13th child fretful; no visible inflammation about arm. Was taken out into park for an hour and a half on 14th—a fine sunny day. On 16th (11th day) seemed ill and weak, doctor called in and found it much collapsed, the arm slightly inflamed and tense in front (?) of the armpit. There was no suppuration of vesicle, which had a crust on it. Poultices were ordered to upper arm, but not over vesicle, which he covered with lint secured by diachylon plaster. The swelling, however, increased, and extended down arm, and on 20th convulsions occurred, and doctor attended with another practitioner to the end. There was cellulitis of shoulder, arm, and part of left hand; and towards the end the vesicles discharged purulent matter. Pneumonia of left lung detected before death on 24th. *Course of illness.*

No coloured clothes had been worn. Child fine and healthy up to vaccination. On 15th and 16th mother had applied a new "pad shield" of lint and a rim of whalebone to protect the sore place. *General conditions.*

No history of erysipelas or infectious illness in neighbourhood.

Sanitary arrangements of house good.

Mother had had small-pox twice—last time 10 years ago. Both parents living; two other children; all healthy. *Family history.*

The occurrence of erysipelatous inflammation in this case must have been due to external contamination of the sores produced by the ruptured vesicle. This began to discharge on the 12th April, and the inflammation of the arm above was not noticed until the 16th. The supervention of convulsions may be attributed to the asthenic state induced by the erysipelas. *Summary of reporter's conclusion.*

[S. C.]

CASE XXIII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR. NO INSPECTION. REPORTS FROM MEDICAL OFFICER OF HEALTH OF DISTRICT.

AA/6 (2).

(*Report dated 3rd May* 1889.)

J. B., female, age 3½ months. *Case of.*

April 4th, 1889, by Medical Officer of Health, private practitioner. *Vaccination.*

May 1st, 1889. *Death.*

"Erysipelas following vaccination with calf-lymph "(vaccinated April 4th, erysipelas developed 12th). "Peritonitis 48 hours."

Calf-lymph in tube.

Three other children at same time. One from same tube as J. W. All these did perfectly well.

None.

Vaccinated in two places. When seen on April 11th (8th day) results were "perfect" areolæ round each vesicle, scarcely touching each other. Vesicles punctured with clean lancet; but lymph not preserved.

On April 20th child brought by mother to doctor saying she could not get vaccination marks to heal up. There was then erysipelas extending below elbow and over shoulder. Mother said it began to inflame on night of 11th, and she had been poulticing and fomenting it ever since. Erysipelas continued to spread, and after extending over abdomen, child died in 48 hours.

Doctor unable to trace any cause but fact that child was wearing a new frock, bought ready made, of a maroon colour, and unwashed.

The vaccination did well up to 8th day, when vesicles were punctured, and as signs of inflammation appeared the same day there is some likelihood of the erysipelas originating in infection of the punctured vesicles. If direct contamination at the time of puncture be excluded (and of this there is no evidence), the dress may have been responsible for the contamination of the opened vesicles.

The normal course taken by the vaccination up to the 8th day, and the successful results in the co-vaccinees prove that the specimen of calf-lymph used was pure.

[S. C.]

CASE XXIV., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated 1st June* 1889.)

J. W. R., male, age five months.

April 11th, 1889, by Public Vaccinator.

May 1st, 1889.

"Erysipelas following vaccination."

Stored tube lymph from A. H. (female) vaccinated April 1st.

(*a.*) A. H. was vaccinifer in arm-to-arm vaccination of *four* children on April 1st.

(*b.*) Stored lymph from same source used for *three* children on April 8th.

(*c.*) Stored lymph from same source used for *six* children on April 11th. All the above did well except J. W. R.

(*d.*) In following week (April 18th), *eleven* other children vaccinated (arm-to-arm) from A. J., who was vaccinated in group (*c.*) at same time as J. W. R. One of these, S. T., male, 2 months, developed slight erysipelas from wrist to shoulder on 29th (12th day), and recovered in a week under treatment. (Scarlet fever was prevalent in district.)

None.

Parents stated that, vaccinated in three places, vesicles formed at each, and were either unduly accelerated or accidentally ruptured, for it is stated they burst on 6th day. When inspected on April 18th, considerable redness and swelling of arm from elbow to shoulder. Public vaccinator "did not notice anything abnormal, "except that vesicles appeared to have been rubbed, "and there was rather a large areola," but no cause for alarm or special treatment.

Redness and swelling of arm increased, and on April 20th doctor communicated with to effect that arm was inflamed. He sent some tincture of iodine as application, and saw child on 22nd, when he found arm red from shoulder to elbow, and on 24th the erysipelas spread over body, and continued to extend till death on May 1st.

Nothing was applied to arm but what was prescribed. No vaccination shield was used.

Child said to have been healthy prior to vaccination.

Seven other children in family, all vaccinated, and in good health.

Mother says she herself is subject to erysipelas, which usually appeared when she had a cold, and that at time J. W. R. vaccinated she "was suffering from a cold in "head, and had same sensations which she had "previously had when suffering from erysipelas." One of younger children had attack of erysipelas in leg some months ago without apparent exciting cause.

House situated on a breezy hill side, was dirty and close. *General conditions.*

N. B. A table affixed to report gives information of 27 children vaccinated by Public Vaccinator during same time as J. W. R.

In this case erysipelas developed at site of vaccination within the first week. No fewer than thirteen children were vaccinated with the same lymph, nine from tubes as was this infant; and yet only the latter had an abnormal course. The vesicles seem to have matured early, and to have been accidentally ruptured on the 6th day, when it is probable the infection took place. The cause of this infection is difficult to trace, but the "dirty and "close" condition of the dwelling, and the evident family tendency to erysipelatous inflammation may have contributed to its supervention in this case. *Summary reporter's conclusion.*

[S. C.]

CASE XXV., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR. **Ac/3 (2).**

(*Report dated 3rd June* 1889).

M. B., female, age four months. *Case of.*

April 22nd, 1889, private practitioner. *Vaccination.*

May 17th, 1889. *Death.*

"Erysipelas; vaccination." *Certified cause.*

Not stated. *Source of lymph.*

Four others from same source; did well. *Co-vaccinees.*

Not stated. *Sub-vaccinees.*

Mother stated that child appeared quite well when vaccinated. On 8th day (April 29th) no redness round the vesicles. To "prevent inflammation" she began on that day to apply cream on a clean linen rag. On 10th day (May 1st) rag adhered, and could not be pulled off, so she applied a bread poultice to arm above the rag, which came off May 2nd, carrying with it the "top" of the vesicles. She then re-applied cream to the places, and continued this till May 6th, when she called in the doctor. On May 3rd infant began to vomit. *Course of vaccination.*

On May 6th the doctor found child suffering from erysipelas extending from shoulder to hand, and there was a slough at site of vaccination. The erysipelas spread gradually over body, and child died May 17th (26th day). *Course of illness.*

No cases of erysipelas or septic disease known in locality. *General conditions.*

No shield used, and mother said, so far as she knew, nothing but the rag was in contact with the vesicles. Three other children in family, æt. 6, 4, and 2; all at inspector's visit in good health. About a month before vaccination of M. B., eldest girl came home from school with "sickness, headache, and feverishness," and kept her bed over a week. Almost immediately afterwards the second girl sickened in same way, and was laid up similarly. The mother said that she herself from April 29th to May 1st felt ill, with same sort of symptoms as her children had had. She suckled the baby throughout. She added she had heard that several scholars at the village school had been ill at the same time as herself and children.

It is impossible to avoid the conclusion that the applications made to the arm by the child's mother, with a view to "prevent inflammation," were largely responsible for the production of this. The rag became adherent to the scabs, and had to be detached by poulticing, when it came away together with the scabs thus producing an open wound. The dressing of this with "cream" may also have favoured the development of erysipelas, and it is to be regretted that no doctor was called in until three days (at least) after the apparent onset of the erysipelas. *Summary of reporter's conclusion.*

Whether the state of the mother's health at the time acted deleteriously upon the infant she was suckling, so as to predispose it to the unhealthy course taken by the vaccinal sores must be left an open question.

[S. C.]

O4/0

CASE XXVI., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated 30th September* 1889.)

Case of. E. C., female, aged 13 weeks.

Vaccination. May 9th, 1889. Privately.

Death. May 24th, 1889.

Certified cause. "Erysipelas following vaccination, 7 days."

Source of lymph. Unknown. No record kept. The vaccinator has left England.

Co-vaccinees. No record of any.

Sub-vaccinees. None.

Course of vaccination. Normal. The arm was inspected on the 8th day. There were two good vesicles, which were not opened. There was not at any time any inflammation round the vesicles; and from the parent's statement no areola seems to have formed. The doctor who saw the child before its death states that "the vaccinated arm was not affected."

Course of illness. On May 18th (9th day) a "red blotch appeared on the "crown of the child's head."

May 19th. "The redness had spread to the forehead."

May 21st. The redness had spread over the face almost to the jaw.

May 23rd. Convulsions set in.

May 24th (15th day). The child died.

Previous history. Good.

Family history. Good.

General surroundings. House "clean and well kept." Sanitary condition fair. No history "of the prevalence of scarlet fever or other infectious disease."

Summary of reporter's conclusion. The child died of erysipelas, 15 days after it had been vaccinated. The details of the case are meagre, owing to the fact that no record had been kept; but there is no evidence that the erysipelas originated in or spread from the vesicles.

[T. D. A.]

B/2 (1).

CASE XXVII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.*

(*Report dated 26th July* 1889.)

Case of. M. C. P., female, aged four months.

Vaccination. April 18th, 1889, by Public Vaccinator.

Death. June 23rd, 1889.

Certified cause. "Vaccination, septic infection two months."

Source of lymph. According to the register, taken from the arm of a healthy child (S. R. 114), who had been vaccinated with calf lymph obtained from Dr. Renner. The arm said by mother to be "rather inflamed on 8th day." The subsequent course of vaccination was normal.

Note.—The accuracy of the register is doubtful; one other child (117) was vaccinated with the same calf lymph on the same day as S. R., from whom eight children were vaccinated, two of whom suffered subsequently from considerable inflammation of their arms. It is thus certain that three cases in second remove from the calf suffered from excessive inflammation round the vesicles.

Co-vaccinees. None.

Sub-vaccinees. None.

Course of vaccination. *2nd day.* Vesicles began to form.

7th day. "Some inflammation around the vesicles;" the lymph was opaque.

8th day. When inspected "a red blush around the pocks."

By *14th day* the arm was "markedly inflamed," the "redness reaching from the shoulder to the elbow, and "there was a lump in the axilla."

Subsequently the four pocks ran into one "forming "a large, deep, running sore."

Bleeding sores subsequently appeared on the sides of the head. Towards the end of the illness hæmatemesis occurred, and blood was passed by the bowel.

Note.—Notwithstanding the serious condition of the child no doctor was consulted until June 20th, eight weeks after the vaccination was inspected, and only three days before the child's death.

The vesicles were not opened, nor were they injured. Dressed by the mother with bread poultices and sweet oil.

Child "healthy before vaccination."

The eldest girl, aged 12, "suffers from chronic hip-"joint disease, with purulent discharge from sinuses."

The child was not kept clean. Mother has five children, the next youngest not then able to walk. The house is imperfectly supplied with water.

Unsatisfactory. "Lancets not in very good order;" cleanliness and disinfection imperfectly carried out. Source of lymph not accurately registered.

The child died of septicæmia originating from the vaccine vesicles. The mode of infection is uncertain. The want of cleanliness and the presence in the house of a child with discharging sinuses, were both sources of danger. It appears that the lymph used produced excess of inflammation round the vesicles in three out of nine other cases vaccinated with it.

[T. D. A.]

CASE XXVIII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated 17th July* 1889.)

D. E. T., female, aged five months.

May 14th, 1889, by Public Vaccinator.

June 21st, 1889.

"Erysipelas following vaccination from calf lymph, "convulsions."

Healthy calf, whose vaccination was reported to have been "normal in every respect."

106. All inspected on 8th day. The "usual effects of successful vaccination" only, were observed. No complaint had subsequently been made respecting any of them.

Two tubes were filled from the vesicles on 8th day, and were sent with others to Havannah. Their further history is not traceable.

Up to *11th day* (May 25th) normal.

About *11th day* mother noticed "rather more redness round the places; but no doctor was then consulted.

20th day (June 3rd), mother took the child to a surgery. The arm is reported at this time to have "presented no particularly noticeable features." It was looked on as a case of "severe vaccination which might have been irritated."

24th day (June 7th). "Unmistakeable erysipelas was present."

26th day (June 9th). Mother obtained further medical advice. Erysipelas "had extended from the hand to "the back and shoulder," and "gradually it spread "over the head and trunk, but finally disappeared "altogether."

35th day (June 18th). Cerebral symptoms supervened.

38th day (June 21st). Child became convulsed, and died.

Vesicles were opened and lymph taken from them the 8th day. No shield used. No application "except "what the doctor prescribed." Mother does not think they were rubbed or irritated.

Previous to vaccination the child was believed to have been healthy.

There is nothing in the family history to throw light upon the case.

House clean and well kept. Sanitary condition fairly good. No known case of erysipelas in house or among friends. Not knowingly exposed to infection at the surgery.

The reporter concludes that the erysipelas in this case did not commence until more than three weeks

* *This case is also amongst those brought to the notice of the Commission with a view to their investigation; being the same as that numbered as Case* 178 *on page* 363. *The case was not, however, investigated by a medical man on behalf of the Commission.*

from the time of vaccination. If however, the mother is correct, she noticed "rather more redness" about the 3rd day after the arm was inspected and the vesicles opened. Though the progress was slow, this gradually increased. On the 20th day the case was considered as "one of severe vaccination which might have been irritated," and the child was feverish. Four days later there was "unmistakeable erysipelas." From these facts it would appear that erysipelas supervened during the development of the areola, and that the child's death was primarily due to the exhaustion consequent upon it.

There is no record of any probable extraneous cause for the erysipelas.

[T. D. A.]

CASE XXIX., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated 23rd July* 1889.)

M. J. L., female, aged four months.

May 13th, 1889, by Mr. R., Public Vaccinator.

June 25th, 1889.

"Vaccination six weeks, erysipelas five weeks; "asthenia."

Mr. R., vaccinator.

Direct from arm of child W. (No. 195) on 8th day.

Said to be healthy before vaccination. Vaccination quite normal till after 8th day. Later, child suffered from spots "like little gatherings," which "became "covered with yellow crusts" and left "superficial red blotches." Arm six or eight weeks in healing. Two other children vaccinated with same lymph at same time as vaccinifer did well.

Three vaccinations, normal. Vaccinations of two other children at same time from another source, also normal.

None. Child not taken to be inspected.

8th day. A little redness round pocks.
10th day. Arm inflamed; the vesicles broke and discharged.
11th (? 18th) day. Erysipelatous inflammation, and sloughing of vaccination vesicles. Axillary glands enlarged. These subsequently subsided.
12th day. Inflammation spread across the chest and next day reached the opposite arm, axillary glands becoming temporarily enlarged.

Inflammation subsequently spread all over body, legs, and hands. An axillary "ulcer" formed, but there was no "deep suppuration." The child eventually sank from exhaustion.

Note.—Mr. R. says he was not called to see the child until May 30th (18th day), a week later than mother states.

Not rubbed or irritated. Fresh cream and bread poultices applied.

Vaccination was performed with an instrument difficult to keep clean; dried blood and hairs were found in holes of the cap. Certificate of "successful vaccination" was given before the result was known.

Stated by mother to have been previously "stout and healthy," and to have had "no illness"; but was suffering badly at time of vaccination from "thrush" of mouth and anus. Mother did not think it worth while to mention this to Dr. R.

Mother delicate. Three elder children healthy. One dead of bronchitis.

Home dirty and generally unhealthy. During course of vaccination the child was moved from this cottage, which had a defective drain close to door and an open ditch containing black and stagnant sewage about 10 feet from house. It was brought back again before death.

The child died of erysipelas. The inflammation appeared at a late date. Infection probably took place (the reporter surmises) subsequent to and not at the time of vaccination. There is no definite evidence as to its origin, but Dr. R. attributed it to the unwholesome state of the child's surroundings, and the poulticing of vaccination wounds.

[T. D. A.]

CASE XXX., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR. **Ac 0 (1).**

(*Report dated 30th October* 1889.)

Case of. J. M., female, aged three months.

Vaccination. July 6th, 1889, by Public Vaccinator.

Death. July 28th, 1889.

Certified cause. Not given.

Source of lymph. Direct from vaccinifer, E. A., female, at two months, whose vaccination normal.

Co-vaccinees. Two in number; they were not used as vaccinifers, and could not be traced; one of them had died a few weeks before report was made "from convulsions."

Sub-vaccinees. None.

Course of vaccination. Not brought for inspection. According to grandmother who took the child to be vaccinated this was done in four places on left arm, the lancet being cleansed in water before using. She did not bring child for inspection on 8th day because it was not well.

Course of illness. On 9th day the grandmother states that redness and inflammation of the arm set in, but no doctor was called till July 22nd (17th day) when there was erysipelas involving half the body and the vaccination vesicles were inflamed.

General conditions. No cases of erysipelas in neighbourhood, but scarlatina prevalent. When child brought to be vaccinated, it was wearing a red-coloured frock, which, on advice of public vaccinator, was left off.

Sanitary state of dwelling (in a yard) not good as to privy accommodation and drainage. Family cleanly and respectable. The Public Vaccinator is a careful operator, keeping instruments in proper condition.

Summary of reporter's conclusion. The case did well until the 8th day, when child sickened, and next day the arm was noticed to be inflamed; but no medical attendant called until the 17th day, when the erysipelas was widely diffused. The cause of the erysipelas is undetermined.

[S. C.]

CASE XXXI., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE MEDICAL OFFICER. **Ac 1 (1).**

(*Report dated 19th August* 1889.)

Case of. M. A. B., female, aged three months.

Vaccination. July 15th, 1889, by Dr. P., Public Vaccinator of H. Union, as a private case.

Death. July 29th, 1889.

Certified cause. Not given.

Source of lymph. Stated to be from tube sent by the partner of Dr. T., Public Vaccinator of C. C. district, on Thursday, July 4th. No record of lymph had been kept.

Note a.—Dr. T. had at this time a similar case of abnormal vaccination, in which "erysipelas super-"vened," and which ran an identical course, although the child ultimately recovered. From the arm of this child (M.) some tubes were filled on 8th day, July 1st. Dr. T. did not *think* this lymph had been used but did not know what had become of it.

Note b.—Two tubes of this batch of lymph were submitted to Dr. Klein for examination: (1) one unopened; (2) one partially used for vaccinating another infant, C., No. LXV. Both these on cultivation yielded micro-organisms.

(1.) The colonies were "staphylococcus pyogenes "albus liquescens."

(2.) "Were all streptococcus of erysipelas" and very numerous (see Case LXV.).

Co-vaccinees. One other child (S. C., Case LXV.) vaccinated from same batch of lymph. First operation, July 13th, unsuccessful. Repeated July 20th with lymph from same stock. Fatal erysipelas supervened.

Sub-vaccinees. None.

Course of vaccination and illness. *3rd day.* Arm inflamed at shoulder.

8th day. No vesicles, or redness of vaccination places. Small thin scabs only. On outer side of elbow large blister. Arm from elbow to wrist red, hard, and swollen. Subsequently inflammation spread from elbow up the arm, across chest, down the other arm. Inflam-

mation "fugitive." No deep suppuration. No enlargement of axillary glands.

12th day. Inflammation had "spread to the right leg." The previous day (July 25th), "symptoms of acute "bronchitis and diarrhœa set in."

15th day. Child died from exhaustion.

Method of vaccination. Two large insertions were made. A scarifier was used.

Sanitary surroundings. Good. Erysipelas not prevalent at the time.

Summary of reporter's conclusion. The child B.'s death was due to septic infection. Its early commencement points to the probability of the poison having been introduced at the time of vaccination. The reporter draws attention to the facts—

(*a.*) That the lymph seemed to have produced "none "of the effects of vaccine lymph."

(*b.*) That the date on which the lymph was sent to Dr. P. would allow of its being that taken from the arm of the child M., who afterwards suffered from erysipelas.

(*c.*) That the symptoms and course of illness were similar to those in the child M. and the child C.

Note.—Dr. Klein's investigation tends to confirm the belief that the lymph used for this vaccination was at fault. And it is noteworthy that the lymph taken from arm of child M. was not accounted for by Dr. T.

[T. D. A.]

Ac 2 (2).

CASE XXXII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report not dated*).

Case of. E. E., female, age, one month.

Vaccination. June 6th, 1889, by Public Vaccinator.

Death. August 13th, 1889 (three months of age).

Certified cause. "Blood-poisoning following vaccination, eight "weeks."

Source of lymph. Arm to arm, vaccinifer (vaccinated May 30th) healthy; did well and presented four good marks.

Co-vaccinees. Four. All did well, three of them seen by reporter; each had good scars.

Sub-vaccinees. Not stated.

Course of vaccination. At inspection on 8th day had "four well-formed "vesicles of normal appearance."

Course of illness. According to the father the arm became inflamed about the 12th day, but the mother said this was not till the 3rd week. It could not have been severe, for although from June 15th to 21st a medical man was attending another child in family (for fractured skull), he was not asked to see the vaccinee until his next visit on July 30th. Black scabs formed at sites of vaccination, and spreading erysipelas extended from arm to rest of body, bullæ forming as it spread; there was apparently no suppuration. The child seemed to improve but died somewhat suddenly.

General surroundings, &c. House clean, but small; only two rooms. Bedroom ill-ventilated and damp. No privy accommodation: and drain dilapidated.

Mother was much engaged in attending her other child, who had sustained a compound fracture of the skull; the parents said the discharges in this case were considerable and "offensive," and that the surrounding skin was inflamed; but the doctor stated that the discharge was slight. This child made a good recovery.

No infectious disease in neighbourhood; except parotitis in children living next door.

Family history. Of six children, four alive and healthy. E. S. was breast-fed only, and slept beside its mother.

Summary of reporter's conclusion. It is not clear whether the erysipelas commenced in the second week or at close of third week (according to the mother it was about a fortnight after the inspection). At any rate it did not assume a serious aspect until the 8th week. Its supervention may be ascribed in some measure to neglect on part of mother, whose time was taken up with attending to her other child, and it is not unlikely that the vaccination wounds were contaminated from the discharges in that case.

[S. C.]

CASE XXXIII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

Ac 2 (

(*Report dated 4th October* 1889.)

Case of. H. E., male, age three months.

Vaccination. August 19th, 1889, by Public Vaccinator.

Death. September 26th, 1889.

Certified cause. Not stated.

Source of lymph. Direct from H. A., female, vaccinated on August 12th from H. H., male, vaccinated August 5th. H. H. said to have shown extensive redness of arm four or five days after inspection (12th), and that he was vaccinated when both measles and scarlet fever prevailed at his home. Course of vaccination in H. A. regular.

Vaccinee. B. C., male. Course regular.

Co-vaccinees. None.

Sub-vaccinees.

Course of vaccination. When inspected on 8th day (August 19th) reported "four very fine vesicles, ½-inch areola, vesicles hastened." Vesicles not opened; and mother states they did not rupture subsequently.

Course of illness. According to mother, redness around vesicles continued to extend, and by August 30th (13th day) whole arm swollen; similar redness and swelling extended to other parts of the body till death.

General condition. M. E., female, æt. 11, living in same house, attacked with facial erysipelas on July 11th; in bed for a week, and confined to house for about three weeks; when removed H. E. lay on same couch as that occupied by M. E. during her illness; and the pillow had not been cleansed; it was "very foul."

Mother applied wet rags to arm of H. E. after 8th day.

House ill-kept; habits of family unclean; soiled linen and rags which had been used in case of M. E. still accumulated (and possibly used for H. E.).

Summary of reporter's conclusion. The statement that the vesicles did not rupture makes it difficult to explain the supervention of erysipelas, which apparently commenced about the 9th day. There is ample cause for the infection of the infant in the previous illness of its sister, and the uncleanly state of the domicile.

[S. C.]

CASE XXXIV., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

Ac 1 (

(*Report dated 31st October* 1889.)

Case of. M. A. H., female.

Vaccination. September 10th, 1889. Private practitioner.

Death. October 8th, 1889.

Certified cause. Not stated.

Source of lymph. Direct from another child brought to surgery. No record kept by doctor as to vaccinifer in this and other cases.

Co-vaccinees. No record.

Sub-vaccinees. No record.

Course of vaccination. Only one insertion made, this being the doctor's usual practice. No mention made of inspection on 8th day; and nothing noticed until September 22nd (12th day), when erysipelas set in, and the mother applied fuller's earth, taking child to doctor next day.

Course of illness. Erysipelas continued to extend till death.

General condition. No shield worn. No dyed material in contact with arm. Owing to father's objection to vaccination, the child taken to this doctor because he "only made one mark." But little information could be obtained from the doctor, who used an ordinary lancet, which "he cleansed every day it was used." But inspector who visited surgery on a vaccinating day did not observe any means for cleansing it between each vaccination.

The child had been out of doors since inspection. Three other children in family all of whom had been similarly vaccinated by same doctor. House in good sanitary state. Family "well to do" and cleanly in habits.

Summary of reporter's conclusion. In this case erysipelas did not begin to develop until the 12th day. The reporter draws attention to careless-

ness on part of vaccinator, but the date of appearance of the inflammation is opposed to contamination when vaccinated. The precise source of infection is undetermined.

[S. C.]

CASE XXXV., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated 9th November* 1889.)

W. A. C., male, age four months.

September 25th, 1889. Private.

October 18th, 1889.

"Vaccination; erysipelas; asthenia."

No precise information.

The vaccinator was concerned in another case reported on in April 1889 (No. XLV.), when it was ascertained that he was in the habit of vaccinating in only one place, and using a knife "resembling that used for "amputating fingers, which was not in good condi- "tion." He has continued this practice, but said he was careful to open the vesicles without drawing blood, and did not use thin or watery lymph, or lymph from arms that are red. But had seen his assistant (qualified) take lymph from inflamed arms. Reporter learnt from vaccination returns that this vaccinator had vaccinated 19 children on September 18th, 19 on September 25th, and 16 on October 2nd (but at least two others not traced. Of these 54 cases the reporter personally traced 41; and gathered from the mothers generally that lymph was taken from inflamed arms. In the 13 and 14 cases he saw which had been vaccinated on September 18th and 25th, there was no indication of abnormal course. It was impossible to trace the vaccinifer to W. A. C.

No precise information.

Although, when taken for inspection on October 2nd, the assistant said there was too much redness, he vaccinated two, if not three, children from the arm, "drawing a little blood." There were 14 children vaccinated on this date (October 2nd), including the three following, who *may* have been the sub-vaccinees to W. A. C.:—

(*a*.) Unsuccessful, followed in three or four days by papular eruption. On October 9th successful, and at date of report place healed, although a thick papular eruption on arms.

(*b*.) Unsuccessful. On October 9th successful, followed by great redness and swelling of axillary glands, which suppurated.

(*c*.) Successful (after a failure). Vaccination did not go on satisfactorily, and when seen by reporter presented raw granulating ulcer, with thin watery discharge and papular rash.

The mothers of (*a*), (*b*), and (*c*) stated that the vaccination was done from a child's arm that was inflamed, and one gave further evidence pointing to the vaccinifer as W. A. C., but this could not be distinctly proved.

On the 6th day (vaccination having been done in one place) the arm began to get red, and the place got slightly rubbed. Taken for inspection on 8th day (October 2nd), when redness over an area the size of a 5*s*. piece, yet lymph was taken from it (see above).

(The mother noticed that of other infants present some had more, some less, redness than hers.)

On 10th day child very fretful; on 11th day redness extended to elbow, and child seemed chilly. Mother wrapped it in flannel and applied camphorated oil to back. On 10th day (October 6th) she sent to doctor, when assistant told her to poultice arm, and sent medicine. She had hitherto been applying milk rag and cream to arm; no shield used.

On October 7th (13th day) the doctor visited the child and found vaccinated place covered by a light scab, redness and swelling extending to below elbow and upwards over shoulder and back. Marked prostration and pyrexia (T. 103°). Lead lotion prescribed, and next day substituted for iodine liniment. The scab came off, leaving an ulcer with flabby granulations; the erysipelas continued to extend over whole body, bronchitis and diarrhœa supervened, and death occurred on October 18th, *i.e.*, 23 days after vaccination.

General conditions. A fortnight before child vaccinated mother had suffered from a cold and sore throat, but was well in a week; the father and their only other child, æt. 3 or 4, were quite well. No evidence of exposure to infectious disease. Medical officer of health reported scarlatina as prevalent in district, but not near house. But the doctor had several cases under his care and some may have attended at his surgery at this time. Sanitary arrangements of dwelling appeared to be good.

Summary of reporter's conclusion. In this case the erysipelas probably commenced on the 6th day; and of the three sub-vaccinees, two were unsuccessful and one did not do well. The vaccinifer could not be traced, and the vaccinator did not follow the instructions of the Board.

[S. C.]

CASE XXXVI., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR. **E.**

(*Report dated 8th November* 1889.)

Case of. W. A. S., male, age four months.

Vaccination. September 30th, 1889, by Public Vaccinator (deputy).

Death. October 19th, 1889.

Certified cause. "Scarlet fever; vaccination; phlegmonous erysipe- "las."

Source of lymph. Direct from vaccinifer, whose case ran normal course.

Co-vaccinee. One, also normal.

Sub-vaccinee. One, whose arm at date of report showed "five ill- "formed, yellowish crusts, the healing of the sores "being retarded by rupture of vesicles and careless "nursing."

Course of vaccination. No inflammation at date of inspection (8th day). The sores did not heal before death.

Course of illness. On 9th day after vaccination (October 9th) a rash came out; and next day swelling in front of shoulder of vaccinated arm. October 11th, seen by doctor, who describes case as a "typical case of scarlatina and phlegmonous erysipelas." Two days before death child taken to London Hospital, and mother advised to take it to Fever Hospital, but she refused to do so.

General conditions. Had been one or two cases of scarlet fever in same row of houses about a month before, but no evidence of any communication with W. A. S. In one of the families from which a child brought to be vaccinated on October 7th there was diphtheria at the time.

Summary of reporter's conclusion. In this case the child was infected with scarlatina, probably during the week following vaccination; and the intercurrence of this disorder induced the erysipelatous condition which started from the vaccination wounds.

[S. C.]

CASE XXXVII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE DIRECTOR OF THE NATIONAL VACCINE ESTABLISHMENT. $\frac{AA^{c}}{O}$ (2).

(*Report dated 18th November* 1889.)

Case of. L. E. B., male, age not given.

Vaccination. October 8th, 1889, by Public Vaccinator.

Death. November 1st, 1889.

Certified cause. Not given. Said to have died of "erysipelas."

Source of lymph. Direct from calf.

Co-vaccinees. 86. "No compiaint from any of the cases. Seen on 8th day." Three only were *not* inspected.

Sub-vaccinees. Not stated.

Course of vaccination. On 8*th day* (October 15th), when inspected normal.

About 11*th day* (October 18) mother states arm became "excessively inflamed." On this day child was taken to an hospital.

13*th day* (October 20th) the child was seen by Dr. G., "it was then suffering from erysipelas."

25*th day* (November 1st), child died.

Treatment of vesicles. Mother applied "a white ornament" (given her at an hospital) to the inflamed vesicles. Reporter concludes this was zinc ointment. No other application made.

General surroundings. No case of erysipelas or scarlet fever in child's home.

Summary of reporter's conclusion. The reporter makes no summary.

[T. D. A.]

Ac 2 (2. V)

CASE XXXVIII., REPORTED TO LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated 11th November* 1889.)

Case of. W. R. E. W., male, aged six weeks.

Vaccination. October 17th, 1889, by Public Vaccinator.

Death. November 3rd, 1889.

Certified cause. Not stated.

Source of lymph. From arm of a child, T. E. A. (198); second remove from calf. Stored in a tube. Original lymph from Dr. Warlomont.

Vaccinifer. Healthy. Vaccination normal.

Co-vaccinees. Four. Course of vaccination in all normal.

Sub-vaccinees. None. One child vaccinated on same day at same place suffered subsequently from an inflamed arm.

Course of vaccination.
8th day. Normal. No areola.
9th day. Arm inflamed round vesicles.
11th day. Inflammation had spread to shoulder, and later to chest. It had subsided round vesicles, which were "drying up."
14th day. Inflammation extended to back, which was "purplish" and œdematous. One large crust covered the vesicles.
17th day. Inflammation subsiding, but child weaker and collapsed.
18th day. Child died from exhaustion.

Treatment of vesicles. The vesicles were punctured on 8th day; the gown, which was white, stuck to one of them, and it was ruptured.

Method of vaccination. Satisfactory in all respects.

Previous history. The child is said to have been healthy, but thin.

Family history. Mother was suffering from offensive and purulent discharge from the ear. Father out of work.

General surroundings. The child appears to have been insufficiently fed, especially during its illness, the mother having lost her milk, and too little artificial food was given in its stead. No known infectious illness in house or neighbourhood.

Sanitary conditions. Reasonably good.

Summary of reporter's conclusion. The child died of erysipelas which commenced on the 9th day during the development of the areola. The reporter suggests that the late appearance of the inflammation, and the normal course of vaccination in the four co-vaccinees, make it probable that the erysipelas had its origin from some contamination of the wounds subsequent to, and not at the time of, vaccination. He considers the purulent discharge from the mother's ear the most probable source of septic infection.

[T. D. A.]

Ac 2 (3).

CASE XXXIX., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated 19th November* 1889.)

Case of. R. A. T., female, aged 11 months.

Vaccination. September 11th, 1889, by Public Vaccinator.

Death. November 9th, 1889.

Certified cause. "Post vaccinal erysipelas; bronchitis."

Certified by. House physician, B. infirmary.

Source of lymph. From child J. S. vaccinated September 4th. Vaccination normal.

Co-vaccinees. Ten. Vaccination in all cases normal.

Sub-vaccinees. None.

Course of vaccination. Vesicles were normal on 8th day when inspected. Scabs subsequently formed and all went well for 14 days (three weeks from time of vaccination).

Course of illness. A fortnight after inspection scabs were rubbed off, wounds became inflamed shortly afterwards.

October 7th. Arm red and swollen from "shoulder to about middle of forearm." Inflammation subsequently spreading to other arm, to chest and back, and later to lower extremities, head and face.
October 14th. Bronchitis first noticed. Temp. 103·2°.
October 29th. Erysipelas subsiding, but bronchitis increasing. Small ulcers on head and back.
November 9th. Child died. All active signs of erysipelas had disappeared a week previously.

Treatment of wounds. Not opened. Scabs were rubbed off. Wounds dressed with cold cream, cream, fuller's earth, bread and milk poultices, and lead lotion.

Previous history. Child stated to have been healthy.

Family history. Good.

General surroundings. Child put out to nurse, with "dirty, slatternly old "woman, living in a filthy house."

Summary of reporter's conclusion. The child died of bronchitis, which was a complication of erysipelas starting from the vaccine vesicles. The reporter concludes that "the lymph had nothing "to do with the child's illness," and that "the attack "of erysipelas was no doubt due to the accidental re- "moval of the scabs," and "the subsequent introduc- "tion of irritating matter to the wounds."

[T. D. A.]

CASE XL., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

A 1

(*Report dated 28th November* 1889.)

Case of. L. E. E. B., female, aged seven months.

Vaccination. October 2nd, 1889, by Mr. C., an unqualified practitioner.

Date. October 26th, 1889.

Certified cause. "Phlegmonous erysipelas, 19 days (after vaccina- "tion)."

Certifier. Medical Officer of B. Dispensary.

Source of lymph. Stated by vaccinator to be "recent calf lymph," "3rd remove from calf," "from one of two children, "P. and C., vaccinated September 23rd and 24th." The first and third of these statements are incorrect, and although the children named were vaccinated on the dates given, both vaccinations were unsuccessful. Other statements of Mr. C. being proved untrue, no reliance could be placed on his evidence.
Note.—The vaccination certificate was signed by Mr. C. in the name of H. W., Mr. C. being unqualified, Mr. H. W. qualified but not registered. Eight similar cases are given. In all these the vaccination was performed and the certificate signed by Mr. C., Mr. H. W. not having in any instance seen the child.

Co-vaccinees. Not stated.
Note.—A child vaccinated on the preceding day had an inflamed arm. A "core" came away from vaccinated place and the discharge smelt unpleasant, but the child recovered well.

Sub-vaccinees. Not stated.

Course of vaccination. *7th day* (October 8th). Arm inflamed from shoulder to elbow.
8th day (October 9th). Inflammation extended to fore-arm. The hand also was swollen. The vaccinated place began to discharge. Axillary glands were enlarged, on this day the child had a fit.
10th day (October 11th). Inflammation spread to chest. Child taken to B. G. hospital. The arm was poulticed under medical advice.
16th day (October 17th). Seen by Dr. M., medical officer, B. infirmary. He found it suffering from phlegmonous erysipelas, dating, he believed from the time of vaccination.
21st day (October 22nd). An abscess broke above elbow joint. The opposite arm became "acutely inflamed."
25th day (October 26th). Child died.

Treatment of wounds. Directly after vaccination mother applied a shield. The rim had been freshly covered, but it was 14 years old and been worn by "at least 10 children." The vaccinated place was not opened. They were not irritated or rubbed.

Previous history. The child had always been delicate, and vaccination had been deferred in consequence.

Family history. Three children living, one subject to fits, one rickety and cannot walk.

Six dead. Two from convulsions, one aged five months, 14 days after vaccination; the other aged three months. Two from bronchitis, aged respectively two years and two months, and 11 months. One from debility, aged one year and eight months, and the subject of this report. Vaccination had always been a trouble.

Mother apparently healthy.

Father said to be healthy.

House somewhat dirty.

A case of "puerperal septicæmia" occurred in a neighbouring house in October, and a fatal case of "erysipelas of head and face" in a neighbouring street in November.

Vaccination in one place only. A "surgical needle" said to be used, but could not be produced.

The lymph was stored on ivory points kept in "corked test tube" unlabelled as to source. Points cleansed in soda and water and scraped, dried and used over and over again. Some very thin from long use, but no blood visible on them.

The child died of erysipelas. It was delicate, and the family history bad. The application of a shield, more especially of one frequently used, and the storage of the lymph on points repeatedly charged were obvious sources of danger. The character and surroundings of the dispensary where the vaccination was done were not such as make it likely that great care or cleanliness was exercised by the vaccinator. The incorrect statements made by Mr. C. rendered it impossible to trace the source of lymph. The child was not, as far as can be ascertained, brought into contact with any person suffering from infectious or contagious disease.

[T. D. A.]

CASE XLI., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated 24th December* 1889.)

R. A. S., male, age ?

September 30th, 1889. Private.

November 10th, 1889.

"Septicæmia and erysipelas."

Calf lymph obtained (six points) from Dr. Renner. Inquiry made as to this particular supply—satisfactory.

Two in number, both went successfully through vaccination, and at date of reporter's visit showed normal scars.

None.

Vaccinated in three places with lancet kept for purpose. Inspected on October 7th (8th day), normal and successful. Vesicles not pricked or touched. Mother stated that scabs on scars never became dry, but were always soft and moist (but *not*, she says, in consequence of applications, which were only resorted to later).

The case did well until the fourth week, when an eruption of blebs of various sizes appeared on legs and arms, coming out in crops (about 20 at a time). The mother said they had clear yellowish contents, not "matter."

On November 3rd, about a week later, doctor sent for, and found infant suffering from bronchitis and teething. Vaccine sores had not healed; scabs apparently been rubbed off, leaving rather deep red surface, without appreciable discharge. The area of redness and scars might be covered by a crown piece. The mother had been dressing the arm with cream and violet powder, but this now substituted by lead lotion. Next day an erysipelatous blush on arm and symptoms of pneumonia (T. 104). *November 8th*, redness extended, but sores not unhealthy looking. *November 10th*, convulsions; death.

Parents healthy. One other child, a boy æt. five years, healthy. Present infant healthy up to vaccination; had not worn coloured clothes.

No erysipelas in neighbourhood or among friends.

Sanitary state of dwelling good.

For 10 days at latter part of October, mother and infant had been on a visit to relations in a detached country house (all inmates healthy) and returned about five days before doctor's first visit. It was in this interval that the vesicular rash appeared. The mother knew nothing about her fellow travellers by rail.

Summary reporter's conclusion.

The nature of the vesicular (and bullous) eruption which preceded the fatal illness is obscure. The cause of the illness which terminated in pneumonia suggests septic infection, to which the reporter thinks the infant may have been exposed during its absence from home "most probably on the return journey." The erysipelas at seat of vaccination was slight in amount, and was probably secondary to such infection.

[S. C.]

CASE XLII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR. **Ab/2 (3).**

(*Report dated 21st December* 1889.)

Case of. E. P. Sex and age not given.

Vaccination. October 18th, 1889, by Public Vaccinator.

Death. November 17th, 1889.

Certified cause. "Vaccination, October 18th; septicæmia 14 days."

Source of lymph. From tube furnished by public vaccinator of neighbouring district. The vaccinifer had been vaccinated with calf lymph (Renner's) on October 2nd, and inspected October 9th, normal. It did well subsequently.

Co-vaccinees. Tubes from same vaccinifer used for vaccination of three other children, who went through vaccination.

Sub-vaccinees. None.

Course of vaccination. When inspected (October 25th) "excellent and normal vesicles." No lymph taken from them. Continued normal up to November 7th.

Course of illness. On *November 7th* (20th day) mother noticed redness about the places, which since 8th day she had been dressing with cream.

November 8th. Seen by doctor, who found at site of vaccination deep sloughing ulcers with brawny induration around, but not much swelling. Erythematous condition of skin of left arm and hand, right arm and both legs. He substituted carbolised oil for the cream.

November 12th. Parents called and reported that child was improving.

November 17th. Father called and said that during night child had been seized with difficulty of breathing. It died before doctor reached the house.

General conditions. Mother unable to give a clear account of child's illness. It had not been away from home; had not worn coloured dresses. The farm premises where they lived were low in situation; and liquid sewage lay close to the doors. Interior of house and inmates cleanly. Their three other children went through vaccination well. Mother is scrofulous (scars in neck).

Summary of reporter's conclusion. It is stated that the vaccination ran a normal course up to the 20th day, but it is noticeable that on the 21st day there were deep sloughing ulcers at the site of vaccination, which may have been caused by local irritation some days previously. The reporter attributes the fatal illness to "septic poisoning by some extraneous "source, either wholly or in part, to which an inherited "scrofulous taint may have contributed."

[S. C.]

CASE XLIII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR. **Ac/2 (3.V).**

(*Report dated 30th December* 1889.)

Case of. F. E. H., female, four months.

Vaccination. November 20th, 1889, by Public Vaccinator. Arm to arm.

Death. December 22nd, 1889.

Certified cause. "Pyæmia following vaccination; bronchitis."

Source of lymph. Vaccinifer J. D. S., male, æt. two months—normal course.

Co-vaccinees. Two others: (*a*) J. F. McI., female, æt. three months; had no bad symptoms; scabs came off naturally; showed "four good clear scars." (*b*) P. C. E., male, three months, normal course.

Sub-vaccinee. M. B. W., female, three months. At date of inspection (December 30th) had four vaccine sores with broken yellowish crusts; the vesicles rose properly in first week, and only a little redness on 8th day. Healing apparently retarded, in reporter's opinion, by careless nursing.

Course of vaccination. Child perfectly well before vaccination. Vaccinated in four places. No inflammation 8th day, and all four vesicles opened; one child vaccinated from it (M. B. W.) and two tubes charged, but no information could be obtained as to the subsequent use of these tubes. In second week scabs formed and duly detached. Child in perfect health on December 8th (19th day); the arm was quite healed. Four days later child taken ill, according to mother, with inflammation under the right arm, and its breathing was affected. The doctor to whom it was taken did not take notice of arm, but says it was suffering from "bronchitis," for which he prescribed. He did not see it again till December 21st, when he found congestion of lungs, and right arm swollen to tips of fingers (no bullæ), and glandular enlargement in axilla. "He regarded the bronchitis and lung congestion as secondary to the 'blood-poisoning' betokened by the inflamed state of the arm. But there does not appear to be any evidence that the inflamed state of the arm *preceded* the bronchitis." The reporter saw the body (December 30th) when fore-arm still red and swollen. "There was no general 'pyæmia.'"

General conditions. Dwelling old, and small. w.c. in backyard in proper working order. A defective drainpipe at back door, communicated direct with the drain.

Summary of reporter's conclusion. The case appears to be one of erysipelas spreading from the site of vaccination with secondary glandular inflammation, and the child may have been infected from the leaking drain-pipe. The inflammation of the arm was noticed (by the mother) before the doctor was called in and treated the bronchitis.

[S. C.]

Ac/O (2.V).

Case XLIV., reported to the Local Government Board by the Local Registrar.

(*Report dated 9th January* 1890.)

Case of. M. A. F., female, age five weeks. (*Note.*—Age at death, 14 days later, certified as "one month.")

Vaccination. December 4th, 1889, by Public Vaccinator. No. 233 in register; arm to arm.

Death. December 25th, 1889.

Certified cause. "Erysipelas (vaccination)."

Source of lymph. From child No. 213 in register, aged three months, who presented an "unusually plump" group of vesicles, and lymph was taken from them sufficient to vaccinate 20 children, and to charge four tubes which were sent to the National Vaccine Establishment.

Vaccinifer. Was seen by the reporter, who was told that he had gone well through his vaccination, but healing was delayed owing to detachment of scabs.

Co-vaccinees. Nineteen in number, and each of these (with one exception) was visited by reporter. However, he was informed that the one he did not see had "done beautifully." In four cases at the time of his visit there was not complete healing, *viz.*, Nos. 226, 227, 239, 232. The cause of this retarded healing could not be ascertained in No. 226, it was attributed to the "scabs being knocked off in 239," but in No. 232 the course of the vaccination was peculiar. There had been no surrounding inflammation, and up to 8th day vesicles did well; but no well-formed scabs occurred, and on January 8th, the sites appeared as three small "shallow sores covered by a thin pellicle," and "surrounded by a narrow pink zone, showing a tendency to contract and heal." Enquiry was made as to syphilitic taint, but with negative result, although the mother had a still birth two years ago. This case, No. 232, was the 12th vaccinated from No. 213, but later cases including the 20th (No. 240) showed normal healed scars.

Sub-vaccinees. None. But four tubes charged from vaccinee (No. 233) and sent to National Vaccine Establishment.

Destination of lymph. The report contains information as to the tubes charged with lymph on December 4th from vaccinifer, (No. 213), and on December 11 from vaccinee (No. 233), and co-vaccinees (Nos. 221, 222, 223, 228, 229, 230, 234, 235, 236, 237, 239, 240). Of this lymph, the four tubes from vaccinifer were rejected on account of opacity, and so were all the specimens from the co-vaccinees, except 10 out of 12 tubes from No. 235, the 9 tubes charged from 239, and the 4 tubes charged from vaccinee No. 233, were also passed. The distribution of this supply of lymph is recorded, and as regards that from No. 233 there is information of successful vaccinations from its use.

Did perfectly well up to day of inspection (December 11th), when, as stated, four tubes were charged from the vesicles.

On December 16th (13th day) the mother noticed an extension of the redness around the vesicles, and that night she thought the infant "had a fit." At first she applied some castor oil to the arm, but the same day replaced this by flour, which was continued by direction of the doctor, whom she consulted on 18th. On that day the redness of vaccinated arm extended from shoulder to elbow, but the four vesicles appeared "normal." The erysipelas continued to spread, involving the greater part of the trunk and limbs, until the child's death on the 25th. It was superficial; there was not much swelling and no suppuration: although it had apparently started from the vaccination vesicles these ran a natural course, and became covered with "healthy-looking crusts."

Parents and three children all healthy.

The infant had not been exposed to any source of infection. Its dress was a new unwashed one of light pink merino lined with calico. There was no illness known in the neighbourhood. Sanitary arrangements of house good; family cleanly.

The reporter's conclusion runs:—"I cannot attribute the erysipelas to any source coming under observation." He suggests the possibility of contamination from wearing apparel.

[S. C.]

D/

Case XLV., reported to the Local Government Board by the Registrar-General.

(*Report dated* 23*rd April* 1889.)

V. R. B., female, age four months.

October 30th, 1888? No details could be obtained. The vaccination done "in one place" with a "knife" for a charge of 6*d.* by same vaccinator as in another fatal case reported on in November 1889. (See Case XXXV.) No records are kept by him.

November 25th, 1888.

"Specific eruption of skin, sequela of vaccination 14 days."

Not known.

No information.

No information.

The arm was said to be "going on well, with no particular redness about it," by the neighbour who took the child to be inspected on the 8th day. The vaccinator certified it as "successful" on November 7th, 1888.

Of this there is very little information. The medical man who signed the certificate said he regarded the rash as syphilitic, and attributed it to the vaccination, since, he stated, the parents said the child had no eruption previous to the operation. This, however, was contrary to the evidence given by the parents to the reporter. This was their seventh child; three had died. Like two others, it was born with cleft palate, and it "had suffered from eruption almost from the time of its birth, particularly about its bottom." Moreover, the vaccinated place was certified on November 7th as doing well.

Precise cause of death does not appear from the report; and, as the reporter states, there is evidence that the child was the subject of congenital syphilis.

[S. C.]

CASE XLVI., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE REGISTRAR-GENERAL.

(*Report dated 4th April* 1889.)

B. S., female, age —?

June 11th, 1888, by Public Vaccinator.

December 2nd, 1888.

"Syphilis, five months after vaccination."

Arm to arm.

When seen by reporter was somewhat reduced by whooping cough. Showed no trace of syphilitic lesions. Had five good scars on arm. Mother delicate; never miscarried. First child died at age of one month, second living, aged three years, in good health; third is vaccinifer.

Five in number. Two had left neighbourhood and could not be traced. The three others were seen by reporter and found to present normal scars. He heard that they had passed through their vaccination well, and been in good health subsequently.

None.

Mother stated that three pocks were produced by vaccination, which went through usual course and healed up naturally.

About two months after vaccination, mother noticed rash in groins. On November 16th taken to a children's hospital, where notes state that child had been wasting for a year; was frail and feeble, and presented a rash on nates, hands and back of legs; regarded as syphilitic.

There had been two healthy children born to parents before B. S., but the mother had miscarried in her first three pregnancies, viz., at two, three, and six months respectively.

It is pointed out that the syphilis could not have been communicated at time of vaccination because no local sores were produced, and that no specific eruption appeared till two months after the vaccination.

[S. C.]

CASE XLVII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE REGISTRAR-GENERAL.

(*Report dated 30th March* 1889.)

M. M. T., female, age, four months.

January 17th, 1889, by Public Vaccinator.

March 10th, 1889.

"Vaccination two months since; wasting and convulsions."

Arm to arm.

No details given as to vaccinifer except the negative statement that the public vaccinator had not heard, nor the reporter learnt by inquiry of any irregularity in its vaccination.

Two in number. (Same remark applies to them as to vaccinifer.)

Arm inspected on 24th January and vesicles pricked. About 12th day some inflammation around vaccinated places. The family were moving house the day before, and child's arm may, the mother thought, have been injured.

Child taken to the surgery and seen by doctor's assistant, who regarded the scars as "syphilis, probably from vaccination." The arm was then inflamed, and soon an ulcer formed at site of three vesicles. No induration of tissues or enlarged glands noticed. The child had a coppery rash at that time. On February 19th, 33 days after vaccination, it was taken to a children's hospital and continued to attend to within a day or two of its death; the case was entered in the case book by the physician as "congenital syphilis; ulceration of the arm after vaccination."

The public vaccinator had not noticed any signs of syphilis at the time of vaccination, and the mother said it was then well, but she stated that it had suffered from "snuffles" soon after birth, and at the time of vaccination presented some redness about nates.

Of the four living children in family—ages ranging from 5 to 15—the reporter saw two, both unhealthy looking, and one presenting scars in neck and behind ear. Another child had died at 16 months from "consumptive brain," and there had been one still birth (six years ago) and one miscarriage three years later. *Family history.*

The fact that when seen by doctor 12 days after vaccination the infant presented a coppery rash, is held to be quite inconsistent with what is known of the course of inoculated syphilis, whilst the early history of the child, its subsequent wasting, and non-healing of the vaccination scars point to the diagnosis of congenital syphilis being the more correct. This view is strengthened by the history of the mother's pregnancies. *Summary of reporter's conclusion.*

[S. C.]

CASE XLVIII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR. Da.

(*Report dated 9th September* 1889.)

F. N., male, aged two months. *Case of.*

July 24th, 1889, by Mr. L., Public Vaccinator. *Vaccination.*

August 18th, 1889. *Death.*

"Vaccine syphilis." *Certified cause.*

Mr. M. *Certified by.*

From child S. J. C. Lymph taken 14 days previously and stored in tubes. *Source of lymph.*

Four normal scars. On August 13th there was nothing "to indicate the presence or previous existence "of any syphilitic lesion." Mrs. C., who is healthy, has one living child, who is healthy; one died from convulsions, two were still-born at full time. *Vaccinifer.*

Five. Four were seen and found to have normal scars, one could not be traced. *Co-vaccinees.*

None. The vesicles were not opened. *Sub-vaccinees*

On 8th day the pocks were normal. The arm was then poulticed. Mother says it did "not go on properly," meaning, she states, that the arm did not inflame as in her other children. *Course of vaccination.*

On 19th day Mr. L. found normal scabs with no surrounding inflammation. Mr. M., who also attended the child in its illness, states that at a later date when he saw the arm the vaccine vesicles were healthy, and were free from sore, induration, or any abnormality.

On August 8th (15th day) as the child was lying in its cradle, a boy aged two fell with his hands upon it. The mother did not think the injury serious until the evening, when she noticed the infant's left leg was swollen. Next morning Mr. M. found the child in pain with leg flexed on abdomen and the knee swollen. He suspected fracture, but could not detect one. On *August 11th*, Mr. M. being ill, the child was taken to the public dispensary, where the medical officer also examined for fracture and dislocation of hip without success. The lower leg and foot were then greatly swollen, the swelling extending considerably above the knee. Two days later two or three blebs had formed on the leg, one of which had burst leaving a sore. The right leg also had begun to swell. The child was subsequently attended at home by Mr. M. He had been delirious during his illness, and was uncertain about dates. He found blebs below the knee and on the foot, and one of a different nature on a finger. The vesicles on the legs deepened into ulcers. *Course of illness.*

By *August 15th* Mr. M. had formed the idea that the case was "vaccine syphilis," and he prescribed "grey powder" and dressed the sores with iodoform.

On *August 17th* (24th day) a hard swelling about size of an orange was discovered in the abdomen. This Mr. M. considered to be a gumma; "all the limbs "were swollen, and an ulcer had formed under the "tongue."

August 18th. The child died. No post-mortem examination was made.

Good. Five other children healthy. *Family history.*

The child was well until the accident 15 days after vaccination. The reporter "failed to find any evidence "of syphilis," and concluded that the child's illness probably resulted from serious injury upon the iliac or *Summary of reporter's conclusion.*

femoral vein, on the occasion of "the elder child falling "upon it."

[T. D. A.]

D8. CASE XLIX., REPORTED TO THE LOCAL GOVERNMENT BOARD BY LOCAL REGISTRAR.

(*Report dated* 13*th December* 1889.)

Case of. J. H. W., male, age four months.

Vaccination. September 24th, 1889, by Public Vaccinator.

Date of death. November 20th, 1889.

Certified cause. "Vaccination; syphilis; exhaustion."

Source of lymph. Arm to arm. The public vaccinator stated that vaccinifer was one of seven children, who with parents were, and had always been, quite healthy.

Co-vaccinees. Four in number. One of them could not be traced, but the other three passed normally through vaccination, and remained healthy.

Sub-vaccinees. Not stated.

Course of vaccination. Nothing abnormal when inspected on 8th day. A few "red spots" came out just after that date, but faded in a day or two.

Course of illness. Precise onset of this not stated, but three weeks before the child's death it was brought from its birth-place—a northern seaport—to the metropolis, and the doctor who attended it almost from its arrival found it in an emaciated state, suffering from aphthous stomatitis, diarrhœa, excoriation about scrotum and anus, an abscess in right buttock, and some enlarged glands beneath jaw. It continued to grow worse, and died two months after vaccination.

Family history. No history or evidence of syphilis in either parent. The mother had never had a miscarriage. Six years ago her former child died at age of 18 months.

Post-mortem inspection. The body of the infant was seen by the reporter the day after its death. It was much emaciated. There were marks of recent but normal vaccination on left arm, and no sign of ulceration. The right sub-maxillary gland was slightly enlarged. The anus was normal; the scrotum excoriated; and there were remains of a small abscess on right buttock.

Summary of reporter's conclusion. There is no information as to the health of the child prior to, or at the time of vaccination. As the reporter states, there is nothing in the case to justify a diagnosis of syphilis, either in the family history or in the condition of the child, which is entirely explained by "thrush." There is nothing to show how the infant fell into this marasmic state.

[S. C.]

O3α. CASE L., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE REGISTRAR-GENERAL.

(*Report dated* 19*th July* 1889.)

Case of. E. M., female, age not given.

Vaccination. November 14th, 1888. By Public Vaccinator.

Death. December 10th, 1888.

Certified cause. Not stated.

Certified by. Dr. C., who states "he did not mean to convey the "notion that vaccination had . . . . . anything to "do with the child's death further than that the opera-"tion did . . . . . precede death, and may have "had a debilitating influence."

Source lymph. From arm of E. B. (No. 288).

Co-vaccinees. Three. Vaccination normal in all.

Sub-vaccinees. None.

Course of vaccination. Normal when inspected on 8th day. About three days later the child seemed ill and "to waste away," and the vaccination sores discharged. Child subsequently taken to Dr. C. He states the child was "puny" and "suffering from debility," but that there was no abnormal condition or appearance of the vaccinated arm.

Treatment of vesicles. Not opened.

Child delicate from birth. Vaccination had been deferred two months owing to a "slight rash" said to have been "quite well" at time of vaccination.

One child aged 15 months had died of "wasting," unconnected with vaccination.

Reporter is unable to trace any connexion between the child's vaccination and its illness. He considers that the child being constitutionally feeble, the public vaccinator did right to vaccinate it when it was apparently well.

[T. D. A.]

CASE LI., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR. G

(*Report dated* 30*th March* 1889.)

T. W. T., male, aged nine weeks and three days.

February 7th, 1889, by Dr. W., assistant to Mr. C.

March 16th, 1889.

Not stated.

Not stated.

Stored in a tube. Mr. C. states he is careful in selecting healthy children for his source of lymph, and renews his stock from the calf after five or six removes, *but keeps no record* of its origin.

None.

None.

Normal until the 15th day. The vesicles had by this time dried up and scabs had formed. On this day some fresh spots, having "all the characteristics of vaccine vesicles," appeared in neighbourhood of original wounds. The mother applied bread and milk poultices, and simple ointment. Subsequently Mr. C. attended the child. These fresh vesicles scabbed over and dried off in about a week, but were constantly succeeded by "similar crops in increasing quantities," involving head, face, and extremities, and ultimately the mucous membrane of throat and mouth and the surface of the eyes. Two days before death the child became convulsed.

Note.—There was no sign of erysipelas, nor were there any "glandular swellings or abscesses."

Child said to be strong and healthy.

Parents healthy.

None given.

A note is added by the Medical Officer of the Local Government Board to the effect that "though the "nature of the disease is obscure, possibly it was "varicella."*

[T. D. A.]

CASE LII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated* 15*th April* 1889.)

G. T., male, aged four months.

February 18th, 1889, by Public Vaccinator.

April 4th, 1889.

"Broncho-pneumonia, following vaccination."

Mr. J. F.

From arm of child A. T. Vaccination normal.

Six. Vaccination normal in all.

Not stated.

Normal until 4th week. The arm then appeared hard, and mother poulticed it. The scabs came off, leaving four unhealed ulcers. A small abscess then formed and discharged. Mr. F., who attended the child seven days before death, states that he found "a "circle of inflammation about three inches in diameter" round the pocks. The child was wasted "to a "skeleton." During the last days of its illness it suffered from convulsions.

* *Compare Cases LVIII., CLXII., and CXCIV.—T.D.A.*

Vesicles not opened. Mother states they often got rubbed.

Unhealthy, delicate child from birth. Frequently suffered from diarrhœa. For two months before vaccination it had a cough and seemed to waste away.

Father said to be healthy. Mother suffered from inflammation and purulent discharge from eyes. Had five miscarriages. Eight children, four dead, one still-born; one died from "consumption of the bowels at six months," and one of brain mischief at 3½ years, one from convulsions at two days.

Four living, one delicate, and others said to be healthy.

"Extremely poor, dirty, and squalid."

Reporter concludes that death was due to "tubercular disease" and not in any way to vaccination.

Note.—Dr. F., who attended the child, considered that the broncho-pneumonia was due to "absorption of matter from the arm into the system."

[T. D. A.]

CASE LIII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE REGISTRAR-GENERAL.

(*Report dated 31st May* 1889.)

C. B., female, age five months.

(*a.*) April 2nd, 1889, by deputy to Public Vaccinator (unsuccessful).
(*b.*) April 9th, 1889, by deputy to Public Vaccinator (unsuccessful).
(*c.*) April 16th, 1889, by Public Vaccinator.

May 12th, 1889.

"Vaccination, scarlet fever, ulceration, exhaustion."

(*a.*) Humanised, stored in tube with glycerine, taken September 4th, 1888.
(*b.*) Humanised, stored in tube with glycerine, taken October 11th, 1888.
(*c.*) Calf lymph (Renner)

(*a.*) Eleven. All unsuccessful.
(*b.*) Twelve, including those in group (*a*). Successful in six, unsuccessful in six (not including vaccinee).
(*c.*) Six, viz., the failures in group (*b*). All successful.

Particulars are given of the course of the vaccination in each of these cases:—I. *Of the six children successfully vaccinated on* April 9th, in one (A. W.) the sores became unhealthy about the 15th or 16th, and discharged for three weeks; about the same time a child in same house was attacked with diphtheria (or malignant scarlet fever?) and died within three days. Another (A. B.) died of whooping cough, which developed about 14 days after vaccination, which was running a normal course. II. *Of the six unsuccessfully vaccinated on April 2nd and 9th, but successfully on* 16*th*, all did well except vaccinee (C. B.) and L. A. C., who developed scarlet fever on the 15th day, and the vaccination sores continued to discharge for some days. III. *The case which was unsuccessful on April 9th, but successful on the* 16*th*, had some inflammation.

None.

Normal until 13th day, when the scabs dropped off and the wounds began to discharge, coalescing to form a single ulcer. Mother applied a poultice to the part, which she afterwards dressed with "house-leek and cream."

The medical man, called in on May 2nd, found a large crateriform ulcer, with surrounding inflammation; the child vomited on that day, and on the following day a scarlet rash appeared on trunk and limbs, which lasted till May 6th. The child grew weaker and died on May 12th, the sore continuing to discharge, whilst the arm was much swollen from shoulder to elbow, and the axillary glands were enlarged.

Father died of phthisis; a former child by same father died young from hydrocephalus and tabes.

Scarlet fever and diphtheria were prevalent in the district during the latter weeks of April.

The failure in the vaccination on April 2nd and 9th ascribed to too great dilution of lymph with glycerine. In this case the vaccination wounds took an unhealthy course, probably from infection with scarlatina, which, together with whooping cough, seems to have been responsible for the irregular course of other cases. Death must therefore be ascribed to the intercurrence of scarlet fever.

[S. C.]

CASE LIV., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR. **B/2 (2).**

(*Report dated 25th June* 1889.)

Case of. H. E. W. S., age two months.

Vaccination. May 10th, 1889, by Public Vaccinator. Arm to arm.

Death. May 27th, 1889.

Certified cause. "Vaccination 15 days; pneumonia, meningitis 24 hours."

Source of lymph. Vaccinifer healthy; its vaccination satisfactory.

Vaccinifer. Showed three good cicatrices at time of inspection.

Co-vaccinees. Eight in number. All were inspected by reporter, who found that four had good cicatrices with no complications; the 5th had some secondary scabs on the vaccination sites; the 6th, and 7th had good cicatrices but were suffering from a vesicular eruption, which in one certainly, in the other, probably, was varicella; the 8th had died of measles during the vaccination, contracted from her sister, so that this infant had been taken to vaccination station direct from infected house.

Sub-vaccinees. None.

Course of vaccination. Normal up to 9th day.

Course of illness. On 9th day (May 18th) (*i.e.*, day after inspection), mother noticed redness of child's arm, which extended, and the arm became much swollen. She applied castor oil to it, and on May 20th took it to a medical man, when it was feverish and refused the breast. He found that the four vaccinated places had united to form one, discharging pus, and accompanied by deep red, brawny swelling extending to shoulder; axillary glands enlarged. An eruption of clear umbilicated vesicles observed over left mastoid process, the knuckles and palm of right hand, and on buttocks. Crepitation at bases of lungs. Continued to grow worse, and died on May 24th after vomiting and convulsions. The "vaccinated places had not ulcerated."

Family history. On both sides good. No evidence of tuberculosis.

General conditions and surroundings. Measles and varicella were prevalent in district at time of the vaccination, and an infant (a co-vaccinee) was taken for inspection on May 17th when incubating measles, whilst another of children vaccinated on May 10th subsequently caught varicella from his sister.

Summary of reporter's conclusion. The reporter considers that neither the lymph nor operative procedure, nor the sanitary condition of house, were responsible for the results of the vaccination in this case; but that these are rather to be ascribed to some idiosyncrasy in the child, or more probably to its having been infected with either varicella or measles before the day of vaccination. The long duration of the incubation periods of those diseases makes it difficult to trace a particular source of infection.

[S. C.]

CASE LV., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR. **O2.**

(*Report dated 22nd July* 1889.)

Case of. E. S. L., female, age not given.

Vaccination. June 18th, 1889, by Mr. T. W. B., partner of Mr. H. B., Public Vaccinator.

Death. June 24th, 1889.

Certified cause. "Vaccination six days, convulsions six days."

Certified by. Mr. C. O'F.

Source of lymph. From arm of child S (No. 460).

Vaccinifer. "Clean-skinned, healthy" child. Vaccination normal.

Co-vaccinees. Two, L. and R. Both "clean-skinned," healthy children. Both vaccinations normal.

Sub-vaccinees. None.

Course of vaccination. No sign of formation of vesicles.

Course of illness. Early on the day following vaccination mother found the child cold, with laboured breathing, and convulsed. This condition lasted with slight variations until death six days later.

Previous history. Good. The child, however, was fed on milk and corn-flour, the weather was hot, and the bottles were not always kept sweet, and its digestion appears to have been disturbed.

Family history. Mother healthy. Father delicate. Eight healthy children living.

Sanitary condition. Satisfactory.

Method of vaccination. Hare-lip needle used. Small ivory spatula "smooth "and polished" for rubbing on lymph; needle point was tarnished but clean.

Summary of reporter's conclusion. Reporter concludes that the child's death was due mainly, if not entirely, to improper food; and is unable to say whether or not it might be possible for the vaccination scratches to have acted as an exciting cause of the convulsions.

[T. D. A.]

OO2. CASE LVI., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated 9th October* 1889.)

Case of. V. E. E. C., female, aged three months.

Vaccination. June 10th, 1889. By Mr. S., vaccinated at mother's request at the age of six weeks.

Death. July 23rd, 1889.

Certified cause. "Thrush eight weeks; blood poisoning (vaccinia) seven weeks; exhaustion."

Certified by. Mr. W.

Source of lymph. Calf lymph, from Association for Supply of Vaccine Lymph.

Note.—The child had been previously unsuccessfully vaccinated with stored humanised lymph.

Co-vaccinees. Not stated.

Sub-vaccinees. Not stated. By inference none.

Illness. Child was suffering from thrush at the time of vaccination. After vaccination it also suffered from eczema, which, however, under treatment was almost entirely cured; the child was also much "emaciated, and died of exhaustion."

Previous history. Birth premature. One of twins. Always weakly. At birth hardly expected to live. Mother unable to suckle the child.

Family history. Father healthy. Mother had been able to take very little nourishment whilst pregnant, and was hardly expected to survive.

Summary of reporter's conclusion. Reporter concludes that vaccination had nothing to do with child's death; but that death was due to "constitutional defects." Attention is drawn to the fact that both children died in the same way, although vaccinated with different lymph. (See Case LVII.)

[T. D. A.]

O2. CASE LVII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY ONE OF THE BOARD'S INSPECTORS.

(*Report dated 9th October* 1889.)

Case of. C., male, aged 10 weeks.

Vaccination. Date not stated. By Mr. S., vaccinated at mother's request at the age of six weeks.

Death. Date not given.

Certified cause. Not stated.

Source of lymph. "Stored humanised lymph." Source not stated.

Co-vaccinees. One. Twin sister. Result unsuccessful.

Sub-vaccinees. Not stated. By inference none.

Course of vaccination. Normal. No bad symptom.

Illness. Child was suffering from thrush at time of vaccination. After vaccination it also suffered from eczema, not requiring medical treatment. The child was "unable to thrive."

Previous history. Birth premature. One of twins. Always weakly, at birth hardly expected to live. Mother unable to suckle the child.

Family history. Father healthy. Mother had been able to take very little nourishment whilst pregnant, and was hardly expected to survive.

Summary of reporter's conclusion. Reporter concludes that vaccination had nothing to do with child's death; but that death was due to "constitutional defects." Attention is drawn to the fact that both children died in the same way, although vaccinated with different lymph. (See Case LVI.)

[T. D. A.]

GG CASE LVIII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated* 10*th May* 1889.)

Case. A. T., male, aged three months.

Vaccination. March 23rd, 1880, by Dr. M. V.

Death. April 24th, 1889.

Certified cause. Not stated.

Source of lymph. Calf lymph from National Vaccine Establishment.

Co-vaccinees. Not stated; but 31 children elsewhere were vaccinated with lymph from same calf, all with normal results.

Sub-vaccinees. None.

Course of vaccination and illness. On 8th day no areola; the vesicles had broken two days previously and were discharging.

On 17th day Dr. M. V. was called in; arm then "much inflamed" vesicles covered with "yellow con-"fluent crust." The inflammation increased; fresh vesicles formed round the primary ones, with which they subsequently coalesced. Later others appeared upon the face; these were deep and contained pus, and in time scabbed over. Before death the inflammation began to subside and the arm showed signs of healing; but the child's general condition became worse, and on the 33rd day it died.

Treatment of sores. Not rubbed or injured. No shield used. No application made to them, with the exception of cold cream prescribed by Dr. M. V.

Method of vaccination. "Every possible precaution taken." Lancet "clean "and in good order."

Previous history. Good.

Family history. Parents were first cousins; "weakly looking." Father states his "flesh used to be hard to heal." Mother says she has good health. Parents had had one other child, who also died after vaccination; certified cause of death being "Pemphigus gangrenosus."

Note.—It was ascertained that vaccination followed a normal course both in the vaccinifer in this case and in the four co-vaccinees.

Sanitary condition. Fairly good.

Note.—The parents were living in another house at the time their first child, who suffered in a similar way, was vaccinated.

Summary of reporter's conclusion. Reporter concludes the disease from which this child suffered was not due to any fault in the lymph, or of the operation, but rather to some "constitutional "peculiarity," from which apparently the elder child also suffered, and which was "called into activity by "vaccination."

[T. D. A.]

B/2(1 CASE LIX., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE REGISTRAR-GENERAL.

(*Report dated* 29*th October* 1890.)

Case of. P. J. S., male, aged eight months.

Vaccination. December 19th, 1888, by public vaccinator, Mr. S.

Death. Not stated.

Certified cause. Pyæmia.

Dr. G.

Arm of child L.

Healthy, "and in every respect a proper one."

Four. Three inspected, and vaccination found to have been normal; in the fourth it was reported to have been so.

None.

On the 8th day the vesicles were very small and not inflamed. Scabs subsequently formed, which were rubbed off, leaving open sores. A month after vaccination these were deeply excavated and indolent looking. A swelling had also formed in the axilla. The arm was inflamed, and suppuration had taken place in both knee joints.

Not opened on 8th day. Scabs were rubbed off, and the sores treated with cold cream and ointment.

The child was illegitimate; it was put out to nurse, and was brought up by hand. It was puny, ill-nourished, suffered from eruptions, and had attacks of diarrhœa. In consequence of its condition vaccination had been twice postponed. A month previous to the operation the child had measles, which fact was not communicated to the vaccinator. The doctor who attended it considered it to be an unhealthy scrofulous child of low vitality.

Fairly satisfactory.

None given by the reporter. Dr. G., who signed the certificate of death, states that in his opinion "the "pyæmia was evidently the result of vaccination." The vaccinator considers that the child's death was mainly due to its previously unhealthy condition, and to the carelessness of the after treatment of the arm.

[T. D. A.]

CASE LX., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated 7th November* 1889.)

M. K., female, aged three months.

September 17th, 1889, by Medical Officer of Workhouse.

October 11th, 1889.

Not stated.

From arm of E. S., who was vaccinated on September 10th, when 11 days old, with humanized lymph taken from *normal* vesicles on arm of E. J. L. (aged seven years) on July 12th, and preserved in tubes.

Believed to be healthy. Vesicles on September 17th in every respect normal. Nothing unusual was noticed until September 21st, "when the places grew very "sore," and by September 25th bullæ had formed, which were followed by sloughing. Eventually the child did well. Neither the mother nor child showed any signs of syphilitic taint. Nothing abnormal is recorded in the case of the child from whom the vaccinifer was vaccinated.

Ten. Five primary, five re-vaccinations. All of them on September 24th, the 8th day, showed signs of "septic vaccination." The primary cases more than the re-vaccinations. All had bullæ of various sizes on the vesicles, and in one or two instances the three vesicles were included in one bulla, followed by a slough at the seat of each puncture. They all eventually recovered.

None. The vesicles were not opened.

On 5th day the vaccination appeared not to have taken. On 8th day the vesicles looked as if they had been rubbed, though every care had been taken of them; there was a little redness beyond the vesicles. By 15th day the vesicles had become inflamed, and a large bulla formed, including the three vesicles, which subsequently sloughed into one, with much loss of tissue, but no enlargement of neighbouring glands. There was little further change before the child died. After death the arm is said to have resembled a woodcut on page 104, Archives of Surgery, Vol. 1, No. 2.

Ordinary lancet, washed between each insertion at a running tap.

Child healthy, but delicate looking. "There was "nothing to contra-indicate vaccination." *Previous history.*

There were no cases of running sores in those attending on the children, and there were no cases of infectious disease in the Workhouse. *General surroundings.*

The reporter is of opinion that the lymph was at fault, and that it must have been more or less mixed with serous exudation. The vaccinator, however, does not confirm this surmise; he considers that the lymph was not watery, and he is not aware that he drained the vesicles unduly. *Summary reporter's conclusion.*

Note.—At the end of the report a question is raised "as to the propriety of using for vaccination pauper "inmates of Workhouses," seeing that the parentage of such children cannot be known.

[T. D. A.]

CASE LXI., REPORTED TO THE LOCAL GOVERNMENT BOARD BY ONE OF THE BOARD'S INSPECTORS. **E 1**

(*Report dated February* 1890.)

J. S., male, age not stated. *Case of.*

October 3rd, 1889, by Public Vaccinator, Mr. H. *Vaccination.*

November 8th, 1889. *Death.*

Whooping cough of one month's duration. *Certified cause.*

Not known. *Source of lymph.*

One. Vaccination stated to have been normal. *Co-vaccinees.*

No details given. Said to have been normal. *Course of vaccination.*

The details of this case are not recorded. A brief statement of the fact of the child's death only is given. The vaccinator's records are untrustworthy. At the time of J. S.'s vaccination he was "notoriously eccen- "tric," and later he showed signs of insanity. He is known to have neglected the ordinary precautions as to cleanliness, and exercised no discretion in the selection of the children he vaccinated. He is also known to have vaccinated children suffering from whooping-cough, diarrhœa, eczema, and hydrocephalus. At the time of the inquiry he had resigned his office of Public Vaccinator. *Summary reporter's conclusion.*

(*See Case LXVI.*)

[T. D. A.]

CASE LXII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE REGISTRAR-GENERAL. **Ac 2** (2).

(*Report dated 4th December* 1888.)*

C. M. W., female, age five months. *Case of.*

September 25th, 1888. Private vaccination by Public Vaccinator. *Vaccination.*

November 19th, 1888. *Death.*

"Diffused cellulitis." *Certified cause.*

Vaccinifer vaccinated with humanised lymph obtained from Messrs. Richardson, Leicester, agent for the Association for the Supply of Pure Lymph, 12, Pall Mall East. *Source of lymph.*

From this case lymph was taken on 8th day, stored in new tube, and used on same day. Areola at the time half to three-quarters of an inch. Subsequently vaccination proceeded normally.

Note.—Two other children were vaccinated at same time as vaccinifer with same lymph. In one vaccination was abortive. In the other vesicles ruptured.

None. *Co-vaccinees.*

None. *Sub-vaccinees.*

On 7th day (October 1st) vesicles were ruptured and discharging. Areola three-quarters of an inch. Lymph was taken and stored in four tubes, but subsequently destroyed. *On 8th day* vesicles discharging. No incrustation. Areola 1½ inches. *Course of vaccinatio*

Subsequent dates are indefinite. Redness spread to extremities. Later there was œdema of hands and feet. About November 9th, *45th day*, abscesses formed near each elbow and on back. *55th day*, no amelioration of symptoms; child died.

No definite injury occurred to vesicles. No injurious application was made to them, and no dressing applied until they showed signs of abnormal inflammation. *Treatment of vesicles.*

* *This report is printed in full in the Appendix to the Commission's Fourth Report, pages 489-91.*

Bread poultices and lotion of Condy's fluid were subsequently applied by doctor's orders. Mother also used zinc ointment.

General surroundings. House reported unclean. Children not clean. Surroundings of house unwholesome. A fowl run in filthy condition adjoining the house. An ashpit and privy at end of the yard, both in extremely insanitary condition. A piggery and yard "with pools of black filthy fluid"; manure and pigwash in decomposing condition in rear, all giving rise to offensive smells. A cesspool with a broken cover in a neighbouring yard. In addition to these nuisances, towards the end of October a cesspool next door but one, having become full and offensive, was drained, for which purpose the drain in the common yard was opened.

Summary of reporter's conclusion. The reporter concludes that the erysipelas which appeared about the 8th day may well have been due to the insanitary surroundings of the house in which the child lived, and that they were sufficient to account for the infection of any open wound.

He further states that the unhealthy condition of the neighbourhood is testified by the fact that the vaccinator had attended fully 100 cases of enteric fever in the same district during the year; and two recent cases of illness in the same cottages, which were attributed by him to their insanitary condition.

It is noted that the lymph used in the original vaccinations proved unsatisfactory in two out of three cases, and that the vaccinator acted contrary to instructions in vaccinating as he did with lymph from vesicles with a marked areola (*see* Board's Instructions, No. 7).

Note.—There is no record of the result in other cases vaccinated from the remainder of the same batch of lymph.

[T. D. A.]

O5/2

CASE LXIII., REPORTED TO THE LOCAL GOVERNMENT BOARD "BY M. G. IN THE 'ECHO.'"

(*Report dated 29th March* 1889.)

Case of. E. M. H., female, age six months.

Vaccination. January 15th, 1889, by Public Vaccinator. Four insertions.

Death. February 16th, 1889.

Certified cause. "Strumous diathesis; bronchitis."

Source of lymph. From tube charged same morning from arm of L. B. vaccinated January 8th.

(*a.*) L. B. healthy, did well, but his mother said he had a little inflammation of the arm "after the matter was taken away," but this soon passed off.

Co-vaccinee. (*b.*) One child vaccinated direct from L. B. did well.

Sub-vaccinee. (*c.*) One child vaccinated direct from E. M. H. on 22nd did well.

(*a.*) (*b.*) (*c.*) had well foveated scars when seen by inspector.

Course of vaccination. When brought for inspection on 8th day (January 22nd) the mother thinks there was a slight redness around the vesicles. A few days later arm became more inflamed, from shoulder nearly to elbow, and large crust formed over the four places.

Course of illness. On January 25th child brought to doctor for advice as to genitals. He found severe vulvitis with several ulcerated sloughy patches, yielding copious discharge. (Mother stated that it suffered from this more or less since birth, but of late it had become worse.) The arm "appeared somewhat inflamed." The mother had protected it with a shield of wire covered with old linen, renewed daily; but doctor advised her to leave the arm alone. On January 30th arm still inflamed; large crust and oozing of pus from one corner. Vulvitis still present but improved by February 13th and arm also better, the scab having been detached by poulticing, redness almost gone. Acute bronchitis developed on 14th, and child died on 16th. The vulvitis was regarded by doctor as of "strumous" nature.

Family history. Mother delicate, often ailing, for some time after birth of E. M. H. she suffered from a "septic" discharge from uterus, and 18 months before this child was born she had a miscarriage. Father healthy. Eldest child, age five years, healthy; next died at 10 months from congestion of lungs.

Summary reporter's conclusion. The comparatively slight amount of erysipelas which developed towards the end of the first week can hardly be alleged to have contributed to the child's death, which was caused by acute bronchitis. At the same time the state of the child's health, and particularly the fact of its suffering from vulvitis, would doubtless have led to the postponement of the operation had it been known to the vaccinator. For not only is it likely that the constitutional disturbance excited by vaccination aggravated the vulvar disorder, but the existence of the latter and the need for its being attended to by the mother afforded opportunity for contamination of the arm. The co-existence of these inflammatory troubles doubtless predisposed the infant to bronchitis from slight exposure, and contributed to the fatal issue.

[S. C.]

E.

CASE LXIV., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated 19th February* 1889.)

Case of. E. M. H., female, age five months.

Vaccination. January 17th, 1889, by Public Vaccinator. Four insertions.

Death. February 12th 1889.

Certified cause. "Bronchitis seven days; erysipelas of arm four days; convulsions two hours."

Source of lymph. Direct from arm of neighbour's child, which ran normal course.

Co-vaccinee. One from same vaccinifer (direct), normal course.

Sub-vaccinee. None.

Course of vaccination. Reported to be "good" when taken for inspection on 8th day; vesicles not touched; mother did not see more inflammation than on other children. Crusts formed and progressed satisfactorily till February 5th.

Course of illness. On February 5th child developed bronchitis, and next day mother noticed a patch of redness on shoulder, which disappeared by following morning, when another patch appeared on fore-arm and extended gradually to wrist. This described by doctor, who was called in on February 7th as a "slight erysipelatous patch on left fore-arm," which disappeared above as it crept below. The vaccine vesicles appeared normal, and were free from surrounding redness. No axillary swelling. Child attacked with convulsions on the 11th, which recurred at intervals until death on 12th (lasting 24 hours, *not* two as stated in certificate). The redness had almost gone before death.

Mother said sleeves did not irritate arm; nor did any foreign matter, so far as she knew, come in contact with the vesicles.

General conditions. Child was put into short clothes for first time on February 3rd.

House close, ill-ventilated; high wall at four feet from back door.

Mother had a sore throat a week before baby fell ill; and father was suffering from ulcerated leg and swollen knee; the leg had been bad for five years and required daily dressing. The infant slept in same bed as parents.

Family history. Mother delicate. Of four other children two dead; one from croup at five years and five months; other from bronchitis and convulsions at two years nine months. The two surviving, at three and five, puny, pale, one ricketty, other suffering from chronic bronchitis, and both still unvaccinated.

Summary of reporter's conclusion. The child's death was mainly due to bronchitis from exposure. There is sufficient to account for the development of the slight degree of erysipelas that appeared on the arm in the surroundings of the child.

[S. C.]

A

1

CASE LXV., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated* 19*th August* 1889.)

Case of. S. C., female, aged three months.

Vaccination. July 13th, 1889. Repeated July 20th, 1889, by Dr. P., Public Vaccinator of H. Union.

Death. August 10th, 1889.

"Erysipelatous inflammation, marasmus, exhaustion."

Dr. P., vaccinator.

No written record. Believed to be from tubes sent by the partner of Dr. T., Public Vaccinator for C. C. district, on Thursday, July 4th. No record of lymph sent had been kept.

Note (*a*).—Dr. T. had at this time a similar case of abnormal vaccination in which "erysipelas supervened," and which ran a similar course to that of S. C. and M. A. B. (Case XXXI.), although the child ultimately recovered. From the arm of this child (M.) some tubes were filled on 8th day, July 1st. Dr. T. did not *think* this lymph had been used, but did not know what had become of it.

Note (*b*).—Two tubes of this lymph used by Dr. P. were submitted to Dr. Klein for examination: (1) one unopened; (2) one partially used, it was *believed*, for vaccinating the child S. C. the second time. Both these on cultivation yielded micro-organisms:—

(1.) The colonies were all "staphylococcus pyogenes albus liquescens." The original lymph produced no inflammation in the case of rabbits.

(2.) "Were all streptococcus of erysipelas" and very numerous. Inflammation was produced in rabbit's ear by inoculation with the original lymph, and with sub-cultures of the micro-organism.

One other child (M. A. B., Case XXXI.) vaccinated with same batch of lymph. Fatal erysipelas intervened.

None.

First operation July 13th, unsuccessful. Vaccination repeated July 20th. Two insertions. One failed. One produced "superficial inactive sore." Soon after vaccination the arm became red, swollen and hard, by the 4th day inflammation had reached elbow. Subsequently it spread to hand and fingers, across the chest, to right arm and hand with "marked œdema," finally to right leg and left leg. Several blisters formed. On August 10th (22nd day) child died.

Healthy.

Good. Erysipelas not prevalent at the time.

The child S. C.'s death was due to septic inflammation. Its early commencement points to the probability of the poison having been introduced at the time of vaccination. The reporter draws attention to the facts—

(*a*.) That the lymph seemed to have produced "none of the effects of vaccine lymph."

(*b*.) That the date on which the lymph was sent to Dr. P. would allow of its being that taken from the arm of the child M. who afterwards suffered from erysipelas.

(*c*.) That the symptoms and course of illness were similar to those in the child M. and the child C.

Note.—Dr. Klein's investigation tends to confirm the belief that the lymph used for this vaccination was at fault. And it is noteworthy that the lymph taken from the arm of the child M. was not accounted for by Dr. T.

[T. D. A.]

Case LXVI., reported to the Local Government Board by one of the Board's Inspectors.

(*Report dated February* 1890.)

C. J., female, age not stated.

October 10th, 1889, by Public Vaccinator.

October 22nd, 1889.

"Catarrh of some weeks' duration."

Mr. H., the vaccinator.

Unknown.

Eighteen children were vaccinated on the same day. All did well except C. J. and A. A. In the latter case a little surrounding inflammation was noticed on the 8th day, when the vesicles were opened. A month after abscesses formed on parietal region and near the hip, discharging much pus. By January 16th the child was beginning to rally. There were four glazed scars at the points of inoculation.

Course of vaccination. No details given. The vesicles were said by mother to have "scarcely risen."

Previous history. At the time of vaccination the child was very ill, "reduced almost to a skeleton by persistent diarrhœa." It was said also to have had whooping cough and an eruption on its scalp.

Summary of reporter's conclusion. The vaccinator was 80 years of age. He was notoriously eccentric, and later he showed signs of definite insanity. He habitually neglected the necessary precautions as to cleanliness, and is known to have vaccinated sickly children, and those suffering from whooping cough, diarrhœa, eczema and hydrocephalus. His records are quite untrustworthy. At the time of the inquiry he had resigned his position as public vaccinator. Vaccination was improperly performed when the child was ill and emaciated. It died of diarrhœa 12 days after the operation. No summary is given by the reporter.

(*See Case LXI.*) [T. D. A.]

Case LXVII., reported to the Local Government Board by the Local Registrar. Ac/2 (4.V)

(*Report dated 29th October* 1889.)

Case of. M. L., male, aged three months.

Vaccination. September 2nd, 1889, by Public Vaccinator.

Death. October 6th, 1889.

Certified cause. "Erysipelas."

Source of lymph. Direct from arm of A. J.

Vaccinifer. Vaccination favourable. Scars normal.

Co-vaccinees. Four. Vaccination normal in each case.

Sub-vaccinees. None.

Course of vaccination. Nothing abnormal was noticed for three weeks, by which time the scabs had fallen off spontaneously. Two days after, redness appeared about the elbow. The scars were then shallow, red, and not discharging. On the 26th day there was increased redness and swelling of the elbow, not, however, reaching to the cicatrices. From this date erysipelas spread over trunk and limbs without sloughing or abscesses.

Treatment of vesicles. Opened on 8th day; no lymph taken. They were not rubbed or irritated. Scabs fell off at end of three weeks; linseed meal poultices were then applied.

General surroundings. The yard in rear of house was filthy, and the ground sodden with wet. The sink pipe was broken and the drain inlet a perpetual source of bad smells. It is not known that the child was brought into contact with erysipelas or any infectious disease.

Summary of reporter's conclusion. The reporter considers it to be conclusively shown that the late erysipelas from which the child died had no causal relation to vaccination, and if traumatic was probably due to the insanitary condition of the house.

[T. D. A.]

Case LXVIII., reported to the Local Government Board by the Registrar-General. Ac/3

(*Report dated August* 1889.)

Case of. A. P., male, age seven months (five months at date of vaccination).

Vaccination October 8th, 1888, by Public Vaccinator.

Date of death. December 2nd, 1888.

Certified cause "Septicæmia."

Source of lymph. "Stored" lymph, from child at nine weeks, vaccinated April 16th, 1888.

Vaccinifer. A perfectly healthy child, with typical vaccination scars.

Co-vaccinees. Two children vaccinated direct from vaccinifer on April 23rd, reported to have done well and to be quite healthy. On October 8th in two children vaccinated

at same time as A.P., and "probably from same lymph," the vaccination was unsuccessful. They were in good health and were successfully vaccinated a fortnight later.

Sub-vaccinees. None.

Course of vaccination. According to mother; A. P. in fair health at time of vaccination, but at the age of two to three months suffered from bronchitis, and was "delicate." The vesicles rose, but on day of inspection had got rubbed.

Course of illness. Inflammation started from the injured vesicle, spread down the arm, and about three weeks after vaccination, across chest to opposite arm; bullæ formed over reddened parts. The vaccination sores did not heal. Case regarded as one of general cutaneous erysipelas, resulting in septicæmia.

Mode of vaccination. By lancet, kept in good condition; according to regulations. Lymph stored and source recorded. Room in which vaccination performed airy.

Dwellings and surroundings. A small cottage with two bed-rooms, fairly clean. Drainage defective. No infectious disease in neighbourhood.

Family. Parents and seven children. At time of vaccination, mother disabled by a sore on foot, which was inflamed and swollen. The nursing of child devolved upon one of the elder children, who took it to the vaccinator. The infant was hand-fed.

Summary of reporter's conclusion. The case appears to be one of erysipelas, at first limited to vicinity of an injured vesicle, subsequently spreading over the body. The origin of the erysipelas was ascribed to the defective sanitary state of the dwelling.

[S. C.]

Ac 1 (1). CASE LXIX., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated 27th November* 1889.)

Case of. A. C. E. le B., female, aged six months.

Vaccination. May 21st (? 28th), at a dispensary by Dr. S.

Death. June 6th, 1889.

Certified cause. "Abrasion of arm; irritation; erysipelas 10 days."

Source of lymph. Not known.

Vaccinifer. Not known.

Co-vaccinees. Not known.

Course of vaccination. Vesicles did not rise properly. On the 4th day there was severe inflammation of the right (the unvaccinated) arm, and blisters formed on the inside of the arm. Three or four days later unmistakeable erysipelas appeared, and gradually spread over the whole body. The vesicles did not heal and the child gradually died of exhaustion.

Method of vaccination. According to Mrs. B., vaccination was performed under most unwholesome conditions, the room being crowded and offensive; 20 or 30 patients were present, some of whom had suppurating sores on their faces.

Note.—The facts of this case are necessarily uncertain. The doctor who owns, and is *nominally* responsible for, the dispensary keeps no records, and the address of Mr. C., who vaccinated the child and gave the certificate of death, is said not to be known. The date of vaccination is stated by Mrs. B. to have been May 28th. It is assumed to have been May 21st, by reporter on the ground that the vaccination certificate was signed May 28th, and that Mr. C. began to attend the child for erysipelas on the 29th.

Previous history. Good.

Family history. Good.

Summary of reporter's conclusion. The child died of erysipelas, which made its first appearance on the unvaccinated arm, as far as can be ascertained, on the fourth day. The reporter considers that foul air at the dispensary and drain effluvia about the house may have been elements in the cause of the disease.

[T. D. A.]

CASE LXX., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR. **B 2 (**

(*Report dated 9th January* 1890.)

H. E. H., female, aged six months.

February 11th, 1889. Private, by Dr. M.

June 26th, 1889.

"Pyæmia; exhaustion."

Not stated. Stored in tubes since previous October.

Not stated.

Not stated.

One. Vaccination normal.

On 8th day the vesicles were small with no surrounding inflammation. During the second week the child's health failed, a small abscess forming under the chin and another on the neck. Subsequently abscesses formed on the left ankle, the right shoulder and back. The vesicles did not heal. They scabbed over for a day or two and then broke down again, finally coalescing into one large sore.

The father is a knacker.

The house and all the family were dirty.

The reporter considers that there was "nothing in "the operation of vaccination or in the course of the "vaccine disease to which this septic illness could be "attributed," and that the good results obtained in the sub-vaccinee show that the lymph taken from the child's arm on the 8th day was free from septic taint, and he therefore assumes that the mischief must have arisen from some septic inoculation subsequent to that date, and he points out that the conditions for such infection were not wanting in the child's home.

Note.—The source of lymph was not known, and no facts are given respecting the vaccinifer. Although the conditions of the child's home were such as to suggest themselves as a probable source of infection, the evidence is insufficient to prove this.

[T. D. A.]

CASE LXXI., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR. **Ac 0 (**

(*Report dated 10th April* 1889.)

M. A. B., female, aged five months.

January 24th, 1889. Private.

February 21st, 1889.

"Lymphadenitis and abscess; exhaustion."

Two tubes obtained from Dr. W. It is not known which was used for this vaccination, nor is the source of the lymph stated, but it is believed to have been humanized.

Number not stated. Dr. W. says he has not heard any other complaints, one child vaccinated at same time as M. A. B., but presumably with different lymph did well.

None.

On the 8th day there were three good vesicles, but the areola extended from one to another.

On the 13th, the vesicles have "scabbed and dried "off," but inflammation extended to the shoulder. The axillary glands were enlarged, the inflammation subsequently extended to the pectoral region (where an abscess had formed by the 24th day), and eventually became more diffused. The child died on the 29th day.

Satisfactory.

There is nothing in the child's previous history or family history, or in its general surroundings to throw light on the origin of the erysipelas. Two cases of measles had occurred in the child's home two months previously, in consequence of which its vaccination had been postponed.

The child's death was due to erysipelas commencing in the first week, but whether due to the quality of the lymph or to infection of the vaccination wounds, the reporter considers open to doubt.

[T. D. A.]

CASE LXXII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated 28th March* 1889.)

C. T., female, aged three months.

January 16th, 1889, by Public Vaccinator.

March 17th, 1889.

"Ulceration of the arm; exhaustion 11 weeks."

Direct from arm of child S. W.

Fine healthy child. Vaccination pursued a normal course.

Four. Of these, two could not be traced, in the other two vaccination was normal. One of these died of "convulsions" on February 26th, the vesicles at the time of death being, however, completely healed.

Not stated.

Three weeks after vaccination there was inflammation round the scabs, "the skin near the scabs was undermined, and there were three discharging sinuses," and a swelling in the axilla. The child gradually emaciated and died without improvement in the condition of the arm.

Seven years previously, father had had a chancre, followed by eruption.

Extremely poor.

The reporter concludes that the want of "reparative "power in the vaccinated arm and the gradual wasting "away, were due to the child's congenital syphilis," that the vaccination was performed with care, and that the lymph seemed to be "above the slightest suspicion." The public vaccinator states that he saw nothing in the child to suggest that it was the subject of inherited disease."

[T. D. A.]

CASE LXXIII., REFERRED TO THE LOCAL GOVERNMENT BOARD BY THE CHAIRMAN OF THE ROYAL COMMISSION ON VACCINATION.*

(*Report dated 6th October* 1889.)

S. R. Mc.C., male, aged five months.

July 17th, 1889, by private practitioner.

July 28th, 1889.

"Meningitis four days; exhaustion."

Dr. Renner's calf lymph.

A new darning needle.

Enquiry from Dr. Renner elicited the fact that there had been no complaints from others using lymph from same source.

None.

Three vesicles, rose normally, and were natural on 8th day.

In evening of October 24th (8th day) child became restless, tossing its arm as if in pain, and towards morning the mother noticed that its "eyes were crossed," and it appeared to be unconscious. Seen by medical man (the vaccinator) on 25th, who did not at first attach much importance to the squint. Another medical man called in on 26th diagnosed meningitis, which was confirmed by the first doctor, who again saw the child on the 27th. On the 26th the child was insensible, had retraction of head, and constipation. The vesicles looked healthy and there was "even less than the average amount of inflammation." There was no post-mortem examination.

Parents healthy, mother of nervous disposition. Some of her near relations had died of phthisis. She had a miscarriage in February 1888, and this was the first living child. It was healthy and well nourished, was fed on cow's milk, and had not been exposed to any chill.

Death was due to meningitis arising on 8th day of vaccination, and running a very rapid course. The lack of post-mortem examination prevents a definite opinion as to its being tubercular or not; but, although the family history is suggestive of tubercle, the child's previous health and the absence of any other signs, and its early age, are opposed to this origin. The reporter could only find one authority (Hugenin) stating the occasional supervention of meningitis (which he suggests may be "metastatic") on vaccinia. But he says that in the absence of post-mortem examination, no certainty as to the exact nature of the fatal illness can be arrived at; there is no positive evidence of its dependence upon vaccination, nor any reason to suppose there was any connexion between them.

[S. C.]

* *This case is also amongst those brought to the notice of the Commission with a view to their investigation; being the same as that numbered as Case 2 on page 215. The case was not, however, investigated by a medical man on behalf of the Commission.*

CASE LXXIV., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE DIRECTOR OF THE NATIONAL VACCINE ESTABLISHMENT. **OO (2.)**

(*Report dated 18th November* 1889.)

C. F., male, aged 15 days. — *Case of.*

October 22nd, 1889. — *Vaccination.*

November 10th, 1889. — *Death.*

"Death from natural causes." — *Verdict of coroner's jury.*

Direct from calf. — *Source of lymph.*

Not stated. — *Co-vaccinees.*

Not stated. — *Sub-vaccinees.*

The course of the vaccination appears to have been "normal throughout." — *Course of vaccination*

When inspected after death, November 14th, "arm "was normal"; "no œdema"; "no enlargement of "axillary glands."

On November 9th child was "taken in convulsions." It was seen and prescribed for at a dispensary. Death took place the following day. — *Course of illness.*

The father "had been subject to fits of some kind in "his early life." — *Family history.*

The reporter gives no summary. — *Summary of reporter's conclusion.*

[T. D. A.]

CASE LXXV., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE REGISTRAR-GENERAL. **GG.**

(*Report dated 22nd June* 1889.)

A. R. T., male, aged four months. — *Case of.*

(*a.*) August 31st, 1888; (*b.*) September 7th. Private. — *Vaccination.*

November 12th, 1888. — *Death.*

"Blood-poisoning two months. Certified thus because "the doctor did not know to what else to ascribe the "child's death." — *Certified cause.*

(*a.*) Calf lymph. (*b.*) Fresh calf lymph from Dr. W. — *Source of lymph.*

Not stated. — *Co-vaccinees.*

None. — *Sub-vaccinees.*

The first operation seemed unsuccessful; on September 7th the child was therefore revaccinated, and vesicles subsequently formed at both points of inoculation. On September 14th the vesicles were "rather advanced." Two days later inflammation extended from elbow to shoulder. Later the arm appeared to have "quite recovered." — *Course of vaccination.*

On September 25th, 18 days after the second vaccination, bronchial catarrh commenced, and a shotty, papular eruption appeared on the body, with ulcers in the mouth. The constitutional symptoms were not marked. There was no pyrexia, and no local formation of pus. By November 6th the catarrh had completely subsided. There was, however, little alteration in the child's condition until on November 12th (the 74th day) when the child died "apparently of inanition." — *Course of illness.*

Rose needles were used. — *Method of vaccination*

Nothing of importance ascertained. — *Previous history.*

The same. — *Family history.*

The reporter could see nothing to lead him to attach suspicion to vaccination as the cause of the child's illness and death, and he "could find no symptoms of "septic poisoning." — *Summary of reporter's conclusion.*

Note.—"Neither the vaccinator nor the well-known "physician who saw the case in consultation with him

" were able to make out the precise nature of this case." Compare Case LI.

[T. D. A.]

E. CASE LXXVI., REPORTED TO THE LOCAL GOVERNMENT BOARD BY MR. YOUNG.

(*Report dated* 15*th November* 1888.)

Case of. A. P., female, aged 2½, sister of E. P., Case LXXVII.

Vaccination. October 9th, 1888, by *locum tenens* of Medical Officer of Workhouse.

Death. November 11th, 1888.

Certified cause. "Measles; ulcerative stomatitis."

Verdict of coroner's jury. That deceased "died from stomatitis when suffering "from measles, and that death was accelerated by "vaccination which took place eight days before the "attack of measles."

Source of lymph. Taken on September 22nd from arm of child J. M., (aged 15 days), stored in tubes and used 10 days afterwards. The child could not be traced.

Co-vaccinees. 1. E. P., who died November 16th, 1888, Case LXXVII., 2. B. C., who sickened with measles eight days after vaccination (October 17th), but the development of the vesicles proceeded normally and without complication, and she eventually recovered.

Course of vaccination. Normal until the child contracted measles, for which it was removed to the infirmary on November 1st, the 24th day after vaccination. Subsequently the vesicles "took on an unhealthy action, but did not coalesce." Death occurred 10 days later, 34 days after vaccination.

Summary of reporter's conclusion. The weight of evidence is against the statement made in the verdict given above, "that vaccination took "place eight days before the attack of measles." According to the Workhouse register it took place 23 days before the measles appeared. It seems that the child's death resulted from an accidental intercurrent disorder coming on before the vesicles had completely healed, and in this case not capable of being foreseen and prevented. How far the previous disturbance to health, due to vaccination, aggravated the disease it is not possible to decide; but during its course the vesicles which had previously been healthy "took on an unhealthy action" although they did not coalesce.

[T. D. A.]

E CASE LXXVII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY MR. YOUNG.

(*Report dated* 15*th November* 1888.)

Case of. E. P., female, age 1¼, sister of A. P., Case LXXVI.

Vaccination. October 9th, 1888, by *locum tenens* of Medical Officer of Workhouse.

Death. November 16th, 1888.

Certified cause. Not certified. An inquest was held.

Verdict of coroner's jury. That deceased "died from stomatitis when suffering "from measles, and that death was accelerated by "vaccination, which took place eight days before the "attack of measles."

Source of lymph. Taken on September 22nd from arm of child J. M. (aged 15 days) stored in tubes, and used 10 days afterwards. The child could not be traced.

Co-vaccinees. 1. A. P., who died November 11th, 1888, (Case LXXVI.). 2. B. C., who sickened with measles eight days after vaccination (October 17th), but the development of the vesicles proceeded normally and without complication, and the child eventually recovered.

Course of vaccination. Normal until the child contracted measles, for which it was removed to the infirmary on November 2nd, the 25*th day* after vaccination. Subsequently, on November 14th, the 37*th day*, the vesicles had coalesced, forming a large ulcer, excavated to the depth of about one eighth of an inch.

Course of illness. The child's illness was complicated by much catarrh of the respiratory passages, running discharge from eyes, and sores behind the ears and about the face. It terminated fatally November 16th, 39 days after vaccination.

Summary of reporter's conclusion. The weight of evidence is against the statement made in the verdict given above, "the vaccination "took place eight days before the attack of measles." According to the workhouse register it took place 24 days before the measles appeared. It seems that the child's death resulted from an accidental intercurrent disorder in no way related to vaccination, and in this case not capable of being foreseen and prevented. How far the previous disturbance to health due to vaccination aggravated the disease it is not possible to decide, but during its course the vesicles, which had previously been healthy, extended and coalesced.

[T. D. A.]

CASES LXXVIII. AND LXXIX., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR. **B 2.**

(*Reports dated* 4*th May* 1889.)

Case of. (*a.*) A. J. P., male, age two months (No. 236 in register).

(*b.*) E. F. D., male, age three months (No. 234 in register).

Vaccination. Both infants vaccinated on March 23rd: (*a*) at surgery, (*b*) at home.

Death. (*a.*) April 12th, 1889.
(*b.*) April 17th, 1889.

Certified cause. (*a.*) "Convulsions; pyæmia."
(*b.*) "Pyæmia; exhaustion."

Source of lymph. Arm of one (No. 226) of four children vaccinated on March 17th, with lymph contained in two tubes received from N. V. E. All these cases did well, but although vaccinated in four places, only one vesicle formed in three, and of the four vesicles which No. 226 had, two had burst when inspected (i.e., when lymph was taken).

Co-vaccinees. Six others vaccinated with lymph obtained from No. 226. Of these, in two, vesicles were broken at inspection on 8th day, and in them (229) and (230), the areola became marked, one (230) developing an axillary abscess. Lymph taken for 17 vaccinations on April 1st from two of this series (231) and 235). Details of this group and of vaccinations on April 8th, 11 in number, from lymph derived from (237), (239), (245), and (248) are given.

In these several series of vaccinations, viz., four on March 17th, eight on March 25th, 17 on April 1st, and 11 on April 8th—a total of 40—the vaccination ran a normal course in 28, and an abnormal course in 12.

General conditions. Scarlet fever had prevailed in the district since January, and in April it assumed epidemic proportions, so that between April 12th and 17th, 11 children were attacked and sent to hospital, and the school was closed. Inquiry showed that of the infants vaccinated in the above series, those in whose homes scarlet fever had occurred or was present at the time ran an "abnormal" course, but that those not so exposed were normal; except in two cases where the vaccination was normal although scarlet fever was present in their households, and in one of the "abnormal" cases the scarlet fever was in a neighbour's house and not in that of the vaccinee. In only two cases was the vaccinated infant itself attacked with a definite scarlatinal rash.

Summary of reporter's conclusion. The inquiry was directed mainly to trace the relationship between exposure to scarlatinal infection and abnormalities in the course of vaccination, which was shown in premature rupture of vesicles, in formation of well-marked areola, in axillary abscess, and—in the two cases which proved fatal—in pyæmia. There can be no doubt as to the relationship between these departures from normal effects of vaccination and the presence of scarlet fever in the houses of the vaccinated.

[S. C.]

CASE LXXX., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE REGISTRAR-GENERAL. **Ab 2**

(*Report dated* 13*th March* 1890.)

Case. G. S., male, age four months.

Vaccination. April 23rd, 1889, by Public Vaccinator. Arm to arm.

Death. June 1st, 1889.

Certified cause. "Sloughing and cellulitis, post vaccinal." (Inquest.)

S. R., female, vaccinated on April 16th with Warlomont's calf lymph together with four other children. Normal course.

E. E. A., female. Normal course.

E. L., female. Normal course.

Vaccinated in two places successfully. No excessive areola or inflammation when inspected on April 30th. One (or both ?) vesicle opened to furnish lymph for sub-vaccinee.

On returning home after the inspection the mother applied cold bread poultices to arm, and, later, cream. A few days after the arm began to ged red, the redness gradually extending to shoulder and neck and down to elbow, whilst the "pocks ran together," and before death the mother says that four places "exactly like "vaccination pocks" broke out on each leg, on one arm, and on scalp. The case was considered by the medical man in attendance as one of phlegmonous erysipelas. At inquest the public vaccinator deposed that when he saw child on May 21st the vaccination wounds had coalesced and formed a gangrenous sore. He considered the child quite healthy when inspected on 8th day, and vaccinated from it.

A previous child had died from abscesses in the neck, variously attributed by mother to "vaccination" and to "teething." The father was employed in canal works, and the family (four children) with three lodgers, occupied a temporary wooden hut with two spacious rooms, one of which assigned to the family. The water supply and excrement disposal (pail system) appeared to be good, but an open stagnant ditch containing organic refuse ran in front of the huts. Mother described as dirty and slovenly, and on day of inspection (April 30th) she was suffering from an open discharging sore on lobe of one ear produced by earring.

The reporter concludes from fact that vaccination in the vaccinifer, co-vaccinee, and sub-vaccinee was perfectly normal, and also in vaccinee up to 8th day, that neither lymph nor operation was at fault, but thinks it not at all improbable in view of mother's character and habits, and the surroundings of the child, that the vaccination wounds became inoculated with septic matter from mother's ear.

[S. C.]

CASE LXXXI., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE REGISTRAR-GENERAL.

(*Report dated* 11*th March* 1890.)

A. I. W., male, age three months.

April 3rd, 1889, by private practitioner.

May 18th, 1889.

"Vaccination 45 days; secondary (*sic*) 9 days; abscess "of axilla six days."

Calf lymph supplied by National Vaccine Establishment. No record of the use of this lymph in other cases kept by the vaccinator, but from his return to the N. V. E. it appears that he received four points, of which one was used for this case on April 3rd, one on April 9th, one on April 25th, and one on May 4th. (There is a discrepancy here, since to the reporter he stated that the 4th point was destroyed).

The two children vaccinated on April 9th and 16th (25th ?) respectively, were seen by reporter, who learnt that in each case the vaccination had a normal course, and each presented well foveated scars.

None.

On 8th day "two groups of vesicles about the size of "sixpence each," and going on well. (In return to National Vaccine Establishment "four successful "insertions"). Mother stated that the child was vaccinated in two places, and presented "two good pocks" on 8th day, without any redness noticeable. The vesicles were pricked by the vaccinator, but lymph not used. During next fortnight the vesicles showed no tendency to heal, and during third week after vaccination crusts formed.

Exactly four weeks after vaccination (*i.e.*, on May 1st), the child had attack of convulsions, during which the scabs got torn off, the resulting sores became surrounded by erythema, which spread down to elbow. The sores had a "punched out" appearance, but under simple treatment they healed rapidly, and the redness subsided. About May 10th a large axillary abscess formed. This was opened on or about the 16th, and the child died from exhaustion on 18th. There had been no ointment dressings and no shield worn.

Child said to have enjoyed good health prior to vaccination. *Previous history.*

Mother fairly healthy, somewhat strumous; had axillary abscess in infancy and abscesses once or twice in later life. No "suggestion whatever of syphilis in the case." *Family history.*

The reporter thinks that the axillary abscess was probably due to absorption from accidentally injured sores in a child having some strumous taint. The slight tendency of sores to heal was probably due to constitutional peculiarity. *Summary of reporter's conclusion.*

[S. C.]

CASE LXXXII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE REGISTRAR-GENERAL. **BB / 1 (2)**

(*Report dated 7th May* 1889.)

G. B., female, age five months. *Case of.*

April 4th, 1889. By private practitioner. *Vaccination.*

May 31st, 1889. *Death.*

"Vaccinia; septic absorption." *Certified cause.*

Calf lymph (Renner) in tube,—one portion having been used an hour or two before to vaccinate another child, the co-vaccinee. Instrument, a new needle. *Source of lymph.*

The vaccination perfectly normal. *Co-vaccinee.*

No inflammation at end of first week. Vesicles not opened. *Course of vaccination.*

About 10th day vesicles began to discharge, causing secondary vesicles on arm; subsequently vesicles appeared on nose and other parts of face "apparently "due to inoculation from the arm by the child's "fingers." Arm was much swollen and poultices were applied. The four vaccination places coalesced and never healed. Child taken to a hospital where remained six days; bronchitis supervened, and she died nearly two months after vaccination. *Course of illness*

Attributed to accidental inoculation of septic matter. *Summary of reporter's conclusion.*

[S. C.]

CASE LXXXIII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR. **Ac / 1 (1).**

(*Report dated* 28*th January* 1890.)

E. S., female, aged five months. *Case of.*

October 21st, 1889 by Public Vaccinator. *Vaccination.*

November 12th, 1889 (22nd day). *Death.*

Vaccination three weeks, erythema 10 days, diarrhœa two days. *Certified cause.*

The lymph was taken a week previously from the arm of F. L. (Case LXXXV. of this series of reports), and was stored on points. (See General Summary.) *Source of lymph.*

Vaccinated on October 14th with lymph stored on points obtained from the arm of A. (No. 500 in register). Child was not well when the lymph was taken. During the second week she sickened with erysipelas, and died on November 16th. *Vaccinifer.*

For details see Case LXXXV.

Three. One, No. 17, suffered subsequently from erysipelas, the vesicles discharging offensive pus. The child had rallied at time of report. One, No. 15, by inference did well; and one, though it is said to have had slight inflammation round the vesicles on the 8th day, subsequently did well. *Co-vaccinees.*

None, the vesicles were not opened. *Sub-vaccinees.*

Three vesicles formed by the 3rd day. Two ruptured and inflammation commenced around them. By the 8th day inflammation had extended to the wrist, *Course of vaccination.*

subsequently it spread over the trunk. The child died on the 22nd day.

Method of vaccination. Lancet used. Points were moistened by "breathing on them." Vaccinator frequently made insertions too near together.

Family history. Good. Father is a horse keeper.

General surroundings. Healthy.

Summary of reporter's conclusion. See General Summary appended.

$\frac{Ac}{1}$(2.V). CASE LXXXIV., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated 28th January* 1890.)

Case. E. P., female, aged eight months.

Vaccination. October 14th, 1889, by Public Vaccinator.

Death. November 13th, 1889.

Certified cause. "Diffuse cellulo-cutaneous inflammation 10 days after vaccination, 19 days."

Source of lymph. Arm of child A., No. 500 on Register, taken October 14th, stored on points procured from N. V. E., on October 5th. No complaint received about any vaccination with other tubes from same calf (No. 2,007).

Co-vaccinees. Three. One (Case LXXXV. of this series of reports) died of erysipelas 32 days after vaccination; points being used. The two others, one vaccinated from a point and the other from a tube, did well.

Sub-vaccinees. One. Vaccination normal.

Course of vaccination. Up to the 8th day normal On 8th day vesicles were opened and several tubes filled from them. During the same night the child sickened and by next day the arm was much inflamed. By the 11th day the vesicles had all ran into one. Subsequently the inflammation spread over trunk and to extremities, the child dying on the 30th day.

Method of vaccination. Lancet used. Insertions frequently made by vaccinator too near together.

Previous history. Good.

Family history. Father and mother strong, young, and healthy, with three other healthy children. During the week after her child was vaccinated the mother fell ill and developed a submaxillary abscess. Subsequently the father suffered from an abscess on his right little finger.

Sanitary conditions. Good.

Summary of reporter's conclusion. See General Summary appended.

$\frac{Ac}{1}$(2.V). CASE LXXXV., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated 28th January* 1890.)

Case of. F. L., male, six months.

Vaccination. October 14th, 1889, by Public Vaccinator, Mr. H.

Death. November 16th, 1889.

Certified cause. "Vaccinia, 33 days; erythema and abscess of foot, 22 days."

Source of lymph. From arm of child A. (No. 500 on Register). Stored on points and used same day. (See General Summary.)

Vaccinifer. Healthy. Vaccination ran a normal course. Child was vaccinated with calf lymph stored on points obtained from the N. V. E. on October 5th; no bad result is reported by any vaccinators who had used lymph from same calf (No. 2,007).

Co-vaccinees. Three. One, E. P. (Case LXXXIV. of this series of reports) developed erysipelas and died on November 13th. The other two did well. Five other children were vaccinated at same station, at same time, with lymph from different sources. Two with calf lymph. In one of these an axillary abscess formed during the second week, and during fifth week the arm inflamed from shoulder to elbow. The child eventually recovered.

Sub-vaccinees. Three. Of these, one, E. S. (Case LXXXIII.), died of erysipelas on November 12th, one B., suffered from erysipelas and recovered, and one did well.

Course of vacc. The vesicles formed by 5th day, and though apparently normal, the child sickened, not taking its food well and being in pain. On the 8th day all the vesicles were opened and several points were charged from them. After the 8th day the arms inflamed from shoulder to elbow. By 13th day (according to mother), 20th according to Mr. H., an abscess had formed on right foot, the inflammation of the arm increased, two days later it extended to trunk, subsequently spreading over limbs, and with little change the child died on the 33rd day.

Vesicles were poulticed.

Tree. of vesicles. Met. of vacc. Lancet used. Insertions frequently made by vaccinator too near together.

Prev. hist. Good.

Fam. hist. Good. Father is a horse keeper.

Gen. surroundings. Satisfactory. It is not known that the child was brought into contact with any person suffering from infectious disease.

Summary of reporter's conclusion. See General Summary appended.

GENERAL SUMMARY TO CASES LXXXIII., LXXXIV., AND LXXXV.

Conclusions as to source of infection. The reporter considers that the original infection is to be looked for in the "acts and instruments of the "vaccinator."

Vaccinating stat. At F.N. a small room (fifteen feet by ten feet six inches, and seven feet six inches high) in a cottage is used; occupied by a crippled woman. The bed which largely encroaches on the space, serves as table for babies' clothes, vaccinator's instruments and points. In the case of F. L., the charged points were, according to Mrs. L.'s statement, placed on the bed to dry.

Storage of lymph on points. The lymph used in all three cases was stored on ivory points. These originally obtained from N. V. E. had been repeatedly used.

This practice is specifically forbidden in the instructions issued by the Local Government Board to Public Vaccinators (No. 9). The points were cleansed between each using by being steeped "in boiling water "with carbonate of soda added." The use of old recharged points is admitted to be a source of danger, but in this case the reporter dismisses it as he considers "there is no evidence whatever that harm resulted "from their use," and because "E. P. was not touched "with points in taking lymph from the arm." (October 21st.)

Note.—E. P. was, however, vaccinated with lymph stored on points, as were F. L. and E. S., who also died.

It should further be noted that of the total of 28 children, five were vaccinated with "tube" lymph and eventually did well, although three presented irregularities in the development of the vesicles. Four were vaccinated from arm to arm and did well, although one had a rubeolous rash, and in two others the vesicles coalesced.

Nineteen were vaccinated with points; four of these developed erysipelas, which terminated fatally in three. Two suffered from excessive inflammation of the arm, and one from axillary abscess.

Opening of the vesicles. The vesicles were opened on the 8th day in three out of the nine cases vaccinated at the F. N. station on October 14th. These all suffered from erysipelas and two died. Of the remaining six cases in which the vesicles were not opened, four pursued a normal course, and the remaining two eventually did well, though in both, two vesicles ran into one.

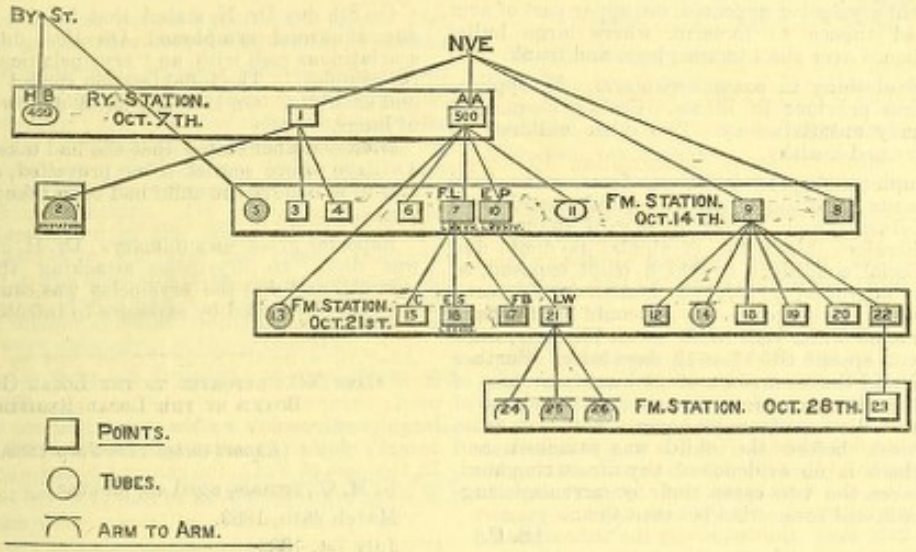
Possible effect by person of vaccinator. *Up to October 14th*, Mr. H. had been attending a case of psoas abscess with "discharge of such a virulent "nature that the nurse suffered severely from abscesses, "undoubtedly caused by it, and he himself, though he "used eucalyptol ointment and carbolic acid soap con-"tracted several angry phlegmons on his hand." These appeared both *before* and *after* the period of the vaccinations; although *at* the time he was *free* from them. On the morning of *October 14th* he was attending to the case until 2 a.m. He commenced his vaccinations (at F. N. station) at 1 p.m. on the same day. The reporter inclines to the belief that the infection of the three cases who died took place on *October 21st*, the day on which the vesicles of 7 and 10 were opened and 16 was vaccinated, thinking it probable that they were infected from the hands of the vaccinator, on which abscesses, probably of septic origin, developed later.

Note.—It seems, however, that No. 7 really *sickened* on October 18th, not on the 21st; although on the 8th day, October 21st, the arm was not so much inflamed as to prevent lymph being taken from it for vaccinating 16 and 17. But the important point is not so much the *date* as the *source* of infection, and this appears to have been due directly or indirectly to the septic condition of the vaccinator's hands, caused by his attendance on a case with profuse offensive discharge of so virulent a nature that his own hands had been inoculated, and the nurse suffered severely from abscesses.

The *vaccinator* believed the taint was traceable to No. 500, the first removed from the calf, but there is no evidence to show that this was the case.

There was at the time no prevalent infectious disease. Two cases of facial erysipelas occurred within 50 yards of the house where the vaccinifer A. (No, 500) lived; but he did not come in contact with them. *Infectious disease.*

Note.—It is a coincidence that the fathers of the four children who were most severely affected were all engaged in the care of horses. No epizootic however, is known to have existed in the neighbourhood. An outbreak of anthrax is reported to have occurred at a distance of about five miles.



Nos. 7, 10, 16. Fatal erysipelas.
Nos. 500, 1, 3, 4, 6, 11, 18, 19, 20, 21, 23, 24. Normal.
No. 2. Healing delayed by accidental removal of scabs; otherwise normal.
No. 5. Two vesicles coalesced; some inflammation; scabs removed twice; scars irregular.
No. 8. Two vesicles coalesced.
No. 9. Axillary abscess; excessive inflammation.
No. 12. Four secondary vesicles.
No. 13. First vaccination unsuccessful; one vesicle only rose after second vaccination. There was suppuration under the scab.
No. 14. Unsuccessful. First vaccination.
No. 17. Erysipelas; eventual recovery.
No. 22. On the tenth day inflammation to elbow; discharge from vesicles; "rash" on face and arm. Two brothers subsequently developed boils (p. 18).
No. 25. Two vesicles coalesced.
No. 26. First vaccination unsuccessful; when repeated rubeolous rash.

[T. D. A.]

(V) CASE LXXXVI., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated* 31*st December* 1889.)

M. P. C., female, age three months.

November 8th, 1889, by Public Vaccinator. Three insertions.

December 11th, 1889.

"Vaccination and erysipelas."

J. J., male, age two months. Had normal vaccination.

Five in number. All recorded as "successful" on 8th day (November 15th). All but one (who had removed) were seen by reporter, who found normal scars.

None directly vaccinated from the case, but lymph taken and sent to N. V. E. in seven tubes, which was distributed among four different people on December 16th. "No ill result reported" from use of this lymph up to January 3rd, 1890.

Did well up to 8th day when lymph was taken from vesicles.

On day after inspection (*i.e.*, on November 16th) the child was irritable, and on 17th a general red rash came out, which disappeared in 48 hours. On 19th the arm was inflamed about the vesicles, which showed nothing unusual; and next day the redness had spread up and down the arm, and was declared by medical attendant to be erysipelas. The rash continued to spread to other parts of the body, finally attacking the head. It was simply cutaneous, there was no vesiculation nor suppuration and no discharge from vaccinated places. Death took place from exhaustion.

The mother said she had "not in any way touched the arm." "The infant was wearing a Turkey red "twill dress, with calico lining, which had been worn "by previous children and frequently washed." No shield was worn. No applications made to arm. *General conditions.*

No erysipelas in district. Infant had not been exposed to weather. Sanitary state of house good. District thickly peopled. All other children (six ?) healthy, and went through their vaccination well.

A case of spreading cutaneous erysipelas commencing about 10th day after vaccination, and reporter was unable to assign any definite cause for its occurrence. *Summary of reporter's conclusion.*

[S. C.]

CASE LXXXVII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY ONE OF THE BOARD'S INSPECTORS. **Ac 2** (3)

(*Report dated* 22*nd May* 1890.)

H.J.S., age five months. *Case of*

October 10th 1889, by public vaccinator. (New lancet used.) *Vaccination.*

November 11th, 1889. *Death.*

"Erysipelas." *Certified cause.*

From a child (No. 286) vaccinated on October 8th, when new ivory points charged. *Source of lymph*

A healthy child, vaccinated successfully from No, 184, who had been done with calf lymph. *Vaccinifer.*

Co-vaccinees. In all 14, *i.e.*, 7 at same village as vaccinee, 2 at another, and 5 at another. All but H. J. S. did perfectly well.

Sub-vaccinees. None.

Course of vaccination. On 8th day it had four natural unbroken vesicles; no lymph taken from it. Child quite well. Vesicles dried up about 14th day. No shield used.

Course of illness. On 15th day child taken out to a neighbouring town, Y——; weather fine, not cold. Mother did not think arm was rubbed. Next day not so well, and on 19th day it was seen by public vaccinator, who found no sign of erysipelas, and scabs still adherent. On October 31st scabs were partially detached, and places discharging slightly. On 25th or 26th day (November 3rd and 4th) erysipelas appeared on upper part of arm and spread thence to forearm, where large bullæ formed, thence over chest to arm, legs, and trunk.

General conditions. No dyed clothing in contact with arm. No applications to arm previous to illness. Cottage clean, but garden privy unsatisfactory. Two other children in family alive and healthy.

Summary of reporter's conclusion. The lymph used (second remove from calf) gave normal results in all the co-vaccinees, and also in cases inoculated from lymph yielded by one of them. The reporter therefore thinks the erysipelas no doubt due to some special conditions to which child exposed, so that it was engrafted on the vaccination at comparatively late date in its progress. It could hardly have been contracted on its visit to Y—— on 15th day, since rash did not appear till 11 or 12 days later. Further inquiry elicited the occurrence of at least four cases of erysipelas in village where vaccinee dwelt, and one of them at short distance from its home. This case arose about a week before the child was attacked, and although there is no evidence of any direct communication between the two cases their occurrence is suggestive of a casual connection between them.

[S. C.]

A c / 2 (2.V). CASE LXXXVIII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE REGISTRAR-GENERAL.

(*Report dated 13th May* 1890.)

Case of. A. G., female, aged five months.

Vaccination. June 26th, 1889, by Dr. A., Public Vaccinator.

Death. August 1st, 1889.

Certified cause. Erysipelas "caused by irritation of the vaccine "vesicles."

Certified by. Dr. A., vaccinator.

Source of lymph. Direct from arm of child R. B. Vaccination normal.

Co-vaccinees. Two. Vaccination normal in both cases.

Sub-vaccinees. One. Vaccination normal.

Course of vaccination and illness. Quite normal until after formation of scabs. Two fell off naturally and places healed. Two were rubbed off. Shortly after (date stated by mother to be uncertain, by doctor as 14 days after vaccination) wounds began to inflame; inflammation spread over body and extremities. Dr. A., who treated the child until its death, states that the case was one of "undoubted phlegmo-"nous erysipelas."

Treatment of vesicles. All opened on 8th day. Later two scabs were rubbed off, and mother treated the wounds with castor oil rubbed in with her fingers.

Method of vaccination. Performed with ordinary lancet.

General surroundings. Mother "labourer's wife, Irish, and dirty."

Summary of reporter's conclusion. From the evidence reporter concludes that the erysipelas was not due to fault in the lymph or in the operation of vaccination, but to the irritation of the raw surface of the injured vesicles, infection being probably caused by the application of castor oil by the mother's dirty fingers.

[T. D. A.]

CASE LXXXIX., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE REGISTRAR-GENERAL.

(*Report dated 19th May* 1890.)

C. B., female, age not given.

October 17th, 1888, by Dr. H., Public Vaccinator.

19th day after vaccination.

Not stated.

Not stated.

Four. All reported to have done well.

Not stated.

On 8th day Dr. H. stated that he did not remember any abnormal symptoms. On 10th day he found a scarlatinous rash with an "erysipelatous blush around the vesicles." The inflammation spread involving arm and shoulder. On 19th day child died with congestion of lungs.

Note.—Mother stated that she had taken her child to a village where scarlet fever prevailed, and there was reason to believe the child had been taken into infected houses.

Reporter gives no summary. Dr. H. considers death was due "to erysipelas attacking the vaccination wound" and that the erysipelas was caused by "scar-"latina contracted by exposure to infection."

[T. D. A.]

CASE XC., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.*

(*Report dated 17th July* 1889.)†

E. M. C., female, aged six months.

March 26th, 1889.

July 1st, 1889.

"That the said E. M. C. died at the General Infirmary, "Leeds, aforesaid, on the 1st day of July 1889, and so "the jurors aforesaid upon their oaths do further say "that she died from syphilis acquired at or from vacci-"nation."

[T. D. A.]

CASE XCI., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE REGISTRAR-GENERAL.

(*Report dated 13th May* 1890.)

A. A. D., female, aged four months.

May 15th, 1889, by Dr. F.

June 14th, 1889.

Pyæmia.

Dr. W——'s., calf lymph procured from a neighbouring practitioner.

Not stated.

No record. It is believed that some children were vaccinated from A. D., but the number and results are unknown.

On 8th day the vesicles were normal. On the 18th day the child was "feverish" and two days later there was inflammation round the scabs. This subsequently extended to chest and abdomen, and abscesses formed on arm and shoulder, abdominal wall and groin. Pneumonia supervened, and the child died on the 31st day.

Lotions, fuller's earth, starch, violet powder, and cream were in turn applied to the vesicles.

The mother had at the time abscesses on her right breast, some of which were discharging; the child was suckled at the left breast. Both the person of the mother and the house were very dirty.

The reporter is of opinion that there is strong presumption that the pyæmia from which the child died had its origin in the discharge from the suppurating breast of the mother, or in one of the deleterious applications made to the vesicles.

[T. D. A.]

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* *This case is also amongst those brought to the notice of the Commission with a view to their investigation; being the same as that numbered as Case* 1 *on page* 211.

† *As the Commission have made inquiry into the circumstances of this case, it has not been thought necessary to give here an analysis of this report.*

Case XCII., reported to the Local Government Board by the Registrar-General.

(*Report dated 5th August* 1890.)

E. S. H., female, aged four months.

October 24th, 1889, by Public Vaccinator, Dr. F.

November 10th, 1889.

"Blood poisoning"; and further that the "cause "of the blood poisoning was erysipelas, the result of "vaccination."

Child No. 285, collected six months previously (April 15th) and stored in tubes.

Fine healthy child; vesicles free from areola.

One. Vaccination normal: performed March 31st, 1890, lymph having then been stored almost 12 months.

None. It is uncertain whether vesicles were opened.

Vesicles were healthy on 8th day. On 11th day the child was drowsy. On 12th day there was some, but not noticeable, inflammation round the vesicles, and child seemed to be suffering from bad cold. It was then seen by Mr. O., who considered that it was suffering from bronchitis. On the 14th day he detected inflammation of the lungs. Two days later the inflammation of the arm had spread from the vesicles up to the neck and down to the forearm; this was definitely pronounced to be erysipelas. Both doctor and mother agree in stating that the lung complications were antecedent to the erysipelas.

The vesicles were not irritated; no application was made to them.

Vaccination performed with a Cooper Rose needle, sterilized at end of each day by heat of a spirit lamp.

Said by mother to have been good; but child when first seen by Mr. O. is said to have been badly nourished and unhealthy.

Good.

No known infectious disease in neighbourhood. The atmosphere of the rooms extremely foul; they opened into one another. In one of them an almost bedridden woman lived. The other rooms were very dirty.

The reporter considers that "it may be confidently "concluded that the lymph was in no way responsible" for the child's illness, and he draws attention to the fact that the child was badly nourished and unhealthy and that it passed a considerable portion of its life in a polluted atmosphere, and that the vaccinifer and the co-vaccinees did well.

[T. D. A.]

Case XCIII., reported to the Local Government Board by the Registrar-General.

(*Report dated 27th May* 1890.)

J. L., male, aged nine months.

March 28th, 1889, by deputy of Public Vaccinator.

August 1st, 1889.

"Septicæmia and exhaustion." On further inquiry the practitioner, Dr. M., who signed the certificate stated: "that the septicæmia was a sequel of vac- "cination, and it is more than likely that the case was "one of vaccinio-syphilis."

These statements are erroneous, and are admitted to be so by Dr. M., who confused the case with another (Case CXXVII). They have nothing to do with the present case.

Not stated.

Not stated.

Not stated.

None. The vesicles were not opened.

Normal throughout. There was no excess of inflammation, no enlargement of axillary glands, no general eruption. The scabs came off and the arm had entirely healed in four weeks.

When vaccinated the child had a cough, which during the first week proved to be whooping-cough. Subsequently it became emaciated, and suffered from a purulent discharge from its nostrils.

Mother's sister, and two brothers of father had died of consumption. *Family history.*

The reporter is of opinion that the child's death was due to inherited tubercular disease, and that there is no reason for connecting it in any way with the vaccination. *Summary of reporter's conclusion.*

[T. D. A.]

Case XCIV., reported to the Local Government Board by the Registrar-General. Ab 1 (1).

(*Report dated 16th August* 1890.)

W. C., male, age six months.

October 22nd, 1889, by Public Vaccinator. Arm to arm. By means of a "Cooper Rose" vaccinator, sterilized daily by heat, but apparently not cleansed after each vaccination. *Case of Vaccination.*

November 18th, 1889. *Death.*

"Sloughing of vaccination vesicles, three weeks; *Certified cause.*
"bronchitis, six days."

No. 169 in register. Passed through vaccination normally, and at inspection showed three well-foveated marks. *Vaccinifer.*

None; but six other children vaccinated on same day from three sources, each distinct from that used for vaccinee. In two of them the arms unduly inflamed during second week, and one had burst vesicles (? from friction). In sixth case one vesicle burst and arm began to inflame on 7th day, spreading from shoulder to elbow with formation of axillary abscess later. The vaccination places became deep and discharged considerably, not healing for five months. Lymph used in this case was from a different source than that used for any other. *Co-vaccinees.*

None. *Sub-vaccinees.*

Four insertions; all took. About 3rd day child seemed ill and became sick, the sickness continuing during first week. Slight redness noticed round vesicles about 5th day, but public vaccinator does not remember anything abnormal when inspected on 8th day; vesicles not opened. *Course of vaccination.*

By 12th day arm much inflamed and swollen; vaccination places sloughing and suppurating, leaving deep ulcers, two of which coalesced on detachment of sloughs. Some axillary swelling, but no abscess. Bronchitis set in about 25th day, and child died of exhaustion. *Course of illness.*

No shield worn, nor dyed clothes; sleeve cut to prevent rubbing. No applications except those ordered by medical attendant. *General conditions.*

Child seemed healthy when vaccinated; partly nursed, partly hand fed with milk and biscuit. *Family history.*

Parents been married four years; one other child, who appears fairly healthy. No miscarriages. Mother says she enjoys good health, but does not look strong. Of nine brothers and three sisters one of former died young of some brain disease, and two sisters of consumption; two other brothers are dead. Her father died of "abscess on the lungs." Husband said to be strong and healthy.

House clean, well ventilated. No drains in it, but a privy within six yards of it. *Dwelling.*

The public vaccinator not aware of any zymotic disease in the town, and other medical men endorse this. No case of erysipelas heard of. Reporter learnt that about September two cases of enteric fever in two nearly adjoining cottages, and one of these patients recently convalescent was present at the vaccinations on October 22nd, and it was her infant which suffered from axillary abscess. Her dwelling was most insanitary and unwholesome. *Health of town.*

Not attending any zymotic disease at the time. The instrument he uses is favourable for retention of foreign matter, and it is difficult to say whether it was invariably sterilized after use, and it certainly was not usually cleansed between the vaccination of one child and the next. *Vaccinator.*

The child who was ill during first week showed nothing definitely abnormal till the 12th day, when arm became inflamed, and the vaccination places gangrenous. *Summary of reporter's conclusion.*

The necrotic action extended, ulcers coalescing, axillary glands enlarging, and on 25th day bronchitis supervened. The child's mother came of a family with strongly marked tubercular taint, which in the reporter's opinion may have tended to modify the type of the inflammation. Whether this inflammation and that observed in four other of the children vaccinated on the same day (although not from same lymph) are to be attributed to the state of the instrument used is not clear, but in one of the cases the insanitary surroundings doubtless played a part.

[S. C.]

O1.

CASE XCV., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE REGISTRAR-GENERAL.

(*Report dated 4th August* 1890.)

Case of. J. A. C., 19 months, male.

Death. October 1st, 1889.

Certified cause. "Blood-poison (after vaccination); exhaustion."

Summary of facts. Owing to the death of the medical man who furnished the above certificate, and the fact that the parents had left the neighbourhood and could not be traced, but few particulars could be gleaned by the reporter when inquiry was made 10 months after the child's death.

He learnt, however, that the father, who had been in the army, was of intemperate habits; and that the child was born in a garrison town in the South of England and vaccinated there by an Army surgeon; that when brought in April 1889 to the town where it died, it was said by its grandmother to have had a very bad eye, and an "inflamed and swollen throat," which the deceased doctor ascribed to the vaccination that had been performed some months previously. The child's arm was removed at an eye hospital of an important provincial town, and the surgeon who operated regarded the disease as "tubercular infiltration of the eye-ball," and both he and the house surgeon had no reason at all for thinking that the child's condition was in any way connected with vaccination.

The reporter was informed that the medical man who gave the certificate "was well known in the "neighbourhood as an opponent of vaccination."

[S. C.]

O1.

CASE XCVI., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE REGISTRAR-GENERAL.

(*Report dated 25th July* 1890.)

Case of. B. E., male, age 12 months.

Death. August 21st, 1889.

Certified cause of. "Phthisis consequent on vaccination, four months; "convulsions, one month."

Summary of case. The medical man who gave this certificate was only called in to see the child the day before it died; and it is stated that the first certificate he signed simply recorded the cause of death as "convulsions;" but that he subsequently desired to replace that certificate by the one in the terms stated above. His information of the child's illness was entirely derived from conversation with the parents, and when asked to explain his use of the term "consequent," he said, "consequent as following after, not necessarily as to the "causation but as to the fact."

The case was inquired into by the local Sanitary Authority at the time the death was registered, and he learnt that there was a strong family taint of consumption on the mother's side.

It was further ascertained by the reporter that the child passed through its vaccination normally and was quite well for two months, after which time it sickened, and suffered from gastro-intestinal disturbance, in no way connected with the vaccination in the opinion of the medical man (who was the public vaccinator who had performed the vaccination) under whose care it then was. Later the family removed to another part of the country, where the child improved in health, and where, during dentition it was attacked with convulsions, which proved fatal.

Although the parents had said that the child had not been well since vaccination, the mother admitted that she was surprised to see that cause entered on the death certificate.

[S. C.]

CASE XCVII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE REGISTRAR-GENERAL. B/1.

(*Report dated* 23*rd October* 1890.)

E. B., female, seven months.

December 22nd, 1888.

"Septicæmia."

In response to further inquiry, the certifying practitioner stated that "the probable cause of septicæmia "was 'abscess in the axilla.' It appeared three or "four weeks after vaccination."

Very little information could be gained about this case. At the date of inquiry the parents, as well as the certifying practitioner, had left the district. The child was probably vaccinated on October 17th, 1888, as the certificate of its successful vaccination is dated October 24th, 1888, but there is no entry of her name in the register of vaccinations.

The assistant to the practitioner who gave the death certificate remembered that the arm was long in healing, being covered with an eczematous crust, and that the axillary abscess occurred on the same side as the vaccination. The reporter considers that "the case "would seem to have been one of late septic infection "through an open sore."

[S. C.]

CASE XCVIII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE REGISTRAR-GENERAL. Ac/0 (5)

(*No Report.*)

W. F., female, three months.

December 20th, 1888.

"General œdema."

Case referred on May 27th, 1889, together with another which occurred three years previously. At the time of reference there was no inspector available for making the inquiry, and the facts of the case are only given in the following endorsement on the copy of the death certificate by the certifying practitioner:—

"I have no doubt that the condition into which above "drifted may rightly be attributed to effects of vacci-"nation. The child had remarkably fine vesicles on 8th "day, from which I vaccinated six other children. "About 10 days subsequently the child was brought to "me suffering from diffuse *superficial* inflammation of "vaccinated arm, and side, which gave way to treat-"ment, but the child never properly rallied, and "became in the condition I have characterised by the "term 'general œdema.' I was, for obvious reasons, "adverse to giving friends a certificate in any way "attributing the fatal result to vaccination. I may "mention that all the children vaccinated from this "child did remarkably well, not one having even an "erysipelatous blush on the arm."

[S. C.]

(V). CASE XCIX., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE REGISTRAR-GENERAL.

(*Report dated 26th June* 1890.)

J. C. L., male, aged, three months.

September 11th, 1889, by private practitioner; by lancet.

October 5th, 1889.

"Vaccination; acute eczema; asthenia."

Calf-lymph (Renner's).

No record.

No record.

Normal. Vesicles opened on 8th day, lymph taken from them. When seen on September 22nd—for broncho-pneumonia—the arm was going on well. No swelling or redness, or glandular enlargement.

First taken ill with convulsions and fever (temperature 102°) and symptoms ascribed to broncho-pneumonia. From this attack, for which it was attended by Dr. J., the vaccinator, the child recovered rapidly, but on the 30th it was taken to another doctor. (Dr. R.) the one who subsequently certified the death. His account is to the effect that the child was then "covered all over with "eczema" which had first appeared at the site of vaccination. The mother stated that a week after the inspection a rash appeared on the nates, scrotum, and dorsum of one hand, that his throat seemed sore, and he had attacks of coughing. For this he was attended by Dr. J. (see above). But she denies Dr. R.'s statement as to the rash being generalised. Dr. R. on the other hand is sure there were no lung symptoms, and when the child died in exhaustion he gave the above certificate as embodying his view of the case. On account of that certificate the coroner made inquiries, and after receiving Dr. J.'s account did not hold an inquest. Dr. J. thought it more likely that the child had succumbed to broncho-pneumonia, a relapse probably caused by exposure in taking the infant to Dr. R.'s surgery, and he said that the skin eruption was of the nature of intertrigo, there being no sign of eczema when he saw the child. In that explanation the reporter was disposed to agree, and also that vaccination was not responsible for the fatal result.

[S. C.]

(V). CASE C., REPORTED TO THE LOCAL GOVERNMENT BOARD BY ONE OF THE BOARD'S INSPECTORS.

(*Report dated February* 1890.)

S.E., male, aged seven months.

October 17th, 1889. By Mr. H., Public Vaccinator.

December 5th, 1889.

"Blood poisoning."

Dr. B.

Unknown.

Fourteen children were vaccinated at same time, of these two only seem to have pursued a regular course.

Eight suffered severely. Of these, two died of erysipelas. One had a scarlatina like rash with diffuse cellulitis of vaccinated arm, and abscesses. Two had a red blush extending over body, in one of which little watery "bladders" appeared round the vesicles and discharged. Three suffered with abscesses; in two of these the vesicles were broken and "weeping" by 8th day.

Four suffered in a less degree. Of these, all had abnormal inflammation. In one the vesicles coalesced, the arm remaining long unhealed; in another the arm was swollen and painful by 3rd day.

None.

Wounds said to have been red and irritated two days after vaccination. By 8th day "the arm was much in-"flamed." A week later a rash appeared lasting only one day. The feet and hands were swollen. Diffuse erysipelatous inflammation supervened, and two abscesses formed and broke in the axilla. The vaccination sores subsequently ulcerated into one. Shortly before death "a patch of tissue became inflamed, and "then necrosed in the forearm."

Vesicles were opened; they do not appear to have ruptured. *Treatment of vesicles.*

Delicate, ill-nourished child. *Previous history.*

See Summary to Cases LXI. and LXVI. *Summary of reporter's conclusion.*

[T. D. A.]

CASE CI., REPORTED TO THE LOCAL GOVERNMENT BOARD BY ONE OF THE BOARD'S INSPECTORS. **Ac/1(1).**

(*Report dated February* 1890.)

R. M., sex not stated, aged seven months. *Case.*

October 17th, 1889, by Mr. H., Public Vaccinator. *Vaccination.*

October 31st, 1889. *Death.*

"Catarrh" of "some days" duration. *Certified cause.*

Dr. H., vaccinator. *Certified by.*

Not known. *Source of lymph.*

Fourteen children were vaccinated at same time. Of these, two only seemed to have pursued a normal course. *Co-vaccinees.*

Two died. (One the subject of this report.)
Six suffered more or less severely.
Four suffered in a less degree. (See Case C.)

None. *Sub-vaccinees.*

Child restless and poorly before 8th day. On 8th day redness on shoulder of vaccinated arm and on back. This subsequently subsided, but re-appeared and spread over chest, arms, and legs. Limbs became œdematous. Vesicles scarcely rose, but broke and discharged freely. Child died a fortnight after vaccination. *Course of vaccination.*

Not given. *Previous history.*

Not given. *Family history.*

See Summary to Cases LXI. and LXVI. *Summary of reporter's conclusion.*

[T. D. A.]

CASE CII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY ONE OF THE BOARD'S INSPECTORS. **O2/1.**

(*Report dated February* 1890.)

F. C., male, aged three months. *Case of.*

October 17th, 1889, by Mr. H., Public Vaccinator. *Vaccination.*

November 15th, 1889. *Death.*

"Infantile convulsions." *Certified cause.*

Dr. P. *Certified by.*

Not known. *Source of lymph.*

Fourteen children vaccinated same day. (*See* Nos. C., CI.). *Co-vaccinees.*

Not stated. *Sub-vaccinees.*

Stated by a neighbour to have done well, and sores to have duly healed. *Course of vaccination.*

"Child had convulsions on 14th November and died "following day." Dr. P. "is positive no suspicious "appearance presented itself to connect child's seizure "with vaccination." *Course of illness.*

Not given. *Previous history.*

Not given. *Family history.*

See Summary to Cases LXI. and LXVI. *Summary of reporter's conclusion.*

[T. D. A.]

CASE CIII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE REGISTRAR-GENERAL. **Ab/2(3).**

(*Report dated 4th July* 1890.)

E. C., female, aged seven days. *Case of.*

October 12th, 1889, by Medical Officer of Workhouse. *Vaccination.*

November 13th, 1889. When 39 days old. *Death.*

"Septicæmia; exhaustion." *Certified cause.*

H. P., Royal Free Hospital. *Certified by.*

Stored lymph in tubes from arm of T. T. Vaccinated with calf lymph from N. V. E., when two days old. *Source of lymph.*

Co-vaccinees. S. D., 42 *days* after lymph was taken from T. T., Course of vaccination "quite normal and satisfactory."

Note.—Other vaccinations were previously performed with same lymph at varying dates from the time it was taken as follows:—

Seven days afterwards, three primary vaccinations. All successful.

Fourteen days afterwards, five adults re-vaccinated. No abnormal results.

Thirty-five days afterwards, one infant. Vaccination unsuccessful, but no injury reported.

At the time of the enquiry (June 1890) only two cases, S. D. (co-vaccinee of E. C.) and one other could be traced.

One of the others had died of phthisis.

Sub-vaccinees. None recorded.

Course of vaccination. 8th day. Vesicles normal. No excessive inflammation.

15th day. Discharged from workhouse well.

24th day (this date is approximate only). Seen at Royal Free Hospital with diffuse redness and swelling of vaccinated arm. Vesicles covered with dark unhealthy crusts. The swelling subsided, but abscesses formed over shoulder and elbow joints followed by "diffuse phlegmonous infiltration of tissues of scalp," ending fatally on 32nd day.

Previous history. E. C. was believed to be healthy at time of vaccination.

General conditions. The mother could not be traced, but she was reported by Mr. C. and by neighbours to have been an "ill-conditioned, destitute, and dirty woman, and addicted to standing about the street in cold, wet weather with the child in her arms."

Summary of reporter's conclusion. The child was discharged from the workhouse well-nourished, and with the vesicles quite normal 15 days after vaccination.

Eight or nine days afterwards it was seen by Mr. C., who found it ill-nourished and the arm much inflamed.

There is no direct evidence as to the origin of the erysipelas; the reporter thinks it probable that the conditions to which the child was subjected after leaving the workhouse, and prior to the complete healing of the arm, were the determining cause of the irritation and septic infection of the vaccination wounds.

[T. D. A.]

Ac 1 (2). CASE CIV., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE MEDICAL OFFICER OF HEALTH FOR L——.

(*Report dated 10th May* 1890.)

Case of. H. M. R., male, aged three months.

Vaccination. February 20th, 1890, by Public Vaccinator, Mr. C.

Death. March 10th.

Certified cause. "Erysipelas; exhaustion."

Source of lymph. Direct from arm of C. P.

Vaccinifer. A particularly robust, healthy child up to February 13th, the date of vaccination. On February 27th, a week after the lymph was taken, inflammation commenced round the vesicles, two of which had scabbed over, while two were unhealed. The inflammation spread down the arm and across the body to the other arm. The child eventually recovered, and by March 22nd (five and a half weeks after vaccination) was well, except a little redness and swelling of the unvaccinated arm.

Co-vaccinees. Four; in all of whom vaccination was normal.

Sub-vaccinees. None. Vesicles not opened.

Course of vaccination. Normal throughout. There was no areola on 8th day, nor any evidence of excess of inflammation round the vesicles at any time.

Course of illness. On the 8th day, February 27th, redness was noticed spreading from the inner canthus of the right eye, the same side as the vesicles. This extended over head, face, and neck, the child eventually becoming unconscious and suffering from convulsions before its death. The inflammation did not at any time reach the vesicles.

Method of vaccination. Satisfactory.

Previous history. Good.

One other child had died five years previously of erysipelas following inflammation of the eyes. This child had *not* been vaccinated.

General surroundings. It is not known that the children H. M. R. and C. P. were brought into contact with any case of erysipelas or other infectious disease, either at their own homes or at the vaccination station. One case of idiopathic erysipelas was known in the immediate neighbourhood. Previous to, and at the time of, their attack complaint was made of overflowing privy middens in the same street as that in which they lived.

Summary of reporter's conclusion. The vaccinifer and the subject of this report both showed signs of erysipelas on the same day, a week after the vesicles of the former were opened and the latter vaccinated. No common cause of infection could be traced; but the reporter calls attention to the fact that they both lived in the same street and on the same side of the street, and that the sanitary conditions were not satisfactory.

[T. D. A.]

B 2 CASE CV., REPORTED TO THE LOCAL GOVERNMENT BOARD BY ONE OF THE BOARD'S INSPECTORS.*

(*Report dated 29th April* 1890.)

Case. J. S., female, aged three and a half months.

Vaccination. March 18th, 1890, by Public Vaccinator. Four insertions.

Death. April 11th, 1890.

Certified cause. A coroner's inquest was held in this case, and resulted in a verdict to the effect that death was due to blood-poisoning, with a rider exonerating the Public Vaccinator from the slightest suspicion of neglect.

Source of lymph. One of a batch of tubes filled on March 4th; but vaccinifer not identified.

Co-vaccinees. Five other children vaccinated from "tubes" on same day.

Sub-vaccinees. None.

Course of vaccination. This was normal, and on 8th day there were three satisfactory vesicles. The mother stated that acting on instructions she applied a bread poultice to the arm on her return home from the station (on March 25th) and continued to apply poultices several times a day until 28th, when she dressed the places with cold cream. The Public Vaccinator, however, did not remember ever giving such direction, which was opposed to his practice and directly contrary to printed instructions which are handed to each parent. No shield was used, but a silk handkerchief was bound over the arm. The places scabbed over, and the mother did not notice anything wrong with the arm.

Course of illness. During week ended April 5th, the child suffered from internal pain, and on the 6th (19th day after vaccination) it was attacked with convulsions, and then the mother observed redness of the arm from shoulder to elbow, swelling of one finger, a red spot on nose, and one or two swellings in other parts. A doctor was called in, and attended the case to the end, but refused to certify. He deposed at the inquest that the arm was "frightfully inflamed," and that in his opinion the child was not in a fit state to be vaccinated, and that the vaccination was responsible for the death.

Post-mortem examination. Weight of body, 6 lbs. 11 oz. Three circular healing ulcers on left upper arm at sites of vaccination, with two recent abrasions in the vicinity and one or two small blebs, the skin inflamed and thickened to one inch below elbow. No enlarged glands. Second finger of left hand thickened and discoloured, patch of recently inflamed skin on nose; several recent abrasions on the buttock. Purulent pericarditis and peritonitis. The pathologist considered that death was due to "general septic poisoning arising from absorption of some septic material at an abraded surface."

Previous health of child. The mother said that although small the infant was in good health prior to vaccination. Some weeks previously it had been treated for ophthalmia at an infirmary, and had quite recovered from that. Two months before it had an attack of convulsions.

Family history. Of other members of family, three children are living, ages 11, 9, and two years; the first stunted in growth, second not very strong-looking, and third [illegible]ough

* *This case is also amongst those brought to the notice of the Commission with a view to their investigation; being the same as that numbered as Case 22 on page 229. The case was not, however, investigated by a medical man on behalf of the Commission.*

fairly healthy, is rachitic. Three have died; one at three years ten months from concussion after a fall; the second at two years three months, of "peritonitis;" and third at one year two months of "teething."

Not sanitary: and sanitary inspector gave evidence in support of the defective sanitation of the houses in the street.

The vaccination was normal, and no bad symptoms occurred until 15 or 16 days after the operation, when, whether owing to the treatment (by poultices and applications) or not, septic material may have gained entrance into the wound, leading to fatal pyæmia. The insanitary state of the dwelling must have exposed the child to sources of infection, and it is possible that the latter's constitutional debility may have favoured the course taken by the illness.

[S. C.]

CASE CVI., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated 22nd April* 1890.)

M. W., male, aged five and a half months at time of vaccination.

January 13th, 1890.

March 13th, 1890.

"Vaccination 46 days; erysipelas of arm and "shoulder seven days; broncho-pneumonia four days."

Stored in a tube obtained from a neighbouring public vaccinator. Source not recorded.

Two children vaccinated from same batch of lymph. Both vaccinations normal.

None. Vesicles not opened.

Normal till about the end of third week, when a scab was rubbed off through the use of a shield. Arm became red and swollen. Inflammation spread from shoulder to fingers, but quickly subsided under treatment. By March 5th the arm had healed.

February 18th or 19th (three weeks after vaccination) child took cold. February 24th child had bronchitis. Mr. N. was called in on account of the bronchitis, when he also saw and treated the injured arm. Subsequently broncho-pneumonia supervened and child died March 13th.

A shield was used causing injury to the arm.

Reporter considers that death was "due to broncho-"pneumonia, and not to erysipelas," although the latter may have been an accelerating cause. He believes that the erysipelas was in all probability due to infection of the wounds by the vaccination shield, and not to any fault in the method of vaccination.

[T. D. A.]

CASE CVII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY ONE OF THE BOARD'S INSPECTORS.*

(*Report dated 7th May* 1890.)†

C. W. W., male, aged six months.

March 12th, 1890.

April 1st, 1890.

"Pyæmia."

CASE CVII*a*., REPORTED TO THE LOCAL GOVERNMENT BOARD BY ONE OF THE BOARD'S INSPECTORS.*

(*Report dated 7th May* 1890.)†

W. W. B., aged three months.

March 20th, 1890.

April 13th, 1890.

"Convulsions."

* *These cases are also amongst those brought to the notice of the Commission with a view to their investigation; being two of the same group of connected cases as that numbered as Case 23 [Series] on page 229.*

† *As the Commission have made inquiry into the circumstances of the group of connected cases of which these two cases form part, it has not been thought necessary to give here an analysis of this report, which is printed in full on pages 234–40.*

CASE CVIII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR. $\frac{A\,Ac}{1}(1)$.

(*Report dated 13th May* 1890.)

C. E., female, aged 14 weeks. *Case of.*

April 9th, 1890, by Mr. W., privately, in four places. *Vaccination.*

April 23rd, 1890. *Death.*

"Vaccination, 14 days; erysipelas, three days." *Certified cause.*

Mr. W. *Certified by.*

Calf lymph, one of six tubes, said to have been procured originally from Dr. A. of M. (U.S.A.) supplied to Dr. W. by Messrs. W. & Co. who obtained them from Mr. F. *Source of lymph.*

Seven children besides C. E. were vaccinated from five of the tubes thus obtained. The sixth was sent by reporter to Local Government Board. *Co-vaccinees.*

In four vaccination was normal.

In three it proceeded irregularly. In all there was excessive inflammation, in two the limb was swollen and hard, and in one of these, according to the mother's statement, the vaccination did not begin "to take" until 8th day.

Note.—Eighteen other tubes of lymph were purchased by Messrs. W. & Co. at the same time as the six obtained for Dr. W. Seventeen of these had been supplied to eight vaccinators; seven of these recorded normal results. One stated that "he had some trouble "with the arm afterwards." One tube was unaccounted for.

By inference none. *Sub-vaccinees.*

On 6th day (April 14th) slight redness round pocks. On 9th day vesicles broken and "a brawny swelling "extending from the vaccination site to the elbow." On 11th day (April 19th) redness had extended to wrist, chest, back, and right arm. On April 22nd "pulmonary symptoms supervened," and on April 23rd the child died. At death one vesicle remained "with "small blebs around it, the others had become ulcerat-"ing surfaces." *Course of vaccination and illness.*

Not stated. *Treatment of vesicles.*

Instrument "shaped like a hare-lip needle" used, with "glass head for rubbing in the lymph." This was clean and in good order. Vaccinator stated "he "used every precaution of cleanliness in operating." For a fortnight previous to March 21st had attended a case with "facial erysipelas," and from April 7th to 16th a case of erysipelas which proved fatal. This case he had visited earlier on the day on which he vaccinated the deceased, and one of the co-vaccinees whose vaccination presented abnormal symptoms. *Method of vaccination.*

Note.—Of the eight children vaccinated with this lymph *five* were vaccinated during the period that Dr. W. was attending this case of erysipelas, one on the day following his last attendance; *four* of these suffered more or less severely from erysipelas. The other two cases vaccinated with the same lymph a week later did well.

Good. *Previous history.*

Good. *Family history.*

Good, as far as it could be ascertained. *General surroundings and sanitary condition.*

Reporter concludes "that Dr. W. did somehow or "other convey infection of erysipelas from the parti-"cular patient to certain of the infants vaccinated by "him at the period, although how he did this, he is "unable to say." *Conclusion.*

[T. D. A.]

Ac/O (3).

CASE CIX., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated 28th May* 1890.)

Case of. H. W. W., male, aged 3 months 19 days.

Vaccination. April 3rd, 1890, by Mr. T., Public Vaccinator.

Death. April 30th, 1890.

Certified cause. "Vaccination 27 days. Erysipelas five days. Convulsions one hour."

Source of lymph. Humanised lymph, one remove from calf, from infant F. stored in tubes since March 31st.

Vaccinifer. Healthy child. Vaccination normal.

Co-vaccinees. One only recorded. Vaccination normal. Several others stated to have been successfully vaccinated from tubes of same lymph. Numbers and details not given.

Sub-vaccinees. Eight. Vaccination normal in all. In one the arm had been rubbed and the healing of the vesicles delayed.

Course of vaccination. Stated to have been normal until April 21st, *i.e.*, for 21 days.

Course of illness. April 24th redness appeared round one scab. Next day when seen by Mr. T. redness extended for about 1½ inch around this scab, but did not involve the other two: there was no swelling and no enlargement of glands. The inflammation continued to spread and attempts were made to limit it by application of nitrate of silver. On April 27th this treatment was applied by Mr. T.'s unqualified assistant with such severity that the surface became raw and blistered. On the morning of April 30th the child was seized with a convulsion and died in about an hour.

Treatment of vesicles. A shield was used, which had been washed and recovered since previously used. It is stated that the arm had not been rubbed.

Previous history. Not stated.

Family history. Not stated.

Method of vaccination. A clean lancet used.

General surroundings. Satisfactory. No known infectious disease in the neighbourhood.

Summary of reporter's conclusion. The reporter concludes from the evidence "that the "lymph employed in the vaccination of W., and the "manner in which the operation was performed," must be excluded from being directly concerned in the child's illness and death. He considers the erysipelas was probably due to the use of the shield, and that it was aggravated by the treatment used to check it. Mr. P., the vaccinator, concurs in this opinion.

[T. D. A.]

G/O (2).

CASE CX., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated 13th May* 1890.)

Case of. A. H. P., male, aged five months.

Vaccination. September —? 1889.

Death. January 22nd, 1890.

Certified cause. "Effects of vaccination three months. Ulceration of "bowels seven days."

Source of lymph. Uncertain. No record kept.

Co-vaccinees. Uncertain.

Sub-vaccinees. Not stated.

Course of vaccination and illness. Normal up to 8th day, one vesicle having formed. The scab was removed subsequently, but whether naturally or by accident could not be ascertained. An ulcerated surface was left exposed upon which a large bleb formed. This subsequently ruptured, discharged, and later a crust formed over the place. At the same time the child's forehead and scalp became swollen and covered by an eruption (porrigo) similar to that on the vaccination sore. The child's condition did not improve. A week before death he suffered from continuous diarrhœa and vomiting.

Treatment of vesicles. Various applications were made under medical advice.

Previous history. Nothing of importance is stated.

General surroundings. During the last months of child's life very satisfactory, but previously its surroundings had been insanitary.

Summary of reporter's conclusion. None given by the reporter, who, however, notes that the practitioner who gave the certificate of the cause of death holds the view that ulceration of the duodenum follows "scalp eruption," and that he signed the certificate relying solely on the father's statement in accordance with this theory without making any examination of the child.

Death appears to have been due to acute gastro-enteric catarrh supervening on a severe attack of porrigo or impetigo, which, according to the report, originated in and round the vaccination vesicles.

[T. D. A.]

CASE CXI., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

G/1 (

(*Report dated 6th June* 1890.)

Case E. G., female, aged seven and a half weeks.

Vaccination. April 22nd, 1890, by Mr. B., deputy of Public Vaccinator.

Death May 17th, 1890.

Certified cause "Vaccination, acute eczema," with an explanatory note that the meaning was that the child had died of acute eczema following vaccination.

Source of lymph Arm of child L. L. B.

Vaccifer. A healthy child, who had been vaccinated with human lymph obtained from Mr. F. Vaccination normal.

Co-vaccinees Two:—

1. *J. H. C.* Vesicles formed and ruptured by the second day. Inflammation spread down the arm to elbow and down the side. On the 7th day a vesicular eruption appeared round the points of inoculation. The child eventually did well.

2. *A. S.* The arm was "all raw" on the second day, and subsequently inflamed from shoulder nearly to elbow. Over this area there was an eruption of small vesicles. This child's sister, aged two, was permitted to wear a nightdress which had become contaminated with discharge from the vaccination sores. Her arm became inoculated, and little "mattery heads" formed at the spot, leaving a livid scar. A few vesicles developed on other parts of the body.

Sub-vaccinees None.

Course of vaccination and illness Mr. B. states that on 8th day vesicles were broken and looked as if they had been rubbed.

On the 10th day two vesicles appeared on the left cheek. The arm was stiff and sore and there was induration round the vesicles and in the axilla. Next day the child had general acute eczema. On the 14th day the discharge from the eczematous eruption had dried into crusts and no part of the body was free. It was unable to take the breast and died the following day.

Previous history. The child was only a month old when vaccinated It was the eleventh child, and is said by the vaccinator to have been ill-nourished.

Family history. Nothing of importance recorded.

There are three appendices to this report:—

1. A cutting from the *B—— Guardian* of May 19th, 1890, giving an account of the meeting of the Board of Guardians, at which a resolution was passed to the effect that "the condition of the child was not produced "from any fault in the lymph, and that death was caused "by eczema following but not caused by vaccination."

2. A letter from the vaccinator.

3. A letter as to the source of the lymph. Neither of the latter contain any information material to the inquiry.

Summary reporter's conclusion The reporter considers that there is no doubt that the child's death was due to acute eczema, but whether the eczema was caused by the vaccination he considers doubtful.

Note.—All the three children vaccinated with the same lymph appear to have suffered more or less acutely.

[T. D. A.]

CASE CXII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated 27th June* 1890.)

H. E. M., male, aged 10 months.

About January 4th, 1890.

February 8th, 1890.

"Epileptic convulsions since birth. Exhaustion "following vaccination 5 weeks."

Calf, procured from Dr. R. in December 1889.

Number and results not stated. Two children known to have been vaccinated with lymph from the same source are believed to have done well.

None. Vesicles not opened.

A vesicle formed at only one of the two points of inoculation. The child's mother states that the vesicle did not appear until the 8th or 10th day. The vaccinator states that it appeared quite normal on the 8th day. Three or four days later a broad raised and inflamed ring developed round the crust which was forming, it became livid, hard, and gangrenous. The mother states that a bright red blush appeared subsequently on the body, chest, and thighs, a few small white blisters developing on the chest. This vaccinator did not see this eruption, which was followed by vomiting, diarrhœa, convulsions, and death.

The vesicles were covered with wadding soaked in vaseline and (?) iodoform. A shield was used which when seen was stained with purulent discharge and foul smelling.

Bad. The child was born blind and had been ailing from birth. He had "distinct fits" when three months old; but had had "gaspings and twitchings before this." Vaccination had been twice postponed in consequence.

Very bad. Mother has had four still-born children. One died aged three days in a "fit"; one aged three weeks of "bronchitis."

During the week after vaccination the mother being ill the child was nursed by a young sister.

The vaccinator believed that the child died of septicæmia. The reporter considers it difficult to say how the septicæmia was set up, but he is of opinion that the child's being nursed by a young sister while the mother was ill and the use of a shield soaked in discharge and ill-smelling were elements of danger.

Note.—The previous ill-health of the child and its bad family history cannot be disregarded.

[T. D. A.]

CASE CXIII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated 30th June* 1890.)

E. W., female, aged four months, No. 476 in register.

May 13th, 1890. By Dr. E. R., Public Vaccinator.

June 4th, 1890.

"Vaccination, erysipelas."

Not stated.

Direct from arm of L. H., No. 388 in register.

Healthy child. Vaccination normal. Four normal cicatrices.

Nine, Nos. 467–475 in register. In eight, vaccination was normal; in one (H. B., No. 472) three out of four insertions were successful, one vesicle healed normally, two "had got rubbed and were not healed on June 24th" (six weeks after vaccination). Two of the above children, Nos. 469 and 474 were successfully used as vaccinifers.

None.

Two vesicles formed at four points of insertion on 8th day, these were rubbed and broken. Vaccinator noted in his register that the arm had been badly rubbed.

During 2nd week the arm began to inflame. The inflammation gradually spreading to trunk, but not to legs. The child died on the 23rd day. *Course of illness.*

Poulticed after 8th day by order of vaccinator. *Treatment of vesicles.*

A simple lancet in fixed handle was used. The vaccinator is stated to be careful. *Method of vaccination.*

Child reported by mother to have been healthy, but appears to have been anæmic. *Previous history.*

Believed to be good. *Family history.*

Father out of work. Mother and family ill-fed. *General surroundings.*

Nothing of importance stated. Erysipelas not prevalent at the time. *Sanitary surroundings.*

The child died of erysipelas spreading from the vaccination wounds. The reporter is of opinion "that in "the absence of any positive evidence the precise source of the erysipelas remains doubtful. *Summary of reporter's conclusion.*

Note.—This case is classified with cases in which injury to the vesicles presumably started the erysipelas. The evidence shows only that on the 8th day the vesicles were broken, and according to the note made by the vaccinator had been "badly rubbed."

[T. D. A.]

CASE CXIV., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR. $\frac{Ac}{2}(2.V)$.

(*Report not dated.*)

A. A., male, aged 11 weeks. *Case of.*

April 29th, 1890, by Mr. F. W. W., Public Vaccinator. *Vaccination.*

May 28th, 1890. *Death.*

Not stated. *Certified cause.*

Direct from arm of child S. N. *Source of lymph.*

A pale, thin child not "obviously unhealthy." Vaccination believed to have been normal. Four healthy cicatrices. *Vaccinifer.*

One. Vaccination normal. *Co-vaccinees.*

Five; vaccination normal in all. *Sub-vaccinees.*

On the 8th day vesicles looked healthy. On 9th day arm began to swell and child seemed poorly. Five days later there was cutaneous erysipelas of the arm which four days afterwards had spread to trunk, and scrotum, one side of which sloughed. Child died exhausted. *Course of vaccination and illness.*

The vesicles were not injured. After the arm began to swell the vesicles were dressed with fresh cream by the mother. *Treatment of vesicles.*

Child stated by mother to have been healthy. *Previous history.*

Nothing of note reported. *Family history.*

Mother suckled her child, and appears to have been careful of it. There is stated to have been enteric fever in the house two years previously, and numerous cases in the neighbourhood. Reports respecting the prevalence of erysipelas at the time are conflicting. *General surroundings.*

Bad. There is a small yard common to several houses, pavement broken, earth sodden with black offensive filth. Two privies with cess pits only 12 feet from Mrs. A.'s windows. The pump in next yard for drinking water, 20 feet from a privy midden "built against "a house and much complained of." Ventilation of cottage very inadequate. *Sanitary condition.*

Child was washed with rain water.

Not stated. Vaccinator said to be careful. *Method of vaccination.*

Reporter concludes that successful vaccination of five children from child A.'s arm "shows that there was "nothing wrong" on 8th day; he frees the vaccinator from blame, and considers that the fatal illness was caused by septic matter entering the wound at some time subsequent to the lymph being taken from it. *Summary of reporter's conclusion.*

[T. D. A.]

Ac/3(5).

CASE CXV., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated 7th August* 1890.)

Case of. F. W. R., male, aged 5½ months.

Vaccination. May 19th, 1890. Public Vaccinator.

Death. July 2nd, 1890.

Certified cause. "Vaccination; erysipelas seven days."

Source of lymph. From arm of child D. stored in tubes on May 5th.

Vaccinifer. Healthy. Vaccination normal.

Co-vaccinees. Four. Vaccination normal in all.

Sub-vaccinees. Not stated; by inference none.

Course of vaccination. On 8th day "very little redness" round the wounds. Two of the vesicles only scabbed over and healed, the third did not scab over properly but remained an open sore, but superficial and inflamed.

Course of illness. On June 24th (37th day) mother noticed the arm looked "red and angry;" next day it was "swollen "and looked worse." The child was seen by Dr. W. who found erysipelas on the left arm; this subsequently spread to the fingers, shoulder, and over the trunk. On July 2nd the child died from exhaustion.

Treatment of vesicles. Mother stated vesicles were not rubbed or injured. She dressed them with "house leek" and cream applied with a feather; also with castor oil.

Method of vaccination. Satisfactory.

Previous history. Not stated.

Family history. Reasonably good and unimportant to this inquiry.

General surroundings. House clean. Sanitary arrangements satisfactory. Scarlatina appears to have been prevalent in the village at this time. Father the conductor of a Sunday school; several of the scholars had had scarlatina. No illness in the house.

Summary of reporter's conclusion. Reporter gives no summary. Dr. W. who attended the child states "he does not think the erysipelas poison "was introduced into the arm by vaccination," but that "later the unhealed place on the arm afforded a "point of entrance for the disease;" he draws attention to the prevalence of scarlatina at the time and in the immediate vicinity of the child's home.

[T. D. A.]

Ac/1(3).

CASE CXVI., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated 6th August* 1890.)

Case of. E. A. C., female, aged four months.

Vaccination. April 30th, 1890, by Dr. W. M. R., Public Vaccinator.

Death. June 14th, 1890.

Certified cause. "Erysipelas after vaccination."

Source of lymph. Lymph stored in tubes from arm of child, No. 399 in register. Vaccinated March 13th, 1890.

Vaccinifer. Slight redness on 3rd or 4th day, but at no time did the inflammation extend, and was "only just round "the places." About the time the wounds healed "a red "rash" appeared which gradually extended over trunk and extremities; pronounced by doctor who saw the child to be "erysipelas." The wounds, however, healed well and the child recovered.

Co-vaccinees. Two. Vaccination normal in both. In one the healing of the wounds was *slightly* delayed, the child having pulled off one of the scabs. The mother of the other child was attacked with erysipelas of the face on the 7th day after the child's vaccination. The child, however, was removed and did not suffer.

Sub-vaccinees. None.

Course of vaccination. Mother states there was slight redness around wounds on the 2nd day; by the 8th this extended to nearly elbow and shoulder. The inflammation subsequently subsided, the places healed, and the scabs separated normally about the end of the 3rd week.

The day after the scabs separated a red blush appeared on shoulder of vaccinated arm; the redness continued to spread over body and extremities and the child died exhausted on the 46th day after vaccination.

Vesicles opened on 8th day. No shield was used. Child wore a pink cotton dress, but the mother states the wounds were covered with white muslin.

"Cooper Rose's" vaccinator used, disinfected between each vaccination by dipping into a solution of carbolic acid. On inspection the points were found fairly clean, but slightly rusty towards their bases.

Not stated.

Not stated.

Child lived in "small old cottage."

Both scarlet fever and erysipelas were prevalent in the district at the time; 124 cases of the former and 25 cases of the latter having been notified between January 1st and July 1st 1890. Possible infection from this source appears to have existed in the person of an old woman who was frequently consulted about the child C., and who was known to have visited an erysipelas patient, although she states she had discontinued her visits at this time.

The reporter concludes that the erysipelas from which the child C. suffered was due to its prevalence and to the prevalance of scarlet fever in the neighbourhood at the time, vaccination being concerned only so far as to afford "the breach of surface for the reception of the "poison." [T. D. A.]

CASE CXVII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated 6th August* 1890.)

J. M., male, aged three months.

January 14th 1890, by Mr. H. W. N., Public Vaccinator.

February 8th, 1890.

"Erysipelas after vaccination 12 days, Gastro-en-"teritis 24 hours, convulsions 6 hours."

Mr. C.

Child No. 132 in register.

Vaccination normal. Cicatrices normal.

Nine. Vaccination in all said to be satisfactory. Reporter, however, states that in all the vaccinations performed about this time from whatever source there appears to have been some excess of inflammation. In two of the co-vaccinees the vesicles burst by 8th day; in one of these there was early and considerable inflammation, but arm healed well within a month, and child was not ill.

Seven. All did "fairly well," no complications, arms healed duly.

7th day, some inflammation.

8th day, inflammation according to mother extended nearly from shoulder to elbow. During 2nd week inflammation spread to both arms, trunk and extremities. Well-marked erysipelas on 14th or 15th day; scabs separated, leaving deepish sores; some enlargement of axillary glands, but no abscess. Child subsequently suffered from diarrhœa and convulsions, and died exhausted on 26th day.

Not stated.

Not stated.

Not stated.

Father and mother and six children lived in one small dirty room. Scarlet fever in two houses close by, one only 30 yards distant.

By inference bad.

Ordinary lancet used, cleansed with water between each case. Clean when seen. Vaccinator not sufficiently careful as regards use of lymph from inflamed arm; ignorant of any source of septic infection about person or clothes. Vaccination station a large schoolroom, ill-ventilated, with faulty drainage.

Reporter concludes that "the dirt and scarlatina "poison present in the immediate vicinity probably "both played an important part in causing the attack "of erysipelas," and that possibly "inflamed arms "may be more susceptible to injurious influences than "others." [T. D. A.]

CASE CXVIII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE CLERK TO THE GUARDIANS.*

(Report dated 16th August 1890.)

M. W., male, aged five months.

April 26th, 1890, by Dr. M., Public Vaccinator.

May 15th, 1890.

"Septicæmia."

Dr. M., Public Vaccinator.

Direct from arm of child, No. 155 in register.

One of ten children vaccinated April 10th with humanised lymph (from child No. 135,) stored in tubes. Vaccination normal until 8th day. During next few days there was diffused inflammation of vaccinated arm extending from shoulder to elbow, which did not subside for a week. About 14th day child's eyes became inflamed, one soon got well and no medical treatment was adopted for a fortnight: by this time the other eye was permanently injured, and there was anterior staphyloma.

In the nine other children vaccination was normal and without complication.

Six children, according to register (Nos. 168-173), were vaccinated from No. 155.

One (No. 174) on same day from another source, (No. 162).

One only of all seven cases pursued a normal course. Two suffered from a minor degree of inflammation after 8th day.

Four did badly. In three cases the vesicles burst before the 8th day, and the arms were early inflamed, one of these also suffered from axillary abscess. The fourth is the subject of this report.

None.

Redness noticed round points of inoculation on day of vaccination.

By 3rd day vesicles had formed and were discharging. By 8th day inflammation had extended to neck and to below elbow.

Inflammation continued to spread and child died from exhaustion on 20th day.

Nothing of importance noted.

Cooper Rose's needle used. Its condition noted as satisfactory. It was cleansed after each vaccination. Vaccinator said to be careful in disinfecting his hands.

Good.

Nothing of importance noted.

Two cases of erysipelas were notified in the village the end of April. One case came to vaccinator's surgery; but whether before the vaccination or not, is uncertain. Vaccinator visited another case of severe erysipelas on April 25th.

By inference bad. Sixty-three cases of enteric fever notified in preceding four months.

Nine cases on April 20th.

The child died of erysipelas. All but one of its co-vaccinees suffered from abnormal results of vaccination. Reporter is of opinion that the most reasonable explanation of what occurred is that the cause of the mischief did not reside in the lymph but was something altogether independent of it, which came into operation at the surgery on April 26th.

Reporter suggests as a possible hypothesis that the one normal case above referred to may have been the one vaccinated with lymph not derived from No. 155. There is no proof that this was the case, and supposing the infection to have started from No. 155, No. 174 might easily have suffered as well as the other children although vaccinated from another source, since a Cooper Rose needle was used, a most dangerous instrument under these circumstances.

[T. D. A.]

CASE CXIX., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REG'STRAR. **O4. E**

(Report dated 23rd August 1890.)

S. J. M., male, aged six months. *Case of.*

December 18th, 1889. By Dr. M., Public Vaccinator. *Vaccination.*

March 12th, 1890. *Death.*

Not certified. Registered by permission of coroner as "Measles, 2 weeks; abscess, stated to arise from "vaccination." *Certified cause.*

From child S. *Source of lymph.*

Child in good health. No details given. *Vaccinifer.*

Two. In one vaccination unsuccessful; in the other stated to have been normal. *Co-vaccinees.*

Not stated. *Sub-vaccinees.*

Normal. *Course of vaccination.*

Three or four weeks after vaccination two or three little abscesses formed, broke and healed on scalp. Later a boil on buttock, unhealed at time of death.(?) Towards end of February child caught measles from elder sister. No advice sought. On March 12th mother went out for a couple of hours and on return found child dead. Post-mortem examination revealed nothing of importance except "excessive amount of "fluid in the pericardial sac," which the vaccinator considered was the cause of death. *Course of illness.*

Child lived in a "squalid, dark, and ill-ventilated "room," and was ill cared for. *General surroundings.*

None given. *Summary of reporter's conclusion.*

[T. D. A.]

CASE CXX., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR. **Ac (3). 1**

(Report dated 29th August 1890.)

J. W. E., male, aged four months. *Case of.*

April 17th, 1890, By Dr. H., Public Vaccinator, in four places. *Vaccination.*

May 24th, 1890. *Death.*

"Erysipelas, one month." *Certified cause.*

Mr. C. McK., partner of Dr. H. *Certified by*

From child No. 308 in register. *Source of lymph.*

Two vesicles burst on 7th day, presumably from being rubbed. Areola one-eighth of inch during second week. At this time child injured *opposite* shoulder and side of neck by a fall; an abscess formed in neck on injured side and broke about 22nd day after vaccination. Both mother and doctor attributed the abscess to injury from the fall. *Vaccinifer.*

Seven. All had more or less inflamed arms; one had axillary abscess; another had early and severe inflammation of arm, and vesicles burst about 5th day. *Co-vaccinees.*

Note.—One of these children sickened with whooping cough the day it was vaccinated, the other lived near a house where three weeks before there had been a case of erysipelas.

None. Vesicles not opened. *Sub-vaccinees.*

By 8th day one out of the four vesicles had burst, areola one-eighth of inch. This subsided. 10th day axillary swelling observed. This broke about 15th day. Later, date uncertain, a blush was observed round axillary abscess according to mother's statement, round the vaccination places according to Dr. McK. This spread to trunk, extremities, and head; child suffered from convulsions and died on 37th day after vaccination. *Course of vaccination and illness.*

No shield used. No coloured clothing worn. Poultices applied to vesicles by doctor's advice. *Treatment of vesicles.*

Not stated. *Previous history.*

Not stated. *Family history.*

Not stated. Some cases of scarlet fever in next street; possible infection from people frequenting the shop *General surroundings.*

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* *This case is also amongst those brought to the notice of the Commission with a view to their investigation; being one of the same group of connected cases as that numbered as Case 30 [Series] on page 246.*

kept by child's mother. Child always with mother in the shop. During and after February a severe case of erysipelas had occurred at a neighbouring house, doctor had to pass through another house to get to this one, and to this latter house the child had been taken on its way to and from the vaccination station.

Sanitary condition. Not stated.

Method of vaccination. Not stated, except that "Public Vaccinator has apparently not strictly adhered to the Board's instruction as to avoiding the use of children as vaccinifers whose arms showed conspicuous areola." Vaccinations performed in surgery "atmosphere of which is constantly open to the chance of septic infection."

Summary of reporter's conclusion. Reporter gives none, but notices specially the "tendency to undue inflammation" occurring in the practice of this vaccinator; and he considers that whatever its origin it is to "be regarded as a matter not outside his control."

[T. D. A.]

B/1(2). CASE CXXI., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE REGISTRAR-GENERAL.

(*Report dated 19th January* 1891.)

Case of. T. W. A., male, aged one month (less four days).

Vaccination. December 25th, 1889. By Dr. G., Public Vaccinator at —— Hospital, child being then not two days old.

Death. January 19th, 1890.

Certified cause. "Pyæmia, two weeks; asthenia."

Certified by. Dr. A. R.

Source of lymph. No record.

Co-vaccinees. Ten. No record, but stated by Dr. G. to have done well.

Sub-vaccinees. Not stated.

Course of vaccination and illness. Vaccination stated by Dr. G. to have been normal on 14th day. Mother and child were then discharged from the hospital. Dr. R., medical officer of home into which they were received on leaving the hospital, states the child had "excavated unhealthy sores at the vaccination places." Subsequently abscesses formed on fingers and child died exhausted.

Previous history. Seven months child, weight at birth 4 lbs. 2 oz. Described by Dr. R. as "puny and probably syphilitic."

General surroundings. Child was born in —— Hospital and on discharge admitted into —— Home.

Summary. Reporter concludes the unfavourable course of the vaccination "would seem to have been due mainly to "the child's weakness owing to its premature birth," and further suggests that "in the puerperal atmosphere "in which the child was nursed there may have been "present septic matter capable of setting up fatal "pyæmia."

[T. D. A.]

Ac/2(2). CASE CXXII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated 31st September* 1890.)

Case of. F. C., male, aged four months.

Vaccination. February 11th, 1890. By Dr. P., private practitioner, in one place only.

Death. March 7th, 1890.

Certified cause. "Erysipelas one week, from cold in the recently vaccinated arm."

Certified by. Not stated.

Source of lymph. Direct from arm of child, of whom no record kept.

Co-vaccinees. Two. No record of whom kept.

Sub-vaccinees. Not stated.

Course of vaccination. Normal up to day of inspection, a bitterly cold day, with east wind.

Course of illness. Two days after inspection, vaccinated arm began to inflame, commencing at vaccination wounds, and spreading to trunk. No details given.

Treatment of vesicle. Bread poultices applied. No shield used.

Previous history. Not stated.

Family history. No facts bearing on child's death given.

General surroundings. Satisfactory; no known infectious disease in neighbourhood.

Sanitary condition. Privy middens said to be in "too close proximity."

Method of vaccination. Not stated. Vaccination cases and ordinary cases attending surgery at same time.

Summary of reporter's conclusion. Report is meagre. No facts indicating the origin of the erysipelas are given.

[T. D. A.]

CASE CXXIII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR. **Ac/2(V)**

(*Report dated 4th September* 1890.)

Case. P. F. S., male, aged three months.

Vaccination. July 2nd, 1890, by Mr. A. B., Public Vaccinator.

Death. July 29th, 1890.

Certified cause. "Vaccination, 1 month; erysipelas 3 weeks.

Certifier. Mr. B.

Source of lymph. Human lymph from child C. M. B. stored in "new tubes" collected April 23rd, 1890.

Vaccination. No excess of inflammation. Normal cicatrices.

Co-vaccinees. Four.
In *two* vaccination absolutely normal.
In *one* "some extended redness" on 8th day, but arm healed naturally.
In *one* redness extending to shoulder during 2nd week; scabs injured and discharged, but ultimately healed.

Sub-vaccinees. Ten.
In *seven* vaccination absolutely normal, although in one of these scabs got knocked off and healing was somewhat delayed.
In *three* some excess of inflammation, but places healed normally.

Course of vaccination and illness. 8th day vesicles normal, no excess of areola.
10th day redness on child's shoulder.
17th day erysipelas extending to shoulder and chest. Vesicles scabbed and not discharging. Some enlargement of axillary glands.
24th day erysipelas extended to scrotum and thighs.
26th day erysipelas extended to feet.
28th day child died. Mother states wounds healed and scabs fell off before child's death.

Treatment of vesicle. No shield used. Bread poultices applied.

Previous history. Not stated.

Family history. Three older children healthy.

General surroundings. Sitting-room communicated with cupboard in which "foul clothes" and "filthy articles" appeared to be kept. No illness in house.

Sanitary condition. No proper drainage. Constant bad smells. Offensive pigsties with "heaps of pig manure, excrement, and "rubbish" 18 or 20 yards distant from cottage. Scarlet fever prevailed in neighbourhood at the time.

Method of vaccination. "Needle-point" instrument and grooved lancet used, not in good condition. Vaccinator stated to be careful in his choice of vaccinifers.

Summary of reporter's conclusion. Child died of erysipelas. Reporter concludes the erysipelas was due to absorption of septic matter into the open wounds, possibly from dirty bread poultices; whether this were so or not he considers the surroundings of the child's home amply sufficient to account for the result.

[T. D. A.]

CASE CXXIV., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR. **Ac/2(V)**

(*Report dated 22nd September* 1890.)

Case. E. E. W., female, aged —?

Vaccination. July 12th, 1890, by Mr. D., in two places.

August 27th, 1890.

"Vaccination, one month; erysipelas, two weeks."

Mr. D.

From child B.

No details given. B. was vaccinated July 2nd from tube of F.'s humanised lymph sent June 30th. Vaccination normal.

Note.—Two other tubes were obtained at same time, from which three other children were vaccinated; vaccination reported to have been normal, in all.

One. No details given, but vaccination states to have been normal.

Two. One could not be found. In the other vaccination stated to be normal.

Vaccination normal on 8th day.

On August 11th (30 days after vaccination) child seemed fretful, and "a red patch appeared below "one of the places," later "the whole limb be- "came swollen and red," this gradually extended to other arm, trunk, and extremities, and the child sank from exhaustion. It suffered from a "hacking dry "cough" shortly before death.

An ordinary grooved lancet used. Clean and well kept when inspected. Source of lymph and records of vaccinations accurately kept. Reporter considers Mr. D. a careful vaccinator.

Mother applied cold cream to help "the falling off of "the scabs."

No illness before vaccination. Child appeared to be healthy.

Not stated.

Child nursed throughout by mother. No illness in child's home. No known exposure to infectious disease. Six cases of enteric fever and 12 of various infectious diseases were notified in the town during June, July, and August, but no connexion with any of these could be traced. Mr. D. notified two such cases, but he had discontinued his attendance upon the first ten days before child W.'s vaccination, the others he did not commence to attend until August 4th, a week before W. was taken to him with commencing erysipelas.

Bad. House much shut in. Sink-pipe in scullery connected directly with drain, fitted only with bell-trap. Scullery communicated with kitchen in which child frequently passed the day. A wooden pail in scullery "filled with vegetable and other refuse" and "emptied only once a week." Closet dirty and insufficiently supplied with water.

Reporter concludes that considering the satisfactory condition of the vaccination on the 8th day, the results of the lymph generally, and the satisfactory course of vaccination in W.'s vaccinifer and co-vaccinee, and in one (certainly) of the sub-vaccinees, together with the late appearance of the erysipelas, "acquittal of vacci- "nation as having produced the illness would seem "warranted." He regards the erysipelas as due altogether to an "extraneous source," and suspects the "gravely unwholesome condition of the house . . . . . "contributed some septic matter which caused the "child's fatal illness."

[T. D. A.]

CASE CXXV., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated* 1*st October* 1890.)

J. H. H., male, aged three and a half months.

July 8th, 1890, by Mr. W., Public Vaccinator.

August 21st, 1890.

"Vaccination; pyæmia."

Dr. D.

Direct from arm of child H., who was vaccinated with lymph from N. V. E.

"Plump, healthy child." Vaccination normal.

Ten. In *seven* vaccination normal.

In *two* excess of inflammation. In one a lump is stated to have formed near vaccinated places and to have broken. In the other the vesicles were injured Both arms healed in four weeks.

One could not be found.

Note.—Both children who had inflamed arms were exposed at the time to the infection of measles.

Not stated. *Sub-vaccinees.*

On 8th day vesicles normal; no inflammation. Scabs duly formed. End of 2nd week arm became inflamed. *Course of vaccination.*

Inflammation spread, involving chest, legs, and opposite arm. An abscess formed on left ankle and broke. Swellings formed also on right ankle and in axilla, but did not break. Early in August child had convulsions; it also suffered from diarrhœa, and sank from exhaustion August 21st. *Course of illness.*

No shield used. Arm not rubbed or injured. Mother applied house leek and cream to inflamed arm. *Treatment of vesicles.*

Not stated. *Previous history.*

Good, but a younger child had suffered from an abscess in her face when "quite young." *Family history.*

Good. There was, however, a great prevalence of measles at the time, although no direct contact could be traced. Also a few cases of scarlet fever, and five doors off a child was ill with "acute ulcerated sore "throat." *General surroundings.*

Fairly good. *Sanitary condition.*

Not stated. Reporter considers vaccinator "was "well acquainted with his duties." *Method of vaccination.*

Reporter concludes the erysipelatous inflammation from which the child suffered was in all probability due to "the contagion of measles which was so prevalent in "the locality at the time." He further points out "that the only two other cases out of the series done "on July 8th, known to have departed from the regu- "lar course of their vaccination were associated with "concurrent cases of measles in the house." *Summary of reporter's conclusion.*

[T. D. A.]

CASE CXXVI., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR. **$\frac{Ab}{2}$(3).**

(*Report dated* 16*th October* 1890.)

A. V. P., male, aged three months. *Case of.*

May 19th, 1890, by student, under Dr. E. S. G., Public Vaccinator and authorised teacher of vaccination. *Vaccination.*

July 26th, 1890. *Death.*

"Vaccination; abscess." *Certified cause.*

Dr. P. *Certified by.*

From arm of child T. N., No. 32 in register. *Source of lymph.*

Healthy child. Vaccination normal, "one head got "broken," and healing was delayed, but no excessive inflammation. *Vaccinifer.*

One. Vaccination normal. *Co-vaccinees.*

According to register none. Child's mother states tubes were charged and some three children vaccinated direct from her child. *Sub-vaccinees.*

Normal on 8th day. Wounds scabbed over and appeared to heal during 2nd week. One scab got knocked off, shortly after (about end of 3rd week) arm became inflamed, an abscess formed on back of hand, another above elbow joint, this latter was lanced June 24th by Dr. P. who describes case as "plegmonous "erysipelas." There was pain and hard swelling in axilla, but no suppuration. Child became worse and died July 26th. *Course of vaccination and illness.*

No details given. *Treatment of vesicles.*

Not stated. *Previous history.*

Not stated. But during child's illness mother suffered from sore throat, fever, and submaxillary abscess. *Family history.*

Not stated, but reporter "did not find any probable "source of infection." A case of erysipelas was present at the vaccination station on May 12th and reporter states this "shows that there was erysipelas about in "the neighbourhood." *General surroundings.*

Sanitary condition. Not stated.

Method of vaccination. With lancet kept specially for the purpose.

Summary of reporter's conclusion. Child died of erysipelas. Reporter considers evidence is against its having been contracted at vaccination station, and concludes it was probably due to "some "cause quite unconnected with vaccination" and "con- "tracted at or soon after" the injury to the scab.

[T. D. A.]

DD$_7$. CASE CXXVII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE REGISTRAR-GENERAL.

(Report dated 27th May 1890.)

Case of. W. A. W., female, aged nine months.

Vaccination. September 15th, 1889. Private.

Death. February 11th, 1890.

Certified cause. "Abscesses in axilla; convulsions."

The statement, made with reference to Case XCIII., that "it is more than likely" that the case "was one of "vaccinio-syphilis" is said by the practitioner who certified the cause of death in both instances to apply to this case and not to Case XCIII. as he had at first reported. (See Case XCIII.)

Source of lymph. Half a tube of fresh calf lymph used for co-vaccinee on the same day as received; the tube was re-sealed and used for W. A. W. next day.

Co-vaccinees. One. Vaccination normal.

Sub-vaccinees. Not stated.

Course of vaccination. The mother states that on the 8th day the vesicles were normal, but with considerable areola. This did not extend, and by the 6th week the scabs fell off naturally, and the scars were quite healed, and did not at any subsequent time break down again.

Course of illness. About this time, the 6th week, a swelling was noticed under the points of inoculation measuring 2 in. × 1 in. The child also appeared to have a cold. About the 10th week a rash, like pin points, appeared on chest and body, fading in two days without desquamation or discolouration. About the 12th week the swelling in the arm discharged pus from some small orifices in the neighbourhood of the vaccination scars, which, however, appear not to have broken down. This abscess, apparently seated in the deeper tissues, continued to discharge slightly until about the 16th week, when it ruptured and emptied itself completely, and subsequently partially healed. At this time, about the 19th week, another abscess formed in the axilla, which was opened. The child during this period had had "several "fits," and about the 20th week it had a violent convulsion, which occurred two days later, when it died.

Note.—The abscess was seen by Dr. S., who noticed nothing to suggest syphilis.

Previous history. Child fairly healthy, but not strong.

Family history. A brother and niece of mother suffered from tubercular disease. The mother's wrist was inoculated from the abscess on the child's arm; a pustule formed which discharged and healed up, having no induration, and followed by no swelling in the axilla, or rash on body.

General surroundings. Satisfactory.

Summary of reporter's conclusion. The reporter states as follows:—Dr. M., who signed the certificate, gave as his reasons for, supposing the case to be one of "vaccinio-syphilis" (*sic*)—

(1.) "The character of the wounds which remained "unhealed;" but according to mother's statement the vaccination wounds healed well and did not again break down.

(2.) "The history of a rash occurring three weeks "after vaccination;" the mother states that the rash appeared at least 10 weeks after vaccination, and before the axillary glands became enlarged.

(3.) "That the rash was preceded by a bubo;" this, again, does not agree with the mother's statement.

The reporter further points out that a practical test was applied by the inoculation of the mother's arm. She was not by it infected with syphilis, and there is no suspicion that she was protected by having previously contracted the disease. He expresses his opinion that the history is in many ways at variance with the hypothesis that the child was infected with syphilis, and he thinks that the case would be explicable on the supposition that the abscesses were of strumous origin, appearing after, but not in connexion with, vaccination.

Note.—The case seems to be one of septic infection, and might possibly have originated in the use of a tube of lymph which had been opened on the day previously.

[T. D. A.]

CASE CXXVIII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR. **AA 1**

(Report dated 21st October 1890.)

Case. R. C., male, aged two months.

Vaccination. June 27th, by Dr. McN., privately.

Death. July 25th, 1890.

Certified cause. "Erysipelas, after vaccination, 18 days."

Certifier. Dr. McN.

Source of lymph. Calf lymph "conserve" procured from Dr. H., of B., a fortnight before.

Co-vaccinees. Nine.

Two were vaccinated previously; these are stated to have pursued a normal course.

Seven subsequently; one on July 3rd, one on July 11th, two on August 26th, one on September 3rd, two on September 30th. In six the children are stated to have done well, although three suffered from some excess of inflammation. In one there was inflammation from shoulder to elbow, places did not dry up until 4th week, the scabs became detached and healing was delayed.

Note.—This latter child is stated to be strumous, and its surroundings bad. Mother, a dirty woman, applied cream with her finger to inflamed vesicles.

Sub-vaccinees. One. Child J. P. direct from arm of R. C. During 2nd week, arm inflamed from shoulder to elbow. Deep discharging sores treated with cream applied with finger, and cabbage leaves. Arm healed in about six weeks.

Course of vaccination and illness. Normal on the 8th day. 12th day child fretful, redness in the axilla; this soon extended to trunk and extremities, and slightly to face; child became exhausted, and died 29th day after vaccination.

Treatment of vesicles. Mother applied fuller's earth and poulticed vesicles on 12th day. No shield used. No coloured clothing worn.

Method of vaccination. A needle, supplied by Mrs. C., used, probably not new. Vesicles opened with a special lancet. The lymph "conserve" was kept in a bottle which had been previously opened for two vaccinations, and air, therefore, freely admitted.

Note.—Reporter calls attention to objections to the use of this preserved lymph, viz., (1) "the frequent ad- "mission of air to the vial;" (2) "the introduction from "time to time of some instrument for the purpose of "extracting lymph."

Dr. McN. was attending a case of scarlet fever, and one of septic character at the time, and had visited both these cases on the day he performed this vaccination.

Previous history. Not stated.

Family history. Not stated.

General surroundings. "Nothing in the condition of child's home or sur- "roundings likely to have given rise to the attack." No prevalence of infectious disease at the time; there were a few cases of scarlet fever; but not in the immediate neighbourhood, and no connexion with these (except that already noted) could be traced. Child was, however, taken in a tram car to the house of Mrs. C.'s mother, who was suffering from chronic ulcer of leg. Mrs. C.'s father also being ill with paralysis, unconscious and passing everything under him, atmosphere of room being consequently "in a very foul condition."

Summary of reporter's conclusion. Reporter concludes from the late appearance of the erysipelas, and from the normal result of the vaccination in the two children vaccinated previously to C., and in the child vaccinated seven days after him, with the same lymph, that the infection was probably due to some accidental cause, occurring on or after the 8th day, possibly to one or other of those mentioned above.

[T. D. A.]

CASE CXXIX., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated 8th November* 1890.)

E. M. A., female, age not stated.

September 23rd, 1889, by Mr. H., Public Vaccinator, in four places.

August 24th, 1890.

"Scrofula."

Mr. T., who further states that he considered "the "appearance of the rash . . . somewhat suggestive of "syphilis."

From child J. C.

Slight areola "about" 8th day, otherwise vaccination normal. Child apparently healthy.

Note.—With regard to the family history of this child, reporter states the mother had had three other children, but "no miscarriages." One child died at 18 months, of convulsions. One is a deaf mute. The other healthy, until attacked with whooping cough, which had left him weak, and he had subsequently suffered from "boils" or "abscesses."

Two. "Some degree of inflammation" round vesicles during the first week is reported in both cases, and some slight delay in healing of wounds apparently owing to scabs being rubbed off, but vaccination is stated to have been "satisfactory" in both children who were well, and had normal scars.

None. Two children, however, were vaccinated from the two co-vaccinees. These children are reported as healthy, their vaccination were normal.

On 8th day vesicles stated by mother not to have broken, but to have been a "nasty dark colour," these were never inflamed, but mother thinks skin around them was "dark blue." Subsequently the two upper places and then the two lower places coalesced. "With-" in a month" mother states a swelling formed in the axilla but did not break; later other swellings appeared, on body, head, and one on arms, dates not known. Dr. H., who attended the child, states that when first brought to him, October 17th, 1889, she was suffering from bronchitis. He describes the vaccination places as having had the scabs "rubbed off" and says there were "four large ulcers with elevated edges and thin dis-" charge—the area of inflammation hard." The arm, Dr. H. states, was healed about December 9th, 1889. Child is stated to have suffered from whooping cough early in 1890, and later on from chicken-pox, and also from boils. Dr. T. first saw child A. July 18th, 1890. He states that it was "much emaciated and unable to "retain food. The cervical lymphatic glands were en-"larged. There was a muco-purulent discharge from "both ears and the nose: eczema of the scalp, and "scattered pustules over the body:" these left "de-"pressed cicatrices, some almost as large as a shilling." The child "coughed up blood," and sank from exhaustion August 24th, 1890.

No evidence of any treatment likely "to have in-"juriously affected" the course of the vaccination.

Ordinary grooved lancet used, in good condition when inspected.

Child described as "full time and large child at "birth."

Mother had 14 children; no miscarriages. Ten living and mother stated to be healthy; one died of thrush at three months; one of scarlet fever at one year and four months, one of "bad liver" at one week.

One child had suffered from "spots about his feet "some time after vaccination," two had suffered from "some skin disease about the scalp."

House fairly clean. So far as is known not exposed "to any infectious disease."

"Offensive, and open privy about 10 yards from the "house."

Reporter gives no summary but states that Mr. H. is of opinion that although the child suffered from a "bad arm" after vaccination the condition was "a "purely local one" and that "she had completely got "over her vaccination in December 1889." Dr. H. considers that the child was "naturally delicate," and he attributes her death to prostration brought about by her many illnesses. He further states "that there is a "tendency to skin disease in the family, and also a "phthisical taint," and that "he cannot in any sense "associate the child's death with vaccination."

[T. D. A.]

CASE CXXX., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR. $\frac{G}{1}(1)$.

(*Report dated* 10*th November* 1890.)

Case of. B. H. D., female, aged 5¼ months when vaccinated.

Vaccination. October 3rd, 1890, by Mr. D., F.R.C.S., privately, in two places.

Death. October 16th, 1890.

Certified cause. "Vaccination; inflammation."

Certified by. Mr. D., vaccinator.

Source of lymph. From child F. A. V., stored in a tube and collected September 23rd, 1890. This lymph was second remove from calf.

Vaccinifer. "Plump, healthy child," said to have had a "typical "arm;" no inflammation, cicatrices normal.

Co-vaccinees. One. Vaccinated September 29th. Vaccination not wholly successful, one of three insertions failed, the other two produced normal, but small vesicles. Mother states there was "a good deal of inflammation around "the vesicles two or three days after inspection."

Sub-vaccinees. None.

Course of vaccination and illness. Slight redness around wounds "within an hour" of vaccination. This continued to increase. On 3rd day a "crop of blisters" appeared in the neighbourhood of the wounds, which broke and discharged "thin watery "fluid," this continued to inoculate and re-inoculate the surrounding surface until the whole "deltoid region "was occupied with running sores," which in appearance according to Mr. D. might have been mistaken for primary vaccine vesicles, broken and discharging. By 7th day vaccination vesicles had coalesced. Under Mr. D.'s treatment the arm improved, but the child grew worse. On the 13th day it suffered from convulsions, on the 14th day it died.

Treatment of vesicles. At first "a frequent change of handkerchiefs to the "arm." Subsequently arm treated by Mr. D. with carbolic acid lotion.

Method of vaccination. A "simple lance on a fixed handle used." Mr. D. states he is careful in cleaning the instrument. Mr. D. not in attendance upon "any case attended with viru-"lent discharge." The morning of the vaccination he extracted an "indolent" tooth stump, but this was not in a state of "active fetid decay."

Previous history. At time of vaccination said to be "healthy and "lively."

Family history. Mother "rather delicate." Father healthy. A first child.

General surroundings. Good. No known contact with infectious disease. No known prevalence of infectious disease.

Sanitary conditions. Good, so far as house and surroundings are concerned, but bad smell from gullies and manholes complained of in the town.

Summary of reporter's conclusion. Reporter confesses himself "at a loss to account for "the fatal illness of B. D., and questions as to the possi-"bility of the infection having arisen from the tooth "stump extracted on the morning of the vaccination." Vaccinator "regards the death as due to the toxic "effect of the products absorbed into the system from "the morbid process going on in the vaccinated arm, "but he had no theory as to the causation of that "morbid process."

Note.—It is possible that one of the tubes was not sealed.

[T. D. A.]

CASE CXXXI., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR. $\frac{Ac}{2}(3)$.

(*Report dated* 21*st November* 1890.)

Case of. H. S., male, aged 5 months.

Vaccination. October 13th, 1890, by Mr. A. S., privately. Two insertions.

Death. November 6th, 1890.

Certified cause. "Vaccination; erysipelas."

Certified by. Mr. A. S.

Source of lymph. Humanized lymph direct from arm of child.

Vaccinifer. No record.

Co-vaccinees. One child, S. C. No excess of inflammation. Scabs injured, and healing somewhat delayed.

Sub-vaccinees. None. Vesicles not opened.

Course of vaccination and illness. Normal on 8th day. Towards end of 2nd week mother states some "fresh blisters" formed round vaccination vesicles. (The latter not at this time broken). At beginning of 3rd week inflammation appeared round vesicles, this shortly extended from shoulder to elbow. On 18th day mother noticed a lump in axilla. Fore arm and hand were swollen. Subsequently redness and swelling extended to trunk and legs. Deep ulcers under vaccination scabs.

Treatment of vesicles. After vaccination Mrs. S. tried to rub the matter from one of the places with a clean handkerchief wetted from her mouth. On 9th day cream applied to vesicles with finger by mother. No shield used. Arm not rubbed.

Method of vaccination. A small tenotomy knife used, kept exclusively for the purpose. This was clean and in good order when inspected.

Previous history. Not stated.

Family history. Husband had died of pneumonia, one child of diarrhœa, one of measles during previous 18 months.

General surroundings. House fairly clean and wholesome. Child not known to have been exposed to infection. No illness in house. Three cases of typhoid fever were reported in neighbourhood between September 29th and November 6th.

Summary of reporter's conclusion. Reporter arrived at no conclusion as to the cause of the erysipelas, but considers that the "mother's injudicious treatment of the arm," the "unwholesome conditions in the neighbourhood as indicated by the presence of typhoid fever," and "the fact of three other deaths having occurred in the house" during 18 months, are suspicious facts. He notes that the inquiry could not be fully carried out, owing to their being no record of the source of lymph.

[T. D. A.]

$\frac{Ab}{2}$(1). CASE CXXXII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated 10th November* 1890.)

Case of. E. B., female, aged ?

Vaccination. April 5th, 1890, according to register, April 9th, according to mother, by Dr. A., Medical Officer to Infirmary.

Death. April 25th, 1890.

Certified cause. "Cellulitis and sloughing following vaccination wound, 2½ weeks."

Certified by. Mr. B. of S. Hospital.

Source of lymph. From child P., vaccinated March 30th (?)

Vaccinifer. Vaccination stated to have "showed no bad symptom" but a few spots on inside of vaccinated arm were noticed. This child died May 21st. Certified cause of death, "Tabes mesenterica; convulsions."

Co-vaccinees. Four. One vaccinated on April 5th, one on April 10th, and two on April 15th.
In two vaccination normal.
In one cellular inflammation.
One could not be found.

Sub-vaccinees. None. Vesicle not opened "because the child's eyes were bad."

Course of vaccination and illness. "Places rose nicely" about 4th day.
8th day wounds somewhat inflamed.
Child then removed from Infirmary. Arm became more inflamed. Subsequently "the vaccination heads dried up." Deep sores were left "to the bone." When child was seen by Dr. B. the day before death the wounds were found to have sloughed, there were signs of recent cellulitis of the unvaccinated arm. Child died of exhaustion. After death the sores appeared large and excavated with "dark brown crusts sunk below the level of the surrounding skin."

Treatment of vesicl. Not stated.

Method vaccination. Not stated.

Previous history. Child stated to have been well when born, but "its eyes were bad," and they continued bad during vaccination.

Family history. Mother unmarried, unhealthy looking. Father said to be healthy.

General surroundings. Bad. Mother, grandmother, and child lived in a "small squalid room."

Summary of reporter's conclusion. Reporter concludes that the child's death was probably "mainly due to inherited constitutional disease" . . . "accelerated by the exhaustion caused by the cellulitis," but "whether the cellulitis was due to accidental irritation, or the action of vaccinia in an unhealthy body" he is unable to decide.

[T. D. A.]

CASE CXXXIII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.* **$\frac{Aa}{0}$(2.).**

(*Report dated 2nd December* 1890.)

Case of G. M., male; aged five months.

Vaccination. October 14th, 1890, by Mr. B., Public Vaccinator.

Death. November 16th, 1890.

Verdict coroner's jury. "Convulsions brought on by vaccination."

Source of lymph. From child, W. E. J.

Vaccinifer. Fine healthy child. Four "perfectly typical scars."

Co-vaccinees. Twelve. In nine vaccination stated to have been normal. In two, wounds had healed slowly. One could not be traced.

Sub-vaccinees. By inference none, but vesicles were opened.

Course of vaccination and illness. Reported by a neighbour to have been favourable during first week. A few days after inspection arm became inflamed, "a gathering" formed in the axilla; this broke and discharged. "The arm did not heal properly." Subsequently the child had "a convulsive attack," and died November 16th. Child was stated to be teething.

Treatment of vesicles. Bread poultices applied during 2nd week.

Method of vaccination. Vaccinator stated to be careful and experienced and "scrupulous in the selection of vaccinifers." Opens vesicles with lance of Birmingham pattern, collects lymph in capillary tubes, using a fresh tube for each vaccination, and subsequently destroying it. Vaccinating instrument a scarifier with three teeth "made to his own order," this is of a make difficult to keep clean, but vaccinator uses every precaution in cleansing and disinfecting it. Reporter believes vaccinator "succeeds in keeping clean that part of the instrument which touches the arm."

Previous history. Not stated.

Family history. Not stated.

General surroundings. Not stated, only mother had to go out to work, child was artificially fed.

Sanitary condition. Not stated.

Summary of reporter's conclusion. Reporter concludes the attack of convulsions "was in all probability due" to the "irritation of teething," and to the child being "artificially fed." He considers that the child "must have been weakened by the abscess in the axilla," and adds that "this was probably the effect of the entry of some irritant matter at the vaccine sores either from the poultice or from dirty handling."

[T. D. A.]

CASE CXXXIV., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.† **$\frac{AA}{2}$(2).**

(*Report dated 17th November* 1890.)

Case of E. L., aged three months.

Vaccination. October 8th, 1890, by Dr. B., private practitioner, in one place.

* *This case is also amongst those brought to the notice of the Commission with a view to their investigation; being the same as that numbered as Case 33 on page 247. The case was not, however investigated by a medical man on behalf of the Commission.*

† *This case is also amongst those brought to the notice of the Commission with a view to their investigation; being the same as that numbered as Case 77 on page 262. The case was not, however, investigated by a medical man on behalf of the Commission.*

November 1st, 1890.

"Erysipelas, two weeks; exhaustion," stated also to have "been vaccinated three weeks ago."

Mr. J. E.

Dr. B.'s is a ready money practice, no record is kept, but lymph is stated to have been calf lymph from Dr. R. received through Messrs. R. and B. without record of source.

Not stated.

None.

Stated to be normal on 8th day, October 13th. On October 27th child seemed poorly. On October 18th mother observed redness round pocks extending to wrist and shoulders. This gradually extended, involving more or less the whole trunk and extremities. Before death numerous "minute vesicles appeared "upon the red blush in several parts." Vesicle, which appears to have been small, is said by Dr. B. to have covered before death with "a perfectly normal crust."

Lotion and ointment prescribed by Mr. E.

Cooper Rose instrument used.

Stated to have "ailed nothing before vaccination."

Not stated.

A case of erysipelas had occurred next door; stated to have been convalescent on October 3rd. Mrs. L. was an intimate acquaintance of this woman. She is, however, stated not to have visited Mrs. L. until called in on the 17th, when child was ill. Mother, however, owns to having "run in occasionally" and during these visits to have "left her baby in the downstairs "room." The child had also "been directly exposed to the infection of whooping cough."

Fairly good, except that "sink pipe appears to com- "municate directly with the drain" and "has no bell "trap fitted to it."

Reporter gives no summary, but considers that "the "erysipelatous infections" of E. L.'s arm "was possibly "brought about" indirectly by the case of erysipelas, next door, and draws attention to the fact of the child being directly exposed to the infection of whooping cough.

[T. D. A.]

CASE CXXXV., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE REGISTRAR-GENERAL.

(*Report dated 30th November* 1890.)

O., female, aged three months.

In 9th week. October 4th, 1890. Private.

October 27th, 1890.

"Erysipelas following vaccination."

Twelve capillary tubes were filled on 8th day from vesicles on arm of child S. Seven of these were used 18 days afterwards.

Healthy. Family history good.

Six. Of these five were successful and normal; one failed on first vaccination, but was successful on repeating the operation.

None.

On inspection, October 11th, the vesicles appeared normal. On October 16th, the child had extensive erythema of vaccinated arm. Erysipelas subsequently developed and spread all over the body.

Note.—A new shield was used, but the vesicles were not broken or rubbed. Lead lotion was applied under doctor's directions.

"The first sign of illness in the child was soreness "and inflammation round the anus, which appeared "on October 12th. The arm did not begin to inflame "until October 14th, when the inflammation at the "anus had subsided." Diarrhœa commenced about October 16th.

Good.

By inference good; nothing stated to the contrary.

Healthy. *Surroundings.*

The child died of erysipelas spreading from the vaccination vesicles during the development of the areola. The reporter "suspects that the erysipelas "began with the anal inflammation, and was only "coincidently connected with the vaccination"; on the ground that "the arm was not inflamed until the "inflammation at the anus had subsided." *Summary reporter's conclusion.*

[T. D. A.]

CASE CXXXVI., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.* $\frac{Ac}{2}(2)$.

(*Report dated 17th November* 1890.)†

H. J. E., male, aged nine weeks. *Case of.*

October 7th, 1890, by Dr. T., Public Vaccinator. *Vaccination.*

October 28th, 1890. *Death.*

"Erysipelas after vaccination, 10 or 12 days." *Certified cause.*

Reporter concludes that "the fatal complication was "related to one or other of the cases of sore throat in "the district (perhaps the sore throat of the deceased's "sister) or perhaps to the whooping cough next door." *Summary of reporter's conclusion.*

[T. D. A.]

CASE CXXXVII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR. $\frac{Ac}{0}(3)$.

(*Report dated 12th November* 1890.)

E. B., female, aged about 11 weeks at the time of vaccination. *Case of.*

August 6th, 1890, by Mr. R. S. J., qualified deputy for Public Vaccinator, in four places. *Vaccination.*

September 10th, 1890. *Death.*

"Erysipelas 20 days (post vaccination 16 days)." *Certified cause.*

Dr. B. *Certified by.*

From child B. L. *Source of lymph.*

Stated to be fine healthy child. Vaccination normal. *Vaccinifer.*

Five. Vaccination normal in all. *Co-vaccinees.*

None. *Sub-vaccinees.*

On 8th day four good vesicles; no excess of inflammation; arm healed quickly; wounds were scabbed over by August 18th. *Course of vaccination and illness.*

August 19th, child appeared poorly. August 21st, some redness noticed round points of vaccination. August 22nd, scabs fell off, but there was no discharge. Redness continued to spread, and finally involved the whole body, and child died from exhaustion.

Cold cream applied when scabs fell off. No shield used. Sleeve of child's dress tied up. *Treatment of vesicles.*

Vaccinator had left district, no details could be obtained. *Method of vaccination.*

Stated to have been a strong healthy child. *Previous history.*

Parents young and apparently healthy. *Family history.*

Mother worked in a mill, leaving child each day in care of its grandmother. She suckled child two or three times a day. Both houses scrupulously clean when inspected. It could not be ascertained that any child attending vaccination station on August 6th or 13th had suffered from infectious disease. No known prevalence of infectious disease in the neighbourhood at the time. *General surroundings.*

In mother's house no through ventilation. Slop sink "in the middle of the house with an imperfectly "disconnected wash pipe." Grandmother's house satisfactory. *Sanitary conditions.*

Reporter does not think from the evidence "that "vaccination *qua* vaccination can be said to have been "the cause of the erysipelas," but considers it probable that "the vaccination wound allowed of the introduc- "tion of septic material," but how or when he is "not prepared to state." *Summary of reporter's conclusion.*

[T. D. A.]

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* *This case is also amongst those brought to the notice of the Commission with a view to their investigation; being the same as that numbered as Case 32 on page 245.*

† *As the Commission have made inquiry into the circumstances of this case, it has not been thought necessary to give here a detailed analysis of this report.*

O1. CASE CXXXVIII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY ONE OF THE BOARD'S INSPECTORS.

(*Report dated 16th December* 1890.)

Case of. G. B. B., male, aged three years.

Vaccination. October 12th, 1886, by Mr. P., Public Vaccinator.

Death. December 31st, 1889.

Certified cause. "Acute tubercular pnuemonia, three weeks."

Certified by. Mr. M.

Source of lymph. Stated in register to have been "calf lymph," but no record whence obtained.

Co-vaccinees. According to register three children were vaccinated on October 12th, 1886, with "calf lymph." There appears, however, some doubt as to the accuracy of the register in one of these cases.

In all vaccination was normal.

Sub-vaccinees. Not stated; by inference none.

Course of vaccination. Mother states arm began to inflame two or three days after vaccination, that by 8th day inflammation extended to wrist, and "that child was covered with "pimples from head to foot." She also observed a swelling in axilla, which she states did not burst, but never entirely disappeared. Wounds are stated to have "kept skinning over and breaking out again," and not to have healed completely for six months.

Note.—Child is stated to have been attended for nearly five months by Dr. R., but he only saw the child three times.

Course of illness. The rash referred to is said never entirely to have disappeared, and swellings are stated to have formed "behind the ears, on the chin, and in the groin." Two or three weeks before death, it became ill with a bad cough, was very emaciated and had continual perspiration until it died. Dr. M. states, "child suffered from "chronic eczema, but was otherwise well until attacked "by the acute pneumonia, of which it died."

Treatment of vesicles. No coloured clothing worn, but a shield was used. When arm became inflamed mother applied cream with her finger.

Method of vaccination. No details given. Vaccinator had retired.

Previous history. Not stated.

Family history. At time of this child's death the baby (unvaccinated) also suffered from pneumonia.

Mother's family history good. Father lost "several" brothers and sisters during infancy; he says "they went "off quickly and they coughed."

Mother states no "tendency to skin rashes in the "family."

General surroundings, &c. Not stated.

Summary of reporter's conclusion. Reporter concludes child suffered from "a bad arm "after vaccination"; and was shortly after attacked with eczema, but whether the result of vaccination he is unable to decide. Its death "was clearly due to lung "mischief."

Four years having elapsed since this vaccination was performed reporter did not consider that "the inquiry "could be usefully carried further."

[T. D. A.]

Ac 2 (2). CASE CXXXIX., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated 20th December* 1890.)

Case of. C. D., female, aged three months.

Vaccination. Date not exactly known. Stated by mother to have been "17 days before death." Dr. H., the vaccinator, a private practitioner, had no record.

Death. December 5th, 1890.

Certified cause. "Vaccinia; erysipelas; exhaustion."

Certified by. Mr. F. G., assistant house surgeon, —— Infirmary.

Source of lymph. Stated to have been "humanised lymph in a tube," but no record kept.

Co-vaccinees. Vaccinator had no record, but stated that he vaccinated one child, G. T., at same time as C. D., of two insertions one only took. Some slight inflammation occurred during second week, but arm healed duly leaving normal cicatrix.

Sub-vaccinees. By inference none.

Course of vaccination. On 8th day vesicles (number uncertain) were broken, and appeared to have been rubbed. Mother states they were not then inflamed, vaccinator says "there was "about an inch of areola around them." On evening of 11th day mother noticed swelling and "redness" in left axilla, the redness spreading to shoulder of same side. On December 1st child was seen by Dr. S., who found her suffering from large unbroken axillary abscess, but he affirms there was then "no appearance "of erysipelas either about the vaccination scars or in "the axilla." December 2nd, child was admitted to —— Infirmary. At this date abscess had burst, and the aperture looked "ragged and unhealthy;" there was also "a well-marked erysipelatous rash" over left side of chest, left shoulder, and arm to elbow. Vaccination wound, so far as could be remembered, "not "deep, and discharged but little," discharge being thin and serous. Erysipelas finally extended over trunk; uncertain whether erysipelas began around abscess or vaccination places.

Note.—Dr. S., who saw the child before admission to infirmary, states, he considered "that the abscess was "caused by syphilis, or was scrofulous."

Treatment of vesicles. No shield used; sleeve of child's pink twill frock lined with thin white muslin. Mother applied "milk "from her breast" to the vesicles, allowing it to drop "on the arm, she did not apply it with her fingers."

Method of vaccination. No record of lymph source kept. Ungrooved vaccination lancet used stated to be kept "exclusively for "vaccination." Clean and in good order when inspected.

Previous history. Not stated.

Family history. Father stated to be suffering for hereditary "syphi-"litic cirrhosis of liver"; the only other child is scrofulous.

General surroundings. Home "very dirty, offensive, and comfortless." Child not known to have been exposed to infectious disease. Stated to have "illness next door," but its nature could not be ascertained; the families were not friendly, and there appears to have been no intercourse between them. No prevalence of infectious disease.

Sanitary condition. Cottage old. No special sanitary defect noted, but a pail in scullery, used as a "convenience" for the other child, "contained an accumulation of fœcal matter, and "apparently had not been emptied for some days."

Summary of reporter's conclusion. Reporter considers the late appearance of the erysipelas and the well doing of the vaccination in the case of the child G. T. "are facts strongly opposed to "the idea of septic matter having been imparted" by vaccination. He points out that the bad conditions of the child's surroundings would afford "ample opportu-"nities . . . for contamination of the wounds by pol-"luted air and filth," and thinks "it may be confidently "concluded that the erysipelas was not a result of "vaccination as such but of some adventitious some-"thing superadded thereto in the case of a child of "bad constitution."

Note.—Source of lymph not known. It is open to question whether G. T. was co-vaccinee.

[T. D. A.]

O2. CASE CXL., REPORTED TO THE LOCAL GOVERNMENT BOARD BY ONE OF THE BOARD'S INSPECTORS.

(*Report dated 18th December* 1890.)

Case of. W. F., male, aged three months.

Vaccination. May 2nd, 1889, by Mr. T., Public Vaccinator.

Death. May 4th, 1889.

Certified cause. "Purpura hæmorrhagia."

Source of lymph. Direct from arm of child J. S.

Vaccinator. Healthy. Vaccination normal.

Co-vaccinees. Not stated.

Course and illness. Mother stated child was ailing on May 1st. This was not mentioned to Mr. T. at time of vaccination. Day after vaccination child dull and poorly. At 4 a.m. May 4th, third day, Mr. T. sent for, child stated to be dying.

Child had purpuric spots on legs, lower part of trunk and some on arms and face; very pallid, lips pale, pupils dilated, bleeding from mouth. Low temperature, rapid feeble pulse. Child died 4.30. Vaccination places slightly inflamed, no "hæmorrhagic infiltrations and no "pus."

Ordinary lancet used, found to be clean and in good order. Board instructions carefully observed.

Not stated.

Not stated.

Not stated. Measles said to be "about" at the time.

Reporter concludes that "there is no evidence in this "case to connect death with vaccination," and agrees with Mr. T. that the child's illness and death were altogether "independent of vaccination." Mr. T. believes it to be due to "internal hæmorrhage," possibly reporter thinks an "irregular case of measles."

[T. D. A.]

CASE CXLI., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated 16th January* 1890.)

G. A., male, aged one month and five days.

September 3rd, 1890, by Dr. C., Medical Officer to H—— Workhouse Infirmary when twenty days old.

September 19th, 1890.

"Vaccination, 16 days; erysipelas 14 days."

From arm of child T., taken January 17th, 1890; how preserved not stated.

No details given.

Child R. died of erysipelas (see Case CXLII.) "Several" children stated to have been vaccinated direct from arm of child T. No details given, but Dr. C. says none had "shown any bad effects."

By inference, none.

No details given, except "A." had erysipelas in the vaccinated arm on September 5th.

Not stated.

Not stated.

The bedding on which the mother was confined had been for a week in a ward in which there had lately been a case of erysipelas, but the ward had previously been "fumigated with sulphur." It is stated that some cases of erysipelas had occurred in the district.

Reporter concludes that it is difficult from the evidence to give any "precise explanation of the erysipelas," but thinks it probable that it was derived from the case of erysipelas which had previously occurred in the Workhouse.

[T. D. A.]

CASE CXLII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated 16th January* 1891.)

F. R., male, aged one month and two days.

September 3rd, 1890, by Dr. C., Medical Officer to H—— Workhouse Infirmary when sixteen days old.

September 20th, 1890.

"Vaccination 17 days; erysipelas 12 days."

From arm of child T., taken January 1st, 1890; how preserved not stated.

No details given.

One. Child A. died of erysipelas (see Case CXLI.). "Several" children stated to have been vaccinated direct from arm of child T. No details given, but Dr. C. says none had "shown any bad effects."

By inference, none.

No details given, except "R. had erysipelas in the "vaccinated arm on September 8th."

Not stated. *Treatment of vesicles.*

Not stated. *Method of vaccination.*

The bedding on which the mother was confined had been for a week in a ward in which there had lately been a case of erysipelas, but the ward had previously been "fumigated with sulphur." It is stated that some cases of erysipelas had occurred in the district, but no cases were reported at the time. *General surroundings.*

Reporter concludes that it is difficult from the evidence to give any precise explanation of the erysipelas, but thinks it probable that it was derived from the case of erysipelas which had previously occurred in the Workhouse. *Summary of reporter's conclusion.*

[T. D. A.]

CASE CXLIII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR. **O4.**

(*Report dated 29th December* 1890.)

J. B. A., male, aged four months. *Case of.*

"Towards the end of February" 1890, according to mother's statement, privately, by Mr. H., partner of Dr. W., Public Vaccinator, in two places. *Vaccination.*

March 25th, 1890. *Death.*

"Pyæmia; erysipelas." *Certified cause.*

Mr. H., vaccinator. *Certified by.*

No record kept, but stated to be "from a clean tube "recently filled—from a child's arm at the public "station." *Source of lymph*

Not stated. *Co-vaccinees.*

By inference none. *Sub-vaccinees.*

Mr. H. states the vesicles were normal on 8th day. Mother, however, states that the arm was not inspected, and that certificate of successful vaccination was given at time of vaccination. (It bears date February 21st, 1880.) During first week in March a nævus of the nature of a "port wine stain" on right leg "cracked" and "watery discharge came from it," subsequently the wound inflamed. On March 8th child again seen by Dr. H. He states the appearance of the arm at this time was normal and continued uninflamed throughout. Mother states "the arm did not heal" and that "there "was a dark purplish appearance around the unhealed "pustules." The right leg is stated to have been at this time "angry, red, and swollen," subsequently "erysipelatous blush" appeared round nævus, limb became much swollen, pus formed in right knee joint according to Dr. H., in the left according to the mother, who also states that the glands in both groins became hard and swollen and that the "redness" extended "up "to the chest." "Convulsions, sweatings, and other "signs of pyæmia" followed. The child died in convulsions. *Course of vaccination and illness.*

The evidence is conflicting. Mother states Dr. H.'s assistant ordered the arm to be poulticed. Dr. H. denies that any treatment was ordered by himself or his assistant, and states that the arm "required no "medical attention or treatment." A shield was used, and fuller's earth applied by mother. *Treatment of vesicles.*

A Cooper Rose instrument used, clean and well kept when inspected. Surgery where vaccination was performed clean, airy, and well ventilated. Dr. H. keeps no record of his private vaccinations. *Method of vaccination.*

Child stated by Dr. H. to be strumous. Mother states child had a rash on buttocks when born, but was otherwise healthy. It had nævi one on neck, and one on right leg. *Previous history.*

Not stated, except that mother married late. This was her first child. *Family history.*

House airy and well-ventilated. Child was hand-fed. Husband's mother six months before child's birth had suffered with "dropsy and erysipelas" in same house, but room had been "fumigated and cleaned." *General surroundings.*

During February and March 26 cases of scarlet fever, two of diphtheria and two of erysipelas, besides that of deceased, were noticed in district. Child had had no known communication with any of them.

Satisfactory. *Sanitary condition.*

Reporter considers that owing to the absence of any evidence as to the lymph source, and the "diametrically *Summary of reporter's conclusion.*

" opposed statements of Mrs. A. and Dr. H. concerning " the state of the arm during the child's illness " there is no certain proof that the vaccinator was free of blame, but from the fact that the child's illness did not begin until the first week in March he thinks that " on " the whole there is indication that the fatal trouble . . " was something superadded to the vaccination pro- " cess," but how the erysipelas originated the " scanty " and conflicting evidence " will not allow him to say.

[T. D. A.]

$\frac{AA_C}{0}$ (2.V) CASE CXLIV., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated 19th January* 1891.)

Case of. C. E. B., female, aged six months.

Vaccination. June 10th, 1890. By private practitioner (Mr. K.) at his dispensary. Two insertions.

Death. June 30th, 1890.

Certified cause. " Gangrene of arm after vaccination; convulsions."

Source of lymph. Calf lymph (Renner).

Co-vaccinees. None.

Sub-vaccinees. None.

Course of vaccination. Normal till 8th day (June 17th) when inspected by the vaccinator, who opened both vesicles with lancet, and charged ivory points. (None of this lymph has been used.) On evening of 18th child was very feverish, and on 19th there was much inflammation on left arm around vaccine vesicles.

Course of illness. Mother obtained medicine for the child on 21st and 23rd, but it did not improve; and a swelling formed in the axilla. On 26th it was taken to Mr. K., who describes the arm as being then in a state of " gangrene," which the reporter thinks must mean phlegmonous erysipelas. The mother says there was a red blush on the left side of body, and down left leg, which afterwards changed to a dark purple mottling. The axillary swelling was poulticed but did not discharge, and the child died exhausted on June 30th.

Family history. Parents healthy. C. E. B. was the 8th child; the first three living, healthy: the next four are dead—two from bronchitis, one from convulsions while teething, and one still born. No trouble with the vaccination of any of earlier children. The present subject was fed at the breast, and was quite well up to date of vaccination.

General surroundings. No case of scarlet fever or erysipelas in neighbourhood. There had been measles in the district, but not near the house; and the child itself had no sign of measles. No offensive business in street, and nothing about dwelling to suggest source of septic infection.

Summary of reporter's conclusion. Course of vaccine disease quite favourable up to 8th day, but erysipelas set in on 10th. The opening of the vesicles on the 8th day probably gave entrance to the contagion of erysipelas, but no definite information available as to source of latter. It is possible that it may have been present at the dispensary when the vaccination and the opening of vesicles took place.

[S. C.]

$\frac{Ac}{2}$ (2). CASE CXLV., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated 19th January* 1891.)

Case of. H. C. H., male, aged four months.

Vaccination. November 3rd, 1890, by Dr. R., Public Vaccinator, in four places.

Death. November 30th, 1890.

Certified cause. " Erysipelas following vaccination, 12 days."

Certified by. Mr. H.

Source of lymph. Direct from arm of child C.

Vaccinifer. " Fine healthy child, with four typical scars."

Co-vaccinees. Five, vaccination normal in all, in one scabs were rubbed and healing somewhat delayed.

Sub-vaccinees. Not stated.

Course of vaccination and illness. Two days after vaccination child, who was suffering from phimosis, was circumcised.

On 8th day " arm showed three good vesicles without " undue areola."

During 2nd week arm became more inflamed, child seemed ill. Later inflammation spread from shoulder to hand, neck, and chest. Circumcision wound did not heal, but the erysipelas does not appear to have spread to it, although it would appear that there was considerable irritation of the parts.

Child sank 27 days after vaccination with what Dr. H. considered " symptoms of meningitis."

Vesicles were poulticed by doctor's orders.

Not stated.

During the week previous to its examination, the child had suffered from diarrhœa, for which it was treated at Children's Hospital.

Not stated.

" Dirty and unwholesome."

Reporter concludes that although " there is no posi- " tive evidence as to the source of the erysipelatous in- " fection there is certainly no reason for attributing it " to vaccination." He considers it " most likely to have " gained entrance by the surgical wound," but in that case thinks those parts would have been first affected, which they appear not to have been. The reporter further concludes that " it is much to be regretted that " the serious operation of circumcision should have " been performed upon a child during the course of its " vaccination.

[T. D. A.]

CASE CXLVI., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated 19th January* 1891.)

J. W., male, aged one month.

November 10th, 1890, by Mr. B., Assistant Medical Officer to L. Infirmary, when two days old.

December 9th, 1890.

" Vaccination; severe suppuration of the arm; septi- " cæmia."

Mr. D.

One of four tubes of W.'s calf lymph received that same day.

Three, all normal when inspected on 8th day, and believed to be so when discharged from Infirmary.

Not stated.

Normal when inspected on 8th day. Wounds stated to have been " scabbed over " when child discharged from Infirmary, November 24th. On this day the scabs appeared to have injured and the nightgown stuck to the vesicles. On November 26th child was found to be suffering from " circumscribed cellulitis of vaccinated " arm; " the vesicles coalesced and an abscess formed and broke near vaccination places. Three days later abscess ceased to discharge; the wound, about the size of a florin " presented a healing surface " and finally became covered with a " thin dry scab." It is stated that there was no discharge, swelling, or redness at the time of the child's death. On December 8th child is described as suffering from " profuse diarrhœa," to have " a very bad cold," and a " nasty croupy cough." It died the next day.

Three insertions made, a bright needle sent with the lymph used; cleansed between each vaccination. One tube of lymph used for each child.

Not stated.

No statement as to condition of child at birth.

Mother unmarried woman.

No cases of septic nature in the infirmary. Mother was " idle, careless, and dirty in her habits," and from the first appears to have neglected her child. Child's clothing scanty and dirty. The day after leaving the Infirmary mother and child were sent by train from home at B——n to convalescent home at B——m. Bitterly cold day, child poorly clad. Next day, November 26th, the arm looking " red and angry," child was

sent back to B——n for treatment. About December 6th, mother went to service at a distance. Child was subsequently weaned. On December 8th child was boarded out with a married couple, the house being "small and dirty, and ill-ventilated." Child appears to have been unable "to suck his bottle."

Reporter concludes the immediate cause of child's death appears to have been diarrhœa, for which and for its other ailments it received no medical treatment, and further adds that these "do not seem to have had any "connexion with the vaccination."

Dr. D. who attended the child states "he does not "blame vaccination for the death of the child; any "wound, he says, subjected to the same adverse con- "ditions would have developed similar complications." He considers the disaster to be mainly the result of the mother's careless and dirty ways.

[T. D. A.]

CASE CXLVII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated 19th January* 1891.)

F. B. T., female, aged 11 months.

August 14th, 1889. When seven or eight weeks old. By Dr. C. in five places.

May 21st, 1890.

"Syphilis (congenital) or through vaccination or "exhaustion."

Mr. P. M. McD., L.R.C.S.

From calf No. 1928, preserved in tubes; by inference since June 13th, 1889.

Six. Three could not be traced. In two, vaccination stated to have been normal, but one had since died (July 1890) of bronchitis, &c.

Twenty-four children vaccinated direct from same calf on June 13th, 1889. No details as to course of vaccination.

None. Vesicles not opened.

Only four very small vesicles formed. There was no complication of any kind; the places scabbed over, and the arm healed normally. The mother noticed nothing unusual in the condition of the child except that it slept heavily the day after vaccination.

In December 1889, four months after vaccination, the child suffered from a sore mouth, and subsequently from a sore cheek, due apparently to infection from the saliva, and "giving rise to general eczema of the head "and face." The mother's breast became inoculated, and she had to discontinue suckling the child, who was subsequently fed on Ridge's food and "a little of what- "ever food the parents had." On this unsuitable food it did not thrive, and after two or three months "diar- "rhœa set in, and thrush," and the child died exhausted. It was treated at —— hospital.

Mother suffered from sores on hand, arm, and breast, inoculated from the child's head.

Two other children; both inspected; one showed signs of rickets, and was delicate, but neither gave evidence of syphilis.

Father not seen, but believed not to be syphilitic.

Not stated.

Not stated.

Reporter concludes that "it does not appear that "there was any ground whatever for attributing the "child's illness to vaccination or to syphilis."

Dr. C. infers that as F. B. T. was treated as a "casualty" and not as an "out-patient" at —— hospital, she did not require "continued constitutional "treatment," and concludes from this that the "case "was not considered syphilitic."

[T. D. A.]

CASE CXLVIII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated 19th January* 1891.)

E. E. R., male, age eight months.

September 24th, 1890, by Dr. C., Public Vaccinator.

November 23rd, 1890.

Death.

"Strumous ulceration after vaccination; bronchitis "10 days."

Certified cause

Fresh calf lymph.

Source lymph.

Sixteen. Four could not be traced. In 12 vaccination found to have been normal.

Co-vaccinees.

None. Vesicles not opened.

Sub-vaccinees.

Normal on 8th day. "A few days after" the vesicles broke and discharged, they subsequently coalesced, and did not heal, and an indolent ulcer formed. About a month after vaccination child was seen by Dr. C. B. Later it suffered from bronchitis. The arm never healed.

Course of vaccination and illness.

Note.—The ulcer was a deep one with ragged edges and large flabby granulations, no heaped up hard edge, or punched out appearance. It is further described as "a flabby indolent ulcer;" there was no suspicion of syphilis.

Satisfactory.

Method of vaccination.

No application made except under medical advice.

Treatment of vesicles.

Father healthy. Mother delicate. She states that at the time of the child's vaccination she was suffering with "cracked nipples and erysipelas" on both sides, but continued to nurse the child for some weeks. Two living children. One had suffered from abscess of the scalp. One child died from "abscess under the "chin."

Family history.

Dirty, but reasonably healthy.

General surroundings.

The reporter considers "that it is tolerably clear that "vaccination can be eliminated as having had direct "share" in causing the child's death. He is of opinion that "struma was undoubtedly the chief agent "in inducing the fatal malady," but "how the ulcera- "tion was set up" he finds it "hard to say."

Summary of reporter's conclusion.

Note.—Ulceration started from the vaccination vesicles during the second week.

[T. D. A.]

CASE CXLIX., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

$\frac{Ac}{2}(3)$.

(*Report dated 7th January* 1891.)

R. R., female, aged four months.

Case of.

October 6th, 1890, by Dr. W., Public Vaccinator.

Vaccination.

December 5th, 1890.

Death.

"Vaccinia two months; erysipelas six days."

Certified cause.

Mr. G.

Certified by.

From child D. R. Vaccinated September 29th with calf lymph from N. V. E.

Source of lymph.

Stated to be healthy.

Vaccinifer.

Ten.
In seven, vaccination stated to have been normal.
In one, "unsuccessful."
Two could not be found.

Co-vaccinees.

Eleven.
In eight vaccination stated to have been normal; one suffered from a "slight rash" a fortnight after vaccination.
One three weeks after vaccination from an axillary abscess. This child is stated to have been strumous. One child could not be found.

Sub-vaccinees.

Vaccination normal on 8th day.
About the end of October mother noticed redness around the vesicles. This gradually extended to elbow, shoulder, left side, neck, chest and back.

Course of vaccination and illness.

Arm poulticed, subsequently by mother to assist "the falling off of the crusts" pig's lard and castor oil applied to the vesicles with her fingers; this was before the "redness appeared;" application of castor oil was continued afterwards. Later arm was "painted" by order of the doctor.

Treatment of vesicles.

An ordinary lancet and scarifier used, found to be clean and well kept. Vaccination performed in "clean

Method of vaccination.

"airy" room of cottage. Dr. N. stated to have received Local Government Board on "many occasions."

Previous history. Not stated.

Family history. Not stated.

General surroundings. Mother stated to "unintelligent and dirty." Father mother and five children occupying dirty damp unwholesome rooms in dilapidated cottage in which altogether 23 people reside. No known infectious disease in house or neighbourhood.

Sanitary condition. No special defect of water or drainage noted, but condition of house itself insanitary.

Summary of reporter's conclusion. Reporter considers from the late appearance of the erysipelas and from the well doing of the co-and-sub-vaccinees (with the exception of the "trifling ailments" in two cases) that it is a "a warrantable conclusion "that vaccination was but remotely and indirectly re-"sponsible for R.'s death;" he thinks it is "impossible "to deny" that the child's unwholesome surroundings must have had a general effect in determining the fatal result which he is disposed to attribute primarily "to "the ignorant tampering with the arm practised by the "mother and to the mistaken application of pig's lard and "castor oil" with dirty fingers. The reporter notes the fact that one of the co-vaccinees who did well lived in the same house and was therefore exposed to the same bad conditions.

[T. D. A.]

AAc/3 (1). CASE CL., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated 20th December* 1890.)

Case of. C. H. M., male, aged three months.

Vaccination. October 28th, 1890, by private practitioner (Dr. F.). Three insertions with lancet kept for purpose, and cleansed before and after.

Death. November 25th, 1890.

Certified cause. Erysipelas following vaccination.

Source of lymph. Calf lymph (Renner) from one of two tubes obtained on October 21st.

Co-vaccinees. None from same tube as this child—but two others vaccinated on October 23rd from another tube obtained at same time. Both did well. Inquiry at Dr. Renner's establishment showed that both tubes were taken from the same calf which furnished sufficient lymph to furnish supplies of 1, 2 or 3 tubes to 344 applicants. No other instances known to Dr. Renner of alleged ill-effects from this lymph.

Sub-vaccinees None.

Course of vaccination. The mother stated that the infant's arm began to look red on November 2nd, the 6th day, when one of the vesicles had the top accidentally rubbed off, the child wearing at the time a short sleeved new frock of pink "flannelette," the sleeves being trimmed with a rather hard crochet frill. But the mother thought the redness of arm commenced before this injury occurred. On the 8th day the doctor found the arm somewhat inflamed, a patch of redness surrounding the three vesicles, and extending for about an inch beyond them. The doctor took two tubes of lymph for microscopical examination (not for use) and thought he detected some minute round cocci in the one he examined.

Course of illness. The redness continued to spread as cutaneous erysipelas extending to the tips of fingers, the hand being greatly swollen. The erysipelas—which was superficial, and distinct from blebs or suppuration—spread over the whole trunk, and partly over the head and face, as well as to the opposite arm and both legs. Death took place from exhaustion November 25th, the 29th day.

Family history. The family are reported healthy, but the mother is subject to sore throat, and as she was suffering from a sore throat the child's vaccination was postponed five or six days. There was at the time no other case of illness in the house.

General surroundings. Diphtheria was prevailing in another part of the district about two miles away, and no cases were known in the vicinity of the house; nor so far as could be learnt was there any erysipelas in the neighbourhood. The doctor did attend a case of erysipelas about a mile distant at a date between the vaccination and his inspection of the child on the 8th day.

The house was one of a row, was regarded as fairly clean, and the drains were examined and found free from defect.

The reporter is unable to assign a cause for the erysipelas. *Summary of reporter's conclusion.*

[S. C.]

CASE CLI., REPORTED TO THE LOCAL GOVERNMENT BOARD BY FATHER OF CHILD. **Ac/2 (1).**

(*Report dated 12th January* 1891.)

E. H., female, aged four months. *Case*

October 22nd, 1890, by Dr. P., qualified deputy for Dr. W., Public Vaccinator, in four places. *Vaccination.*

November 17th, 1890. *Death*

"Erysipelas." *Certified cause*

Mr. N. *Certifier*

Direct from arm of child Mc.K., No. 100 in Register. *Source of lymph*

Vaccination stated to have been normal. *Vaccinator*

One. Vaccination stated to have been normal. *Co-vaccinees*

Apparently none, but the evidence as to whether lymph was taken from the arm or not, is contradictory. Father states vesicles "were not touched by Public Vaccinator," but according to statement of Dr. P. lymph was taken from it. *Sub-vaccinees*

Note.—It would, however, seem as if there was some error in this statement, as it is stated later that Dr. P. "did not inspect the arm and heard nothing of it till "about a fortnight afterwards."

The statements as to the condition of the child's arm on the 8th day are contradictory. *Course of vaccination and arm.*

Mother states she "noticed some redness around the "vaccination places and on the shoulder of the vaccina-"ted arm" on the 4th day, and that on the 8th this extended to the elbow; also that one vesicle had ruptured. Father states "the child's arm was going on well until "after the 8th day."

Dr. W. who inspected the arm on the 8th day says he is "confident that at that time there was nothing notably "irregular with it."

Dr. P. states he is "confident it was normal or he "would not have taken lymph from it."

Child was first seen by Dr. N.'s assistant on 10th day, October 31st, at which time there was "an inflammatory "blush about the elbow."

On November 2nd erysipelas was undoubted.

On November 3rd Dr. N. states there was "cutaneous "erysipelas" of vaccinated arm, "not immediately "round the vaccination places but from about the elbow "to the wrist." This subsequently extended over body and head, and child died exhausted.

The vaccination vesicles appear to have followed a normal course according to the evidence both of the mother and of Dr. N. At time of death three places had entirely healed; one had the scab still adherent.

Mother "applied nothing whatever to child's arm." *Treatment of vesicles*

Grooved lancet used, clean and in good order when seen. Vaccination station, not a surgery; no known case of infectious disease present on day of vaccination or inspection. Dr. P. had visited case of scarlet fever on morning of October 22nd, before vaccinating, but had disinfected and cleansed his hands. *Method of vaccination.*

Child stated by mother to have been "perfectly well" before vaccination. *Previous history.*

Not stated. *Family history.*

Rooms very dirty. Child poorly clad. When mother brought it for inspection on 8th day Dr. W. "said she "must have let it fall and accused her of having been "drinking." Father had been out of work for four months. Child not exposed to any known infection, but erysipelas prevalent in the neighbourhood at the time; two known cases near. Five cases notified in November, three of these on the same day, one being the case of E. H. Scarlet fever also notified on October 3rd and 4th a few yards from H.'s home. *General surroundings.*

Lane in which child's home was situated stated by Medical Officer of Health "in an unsatisfactory con-"dition owing to the defective character of the ashpits.' An ashpit privy eight yards from H.'s house described as in "a wet, offensive condition." *Sanitary condition.*

Reporter concludes the weight of evidence is in favour of the erysipelas not having appeared until after the 8th day, and considers this opposed to the view that it was invaccinated. He points out "that an efficient "cause of erysipelas was present in the neighbourhood "about the time," as shown by the cases notified, that scarlet fever was also present in near neighbourhood to the H's house, and that "the child was living under "very unfavourable general conditions."

He also draws attention to the fact that "the vaccinator had, shortly prior to the vaccination, been in "contact with a case of scarlet fever."

[T. D. A.]

CASE CLII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE MEDICAL OFFICER OF HEALTH OF B———.

(*Report dated 27th January* 1891.)

R. H. W. T., male, aged 14 weeks.

November 26th. By private practitioner (Dr. F.). Two insertions, with clean lancets.

December 17th, 1890.

"Erysipelas, five days."

Arm to arm.

Mother of vaccinee said this was a child (N.) who had also died from "the effects of vaccination." The mother of this child, Mrs. N., was interviewed and confirmed this statement, but the practitioner in attendance certified the cause of death as "meningitis "and convulsion" on December 23rd, and his attention was never drawn to its arm. In fact he never heard anything about its vaccination.

Mrs. N., however, said that her child was vaccinated by Dr. F. on December 19th, from an infant who had also died. In spite of prolonged research no record could be found of this latter case in the vaccination returns or death returns of the different registration districts.

No information obtainable.

None.

Inspected by Dr. F. on 8th day (December 3rd) and certified by him as successful. The child had worn a new shield since November 29th.

About (or after) December 7th, redness appeared between the two vaccination sites, which gradually extended down the arm to the tips of fingers. The mother, who had applied cream and cold water rags to the arm, took the child to the hospital, where lotion and ointment was ordered. It did not improve, and on the 15th was taken to a private practitioner (Dr. H.). At this time the vaccination scabs had fallen, leaving two "deepish ulcers," surrounding tissues hard and brawny, as were also both lower limbs. There was no erysipelas then on legs or arms, but a patch on each cheek and top of head. Dr. H. saw the child next day, and on 17th, when it died, sloughing of the buttocks occurring before death.

The infant appeared healthy up to time of vaccination, except that it had once been treated for constipation.

This was the first child. The parents occupied a single room, which was dirty and ill-ventilated. They were in fair circumstances and the father, a bricklayer, being out of work for some time before Christmas, were ill-fed.

Three other families occupied the house, which is situated in a court, approached by steps through an archway. W.C., a hopper, outside, but under same roof as washhouse. Ashes and refuse removed twice weekly by the sanitary authority. On December 6th a Mrs. H. came to town and occupied next room to the T.'s with two children, who had discharging abscesses in the neck. It was denied that either family entered the other's room; but the children played on the landing, and had to pass the T.'s door to go downstairs.

Absence of lymph record and of any collateral evidence as to co-vaccinees makes it impossible to formally set aside vaccination as causing the fatal result, but the regularity of the vaccination in the case of both vaccinifer and vaccinee up to the 8th day goes some way to exclude the operator from any act in, or direct share in, causing the erysipelas. Nor did the erysipelas appear till some 12 days after the vaccination. The defect in ventilation of the dwelling room may have had some predisposing influence; and it is not unlikely that the fatal erysipelas was brought about by direct infection from the H children.

[S. C.]

CASE CLIII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR **Ac 3 (1).**

(*Report dated* 19*th January* 189).

L. J. C., female, aged one month. *Case of.*

June 11th, 1890, by Public Vaccinator; four insertions. *Vaccination.*

June 21st, 1890. *Death.*

"Cellulitis following vaccination." *Certified cause.*

Arm to arm. *Source of lymph.*

T. E., male, age two and a half months, vaccinated together with four other infants from tube lymph furnished by another Public Vaccinator. The vaccinifer was a healthy child; its vaccination ran a normal course and presented three good vesicles and one "which "looked as if the sore had been rubbed." Its family history was good and other children in family were healthy. *Vaccinifer.*

None. (Twenty-two other children vaccinated on same day; no complaint made of any of them, and eight seen by reporter and found normal.) *Co-vaccinees*

When brought for inspection on 8th day (June 18th) the four vesicles had ruptured and coalesced and surrounding skin inflamed. *Course of vaccination.*

Infant taken on the 19th to private practitioner, but there is no note of the condition, save that on death certificate. This medical man attributed the unhealthy state to neglect and want of cleanliness. The arm had not been poulticed or subjected to application by the mother. *Course of illness.*

The child was not robust, but in the opinion of the Public Vaccinator was fit for vaccination. The mother was obviously neglectful, and the dwelling (wooden cottages termed "mere hovels") very dirty and miserable. No infectious disease known in vicinity at the time. *Other points.*

The vesicles probably inflamed by rough and careless handling; and the unhealthy surroundings sufficiently explain the course of events. *Summary of reporter's conclusion.*

[S. C.]

CASE CLIV., REPORTED TO THE LOCAL GOVERNMENT BOARD BY ONE OF THE BOARD'S INSPECTORS. **O3a 1.**

(*Report dated* 29*th August* 1890.)

J. C., male, age not stated. *Case of.*

April 17th, 1890, by Dr. H., Public Vaccinator. *Vaccination.*

June 1st, 1890. *Death.*

Not stated. *Certified cause.*

Human lymph. Source not stated. *Source of lymph.*

Not stated. *Co-vaccinees.*

Not stated. *Sub-vaccinees.*

No details given. Reporter states "child certainly "appears to have had inflamed arm and its vesicles are "said to have burst." *Course of vaccination.*

"Child suffered from vomiting and convulsions." *Course of illness.*

Not stated. *Treatment of vesicles.*

Illness commenced before child was vaccinated. *Previous history.*

Bad. Parents both delicate. One child died of "wasting disease." Mother one of fourteen children, many born dead, four only surviving. One died of phthisis. Grandfather died of phthisis. *Family history.*

Family lived in "one small dirty room." House ill ventilated. *General surroundings.*

Not stated, but in another report (Case CXX.) it is stated same vaccinator has "apparently not strictly *Method of vaccination.*

" adhered to the Board's instructions as to avoiding the " use of children as vaccinifers whose arms showed con- " spicuous areola."

Summary of reporter's conclusion. Reporter concludes child's death "would seem to " afford little ground for surprise, and despite its in- " flamed arm it would appear unreasonable to ascribe " the death to vaccination."

[T. D. A.]

Ac 1 (i) CASE CLV., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated* 12*th December* 1890.)

Case of. C. G. C.

Vaccination. November 4th, 1890, by private practitioner (Dr. L.). Single insertion. No record kept. Tubes not labelled. Lancet clean, but rough, as if it had at one time been rusty.

Death. November 23rd, 1890.

Certified cause. Vaccination 14 days; erysipelas 7 days.

Source of lymph. Not direct arm-to-arm (mother's statement). "Pro- " bably" from a child vaccinated the previous week, but no definite information obtained as to vaccinifer, or as to co-vaccinees, except that of two other children, certified by Dr. L. as being vaccinated on same day (November 4), one had the arm inflamed down to the elbow.

Co-vaccinees.

Course of vaccination. According to the mother the pock did not come up properly, but watery matter ran from it all the first week. Redness appeared round it on November 10th (7th day). Dr. L. said that when seen on 8th day there was some inflammation around the vesicle, which was discharging and looked as if it had been rubbed or broken. No lymph was taken from it. The mother procured a shield for it on the 10th.

Course of illness. Child restless and seemed ill from 6th day. On November 13th (10th day) it seemed very ill, said to have bronchitis for which poultices ordered, the arm became inflamed to fingers on 14th, and blebs formed on forearm on 15th. Child was attended till 18th by Dr. L., and on 19th was taken to Dr. S. who found then no redness at site of vaccination, the pock looking healthy but as if it had lost the original scab, and acquired a fresh one. There was "wandering ery- " sipelas" of various parts of the body, especially diffuse redness of skin of forearm and hand, and œdema of the head on left side. The child died from exhaustion four dyas afterwards.

Previous history. Good. Child stout; was suckled.

Family history. Father suffers from gout; mother thin and pale. Three other children, healthy and had no trouble when vaccinated.

Surroundings. Dwelling, a public-house. Child not brought into contact with customers. No drain to house, waste liquids being thrown into an open brick channel in the brickyard, which discharges into roadside gutter in street in front.

Privies and stable not near house.

There was more erysipelas in the town in the month of November than any other month of the year, one case not far from C.'s residence; but neither Dr. L. nor Dr. S. had any other cases under their care at the time. The reporter ascertained that six cases of erysipelas notified during the year were of children of vaccination age; but in only one of the three in which there was definite information, was vaccination directly connected with it, a case where vaccination was done while scarlet fever was in the house. For another see Case CLVI.

Summary of reporter's conclusion. No positive opinion could be given of the cause of the erysipelas in the case reported on, and unfortunately neither the source of the lymph nor its effects in collateral cases could be ascertained with certainty. The abnormal course taken and the early inflammation seem to point to something wrong in the quality of the lymph, but there is no evidence whether or not it produced a similar effect in other cases.

Sanitary condition and state of cleanliness not "all that could be desired," but "better perhaps than many" in the town.

[S. C.]

CASE CLVI., REFERRED TO IN MINUTES BY THE MEDICAL OFFICER OF THE LOCAL GOVERNMENT BOARD. Ac 2 (8. v

(*Report dated* 21*st March* 1891.)

Case of. B. P., male, aged 2 months.

Vaccination. June 10th, 1890, by Public Vaccinator.

Death. August 19th, 1890.

Certified cause. "Erysipelas."

Vaccine. C. H., female, a healthy child having three good marks (one insertion failed), the arm having done well.

Co-vaccinee. One, R. B., male; did well, and had four good marks.

Sub-vaccinees. Six in number; four of whom seen by reporter. In three the arms had done well, and healed within a month, four good cicatrices. The fourth, L. R., male, had only two pocks, one delayed in healing because the mother thinks it was seated in a transverse fold of the skin of arm, where it was very fat. This had left a large oval scar, but no thick tissue, as if there had been deep ulceration. The mother said there was no unusal red- ness around the pocks.

Course vaccination. Normal. On 8th day lymph taken from the vesicles. The grandmother said that two pocks never healed, or scabbed, but the mother said two of them healed in about a month, but two did not, being covered with blackish scabs, which kept coming off. Fuller's earth was applied to the skin.

Course illness. Erysipelas began about latter part of first week of August, or eight weeks after vaccination. Both mother and grandmother agree that it did not begin in the vaccinated arm, but in the neck on the same side just below the ear; there had previously been a sore behind the ear. From this point redness spread over neck, back and chest, belly and arms; and blisters formed on the face. The child was seen by a surgeon, Mr. S., who notified it on August 8th. At that time he said the vesicles were not healed, and were discharging, the arm around them being much inflamed.

Family history. The mother had erysipelas when five months pregnant, and had removed to her mother's house before the child's birth. No information could be gleaned as to possible contact of clothing worn by Mrs. P. at the time of her illness being in contact with the child.

Dwelli The house was clean, yard well-paved. The cellar contained a spring and water drained away by an en- trapped opening in the cellar wall, but no offensive smell from it at any time. Street not sewered, waste liquid being carried away by open channels.

No other illness in the house at the time.

Summ of report's conclus. Improbable that the fatal erysipelas was connected with vaccination. Long interval since date of vac- cination, and freedom of sub-vaccinees show that ery- sipelas could not have been inoculated at time of vac- cination. It is more probable that the inoculation was at the sore behind the ear and possibly the infection was derived from the mother's case. But at that time erysipelas was fairly prevalent in the town. (*See* Case CLV.)

[S. C.]

CASE CLVII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY ONE OF THE BOARD'S INSPECTORS. 08

(*Report dated* 25*th March* 1891.)

Case E. B., female, age?

Vacc tion. December 5th, 1889, by Public Vaccinator; three insertions (Cooper Rose instrument, kept clean).

Dea December 22nd, 1890.

Certi cause "Bronchitis."

Sour lymp Tube of lymph from H. C., vaccinated November 14th.

Vacc fat Scars, cicatricial (slightly) in centre; the vesicles had been normal.

Co-v cine December 5th:—S. D., male; E. F., female. } All normal.
December 19th:—G. W., male; D.W., male. }

On 4th day a measly rash on face and legs. (Mother does not think measles prevalent at time.) Inspected on 8th day, vesicles not opened.

Slight redness around vesicles in 2nd week; and a swelling formed under the arm, which was poulticed and subsequently incised. The abscess closed up, and was followed by spreading inflammation over the chest and down the arm. This disappeared, but mother does not think the child ever became perfectly strong. It died from bronchitis a year later.

The vaccination sores healed within two months; they never discharged. When under vaccination the child was wearing a blue merino frock, the sleeve being "cut up and pinned." Cream was applied to the places after the 8th day. Nothing was said by the mother at the time of the child's fatal illness to infer that this was in any way connected with its vaccination or axillary abscess. No illness in neighbourhood. House clean and sanitary.

Axillary abscess probably due to the dyed dress or to the treatment of the vaccinated arm. No sufficient grounds for connecting the death with the vaccination.

[S. C.]

CASE CLVIII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.*

(*Report dated* 6*th April* 1891.)

E. P., female, aged 9 months.

March 2nd 1891, not as stated in death certificate, March 3rd, by Mr. H. in two places, privately.

March 10th, 1891.

"Teething convulsions, 10 hours (vaccinated with "fresh calf lymph 3.3. 1891)."

Mr. H., the vaccinator.

Stated to be Dr. R's calf lymph, purchased by Mr. M. from chemist at P. No record or reference could be obtained.

One child stated to have been vaccinated March 3rd with remainder of tube used for E. P. Vaccination said to have been normal, healing only of one scab delayed, owing to its having been rubbed.

None. Vesicles not opened.

On March 9th, 8th day after vaccination, nothing abnormal was noticed. On March 10th two normal vesicles, "not burst or inflamed," were seen by vaccinator, who was called to see the child then in convulsions, from which she did not rally. She died in the course of the day.

An ordinary lancet used, with point "purposely "broken off;" slightly rusted when inspected, but said to be always cleaned with carbolic solution after use. Records of vaccination not kept.

Child delicate. Vaccination twice deferred: once for bronchitis (?), once for discharge from ear. Believed to be fairly healthy at time of vaccination, but was teething and had suffered from restlessness and screaming fits on waking. Mother stated the child had always "been very sleepless.

Mrs. P. had had three other children; one was born dead; one died young, cause unknown, but believed to be some disease of liver; the third, pale, delicate, and suffers from "ophthalmia tarsi," always worse when teething. Four cousins stated to have died "in con-"vulsions from teething."

Nothing of importance noted.

Reporter concludes the facts "do not appear to give "any support to the view that this child's death was a "result of vaccination," although possibly the "slight "constitutional disturbance" due to the vaccination might "concurrently with the teething, have had some "share in determining the attack of convulsions." He notes that there was "extremely little evidence of "constitutional disturbance" from the vaccination, but that the child was evidently suffering from "nervous "irritation" due to teething, and that there was presumably a "neurotic family tendency."

[T. D. A.]

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* *This case is also amongst those brought to the notice of the Commission with a view to their investigation; being the same as that numbered as Case* 41 *on page* 251. *The case was not, however, investigated by a medical man on behalf of the Commission.*

CASE CLIX., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR. Ac/2 (2. V.)

(*Report dated* 13*th Febeuary* 1891.)

W. J. J., male, aged 26 days. *Case of.*

December 30th, 1890, by Mr. F. W. V. privately; in three places. *Vaccination.*

January 15th, 1891. *Death.*

"Vaccination; erysipelas." *Certified cause.*

Mr. F .W .V., the vaccinator. *Certified by.*

Not known. No record kept. *Source of lymph.*

Two other children stated to have been vaccinated with same lymph "without any bad result," but no record kept. *Co-vaccinees.*

None; but vesicles pricked. *Sub-vaccinees.*

Two small vesicles rose; of these one was "insignificant." *Course of vaccination and illness.*

Vaccination otherwise apparently normal on 8th day. On 9th day, Jan. 7th, child seemed in pain, but arm not inflamed. Jan. 8th child "feverish and restless," arm somewhat swollen and inflamed. The child became worse, "suffering from undoubted erysipelas" and died January 15th.

Lancet used; stated to have been "perfectly clean" and used only for vaccination. Vaccinator stated he had not recently been exposed to infection. *Method of vaccination.*

On 8th day one vesicle was pricked. There was not sufficient lymph to take. *Treatment of vesicles.*

Stated to have been "a fine strong child" at birth. *Previous history.*

Mother "fine, healthy looking woman." Stated to be suffering from abscess of the ear. Father "taken ill "with sore throat" January 8th. He had been feeling ill some days previously. Occupation, that of dock foreman, said often to expose him to risk of infection. Four other children, one said to be "rather delicate," the others "strong and well." *Family history.*

Parents well to do. House clean and comfortable Child had not been out since birth. *General surroundings.*

No sanitary defect noted. *Sanitary condition.*

Reporter concludes that the child's illness was possibly due to some infection common to it and the father, such as "sewer-effluvia"—although there is no evidence of this; or that it may have "caught the infection from its father," or that it may have become inoculated from its mother's abscess in the ear, "the "vaccination having nothing to do with it" (the injury) "except as furnishing a breach of surface at which the "septic poison found entrance." *Summary of reporter's conclusion.*

[T. D. A.]

CASE CLX., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR. O1./O

(*Report dated* 12*th February* 1891.)

J. H. M., male, aged three months. *Case of.*

January 6th, 1891, by Mr. J. P., Public Vaccinator, in four places. *Vaccination.*

January 13th, 1891. *Death.*

"Pneumonia; vaccinia." *Certified cause.*

Mr. A. P——n. *Certified by.*

Direct from arm of E. R. *Source of lymph.*

Small, clear skinned, and healthy. Of healthy parentage; vaccination normal. *Vaccinifer.*

One, "a fine healthy child." Vaccination normal. *Co-vaccinees.*

None. Child not brought up for inspection owing to its being ill. *Sub-vaccinees.*

Normal up to 6th day when there was a little redness about the points of vaccination. Next day it seemed unwell and screamed. It was taken to Mr. A. P——n, who found it to be suffering from pneumonia, he ordered poultices to *chest*. He did not consider that the *Course of vaccination and illness.*

"vaccinia was in any way causing the pneumonia, "which he judged was probably caused by exposure."

On 8th day it had a convulsion and died during night.

Method of vaccination. Careful and satisfactory.

Treatment of vesicles. None needed. The arm was not injured in any way.

Previous history. Stated by mother to be quite well previous to vaccination, by reporter to have been sickly. It had had snuffles from birth.

Family history. Mother "stout and strong." The two children aged 1¼ and 2¾ years "looked weak and sickly and were "apparently stamped with congenital syphilis." Five other children had died from consumption of the bowels. The whole family supposed to be "diseased from "birth."

General surroundings. Very dirty, and most unhealthy.

Sanitary condition. January 6th, the day of vaccination, was very cold with a N.N.E. wind; the child was the last of 20 children vaccinated, and was taken home late (a distance of ¾ mile). The week following was exceptionally cold. On January 10th the thermometer registered a temperature of 12° at Greenwich; 19° below the average for 20 years. Deaths from pulmonary disease, which in five preceding weeks had risen from 487 to 991, reached a total of 1,018, an excess of 412 over average of previous years, during the week of J. H. M.'s death.

Summary of reporter's conclusion. The child died of acute pneumonia, which the reporter concludes was due to the climatic conditions, and by inference not to "cow-pox or effects of vaccination."

[T. D. A.]

O1. O

CASE CLXI., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE PUBLIC VACCINATOR.

(*Report dated 17th February* 1891.)

Case of. D. R., male, aged 12 weeks.

Vaccination. February 4th, 1891, by Mr. H., Public Vaccinator, in four places.

Death. February 11th, 1891.

Inquest. February 13th, 1891.

Verdict of Coroner's jury. "That the deceased died naturally from syncope, due "to exposure to the weather on the night of its death "whilst suffering from a slight amount of irritation, the "result of vaccination."

Source of lymph. From child No. 426 in register.

Vaccinifer. Presumably a fitting case from which to take lymph. Child carefully examined. Enquiries also made as to sanitary conditions of its home and surroundings.

Co-vaccinees. Nine. Vaccination said to have been normal in all.

Sub-vaccinees. None.

Course of vaccination and illness. Mr. H., when he inspected the child on the 8th day said it had "a grand arm." He noted nothing amiss with the arm or the child.

Father stated at inquest that the arm was red from "shoulder to elbow" *on 8th day*, and the mother said the child was fretful and irritable. She, however, made no complaint of its health to the doctor. On arriving at home 10.20 p.m. the child was found to be dead. It is said to have suffered for some days previously from diarrhœa.

Method of vaccination. Dr. H. appears to be a careful and successful vaccinator. He carries out with exactness all the Local Government Board's instructions, and has five times received the special Government grant.

Treatment of vesicles. The vesicles do not appear to have been opened, or in any way injured.

Previous history. Child said to have been healthy.

General surroundings. The mother left home about 1.40 p.m. on the day of inspection and visited several people after leaving the station. She returned home in company with her sister, who carried the child, at 10.20 p.m. Both were somewhat the worse for drink. The day was cold and very windy, the child was wrapped in a shawl, but from the evidence does not appear to have been suffocated.

Summary of reporter's conclusion. Reporter did not himself investigate the case, considering no further evidence could be added to that brought forward at the inquest.

Dr. H. stated "that the child had certainly not died "of vaccination." Dr. C., who was called in when the child was dead, stated at the inquest that he believed it had died from syncope caused by exposure for a length of time to a low temperature while suffering from a certain amount of constitutional disturbance due to vaccination. A verdict was given in accordance with his evidence.

[T. D. A.]

CASE CLXII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE PUBLIC VACCINATOR. **G O**

(*Report dated 25th March* 1891.)

Case of. C. D., male, aged ?

Vaccination. January 29th, 1891, by Dr. W., Public Vaccinator.

Death. March 13th, 1891.

Certified cause. "Vaccinia 6 weeks; varicella 3 weeks; exhaus- "tion."

Certifier. Dr. H., M. O. H.

Source of lymph. Direct from arm of J. G., No. 364 in register.

Vaccinifer. Vaccination normal.

Co-vaccinees. Five. Three on January 29th, and two some two weeks later from same lymph stored in tubes.

Vaccination normal in all.

Reporter inspected in all 17 children most closely connected by lymph with C. D., viz.: vaccinifers for three generations, and co-vaccinees for three generations back, and sub-vaccines of one of C. D.'s co-vaccinees. All had made good recoveries, one case only showing slight inflammation during the second week.

Sub-vaccinees. By inference none.

Course of vaccination and illness. *8th day.*—Child not inspected.

15th day.—Vaccination pocks normal. No areola. Scabs drying (Dr. W.)

22nd day.—The two upper and two lower pocks had coalesced, they were scabbed over and dry. Child not ill (Dr. W.). Mother had noticed one "spot" on nose.

24th day.—Arm œdematous. Vaccinated area 1½ in. square, areola ¼ in. One spot on cheek, "like vaccination vesicle on 7th day." Child poorly (Mrs. D.).

25th day.—Eruption on body like "heat bumps" noticed by mother.

26th day.—Ring of confluent vesicles round pocks, which were covered with a dark crust (Mr. H.).

29th day.—All four places had coalesced, and were covered with a single scab. An eruption had appeared on the head and chest, which was regarded by Dr. W. and Mr. H. as varicella.

Fresh vesicles subsequently formed round the vaccination pocks coalescing with them and causing them to spread. They developed also on the face, head, body, and in the mouth, the latter prevented the child from sucking, and it died exhausted on the 45th day after vaccination.

The eruption seems to have commenced as unicellular vesicles, which spread peripherally to about the size of a shilling. For the most part they became pustular, covered with scab, and with a slight areola. They were apparently not gangrenous.

Method of vaccination. Dr. W. stated to be a careful vaccinator; Local Government Board instructions carefully carried out. Lancets cleansed and sterilised. Infant schoolroom used as vaccination station.

Treatment of vesicles. No shield used. No application made to the arm except starch ordered by Dr. W.

Previous history. Child stated to have been healthy before vaccination.

Family history. Not stated. Mother's breasts became inoculated from child's mouth, but quickly healed. She had previously suffered from fissures.

General surroundings. Chicken-pox prevalent in the village at the time. Nothing else of importance noted.

Sanitary condition. Six ash-pit privies 30 yards from house in very offensive condition when inspected.

Summary of reporter's conclusion. Considering the normal course in vaccination in the 17 cases investigated and the care exercised by the

vaccinator, reporter considers that neither the lymph nor the operator can be blamed. He draws attention to the points in which this case resembles that of Case LVIII.* of this series of reports, and that recorded by Mr. Hutchinson (Med. Chir. Trans. 1882, p. 1), as "*vaccinia* gangrenosa," but he inclines to the belief that it was really akin to another class of cases described by Mr. Hutchinson as "*Varicella gangrenosa*" on the following grounds:—

1. That vaccination appeared to be normal until the 15th day.
2. That varicella was prevalent at the time, and that the vaccination was performed in the infant school, a place peculiarly liable to infection. On the other hand, he points out that the mother's breast was inoculated although the preponderance of evidence is against the possibility of inoculating *varicella*.

[T. D. A.]

CASE CLXIII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.

(*Report dated 6th April* 1891.)

F. M. W., female, aged four months.

October 30th, 1890, by Dr. T., Public Vaccinator, in four places.

November 9th, 1890.

"Vaccination nine days; erysipelas four days."

Dr. R., who attended the child, stated that he had "no notes or recollection of the case." He at first denied having given the certificate, but being confronted with it, said "there must have been some "mistake."

Direct from the arm of J. H. H.

Vaccination stated to have been normal, and child reported to be in good health.

Two. Vaccination normal in each. Both children well. Four children were subsequently vaccinated with lymph from same source stored in tubes, all stated to have done well.

None.

Child not taken for inspection on 8th day, November 7th. Mother states that on November 3rd and 4th the child began "to fail at the breast," and that "the arm "and the places on it had become white." There was no redness until November 7th, and this apparently only areola. No explanation of the condition of the arm could be obtained. Further questioned Mrs. R. stated that there was not any redness or swelling of the arm or of any part of the body, and that there was no diarrhœa or vomiting. The child according to mother "drooped away."

A little cold cream applied a few days after vaccination.

Dr. T. is stated to be a Public Vaccinator of large experience, and to have obtained the Government grant on several occasions. His lancet was clean and well kept when inspected.

Child was taken to Dr. R. a fortnight before vaccination for "refusing the breast."

Parents young and apparently healthy. F. M. W. was their first child.

No evidence that the child was exposed to infection. On November 2nd it was taken by the mother to a "religious service" between 6 and 9 p.m. She states the child was well wrapped up.

"Far from good." One privy cesspit, rarely emptied, serves for three houses. Shops and refuse thrown on the gardens, or down open gullies connected with a large open cesspit seldom cleared, and offensive when inspected.

Reporter points to the "utter absence of corroborative "evidence of erysipelas," and suggests "marasmus or "some such diathetic affection" as an alternative cause of death. He draws attention to the fact that the child was taken to Dr. R. a fortnight before it was vaccinated for failing to take the breast, and to the mother's statement that it was "drooping away," but states he "could get no evidence of wasting." He thinks it possible that cold taken on the evening of November 2nd "might have been the exciting cause of "her illness."

He considers that "the history of the lymph source "and the freedom of ill consequences of vaccinifer and "co-vaccinees point strongly towards exculpation of "vaccination as having been in any way concerned "with the child's death."

[T. D. A.]

CASE CLXIV., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR. **Aa 2 (3).**

(*Report dated 10th April* 1891).

Case of

E. G. C., female, aged four months.

Vaccination.

October 13th, 1890, by Dr. R., Public Vaccinator, in three places.

Death.

November 23rd, 1890.

Certified cause.

"Erysipelas after vaccination, 35 days."

Certified by.

Mr. E.

Source of lymph.

From arm of child B.

Vaccinifer.

Vaccinated October 6th, with lymph from N. V. E. Healthy child; vaccination normal; no complications. Three normal scars.

Note.—Five other children vaccinated with same lymph as child B. Vaccination normal in all, one child having, however, only *one* scar.

Co-vaccinees.

One. Vaccination normal.

Sub-vaccinees.

None.

Course of vaccination and illness.

Arm stated by Dr. R. to have done well until 7th day, when redness appeared round two lower pocks. Mother states the arm did well until about October 24th or 25th, the 12th or 13th day. During last few days of October a deep abscess formed in axilla, which mother would not allow Dr. R. to open. Mother poulticed it, and it broke but did not heal. On November 12th child was taken to Mr. E. At this time there was erysipelas of arm and hand, extending to neck, shoulder and across chest. Vaccination wounds had coalesced, and were covered by sloughs. Child had dry tongue, constant vomiting, and was much exhausted. It died November 23rd.

Method of vaccination.

Not stated. Vaccination station good.

Treatment of vesicles.

On the 7th day mother wrapped the child in a coloured woollen shawl without protecting the vesicles, two of which stuck to it. The vesicles were opened by Dr. R. on 8th day, and lymph was taken from them. The arm apparently continued to do well for four or five days. Mother to "make the places heal" applied "bread "poultices, cold cream, linseed oil, and zinc ointment," to the wounds, "constantly and with vigour, with her "naked (and dirty) fingers."

Previous history.

Stated to have been good."

Family history.

No details given. Mother young. E. G. C. was her first child.

General surroundings.

Mother stated to be inexperienced and unintelligent.

Sanitary condition.

Satisfactory.

Summary reporter's conclusion.

Reporter concludes "that the death of E. G. C. can "only indirectly be referred to vaccination," and that it is rather "ascribable to the effects of the handling "to which the opened vesicles of the child were "subjected by her ignorant and dirty mother," and above all "to the use of the coloured shawl."

[T. D. A.]

CASE CLXV., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE REGISTRAR-GENERAL.* **O1. 0**

(*Report dated 28th April* 1891.)

Case of.

E. D., female, aged four months.

Vaccination.

April 15th, 1890, by Mr. W., Public Vaccinator, in three places.

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* *Compare also Cases LI., LXXV., and CXCIV.; and Cases* 173 *and* 214 (*on pages* 350 *and* 402.)—*T. D. A.*

* *This case is also amongst those brought to the notice of the Commission with a view to their investigation; being the same as that numbered as Case* 40 *on page* 251. *The case was not, however, investigated by a medical man on behalf of the Commission.*

Death. May 19th, 1890.

Certified. cause. "Axillary abscess after vaccination, congestion of the "lungs four hours."

Certified by. Mr. W., vaccinator.

Source of lymph. Direct from arm of child M. M., aged 2½ months.

Vaccinifer. A plump healthy child. Vaccination normal.

Co-vaccinees. One. Vaccination normal.

Sub-vaccinees. None.

Course of vaccination. On the 8th day no inflammation of the arm. Subsequently there was "some oozing" from the vesicles which had been pricked, and some enlargement of axillary gland. The arm was never unduly red. Scabs formed normally, the swelling in the arm-pit subsided without further trouble, and except for some delay in the detachment of the scabs, vaccination pursued a normal course. Mother states that the arm "appeared almost well, and the scabs seemed ready to "drop off" at the time of the childs death. There was never any abscess or suppuration in the axilla.

Course of illness. About May 12th, the whole family were attacked with epidemic influenza. The baby became feverish with a cough and some shortness of breath. This suddenly became worse, and it died May 19th. Mother is stated never to have attributed its death to vaccination.

Method of vaccination. Vaccination performed at surgery. A "Warlomont's "needle" used, cleansed between each vaccination. Clean and bright when inspected. Mr. W.'s vaccination stated to be "well and carefully performed."

Treatment of vesicles. No application to vesicles except lotion ordered by Mr. W. No shield used.

Previous history. Child said to be rather "puny," but thought by mother to be well when vaccinated.

Family history. Mother is delicate looking. Father not seen. Eight living children. No details given.

General surroundings. Cottage crowded and not very clean.

Sanitary condition. Not stated.

Summary of reporter's conclusion. Mr. W. states that being hurried and overworked "the certificate of death was given by him under a "misapprehension," the father having spoken of the swelling in the child's arm-pit as "an abscess." Subsequently Mr. W. attended the D. family with influenza "and came to the opinion, after hearing the mother's "account of the symptoms, that the baby had really "died from the effects of influenza." The reporter concurs in this opinion.

[T. D. A.]

Ac 1&2 (2. V).

CASE CLXVI., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.*

(*Report dated 20th April* 1891.)

Case of. L. B., female, age not stated.

Vaccination. January 15th, 1891, by Dr. W. privately, in two places.

Death. February 13th, 1891.

Certified cause. "Exhaustion from abscess on arm, axilla, and breast, "with sloughing, about three weeks after the vaccina- "tion on January 13th."

Certified by. Mr. W. T. C.

Source of lymph. No record kept, but stated to be from arm of child H.

Vaccinifer. No record. Child H. stated to have been the vaccinifer, is healthy, and vaccination normal.

Co-vaccinees. Stated to have been none, but no record kept.

Sub-vaccinees. Children stated to have been vaccinated from L. B., but no record kept, and no evidence of any could be obtained.

Course of vaccination and illness. Arm inspected and stated to have been normal on 8th day. Vesicles opened. Next day arm began to swell round the vaccination wound, swelling gradually extending to shoulder and elbow. The arm became inflamed, and "a deep ulcer" formed at one of the points of vaccination. About a fortnight after vaccination January 30th, child was taken to Dr. C. There was then an erysipelatous blush, with "well-marked "line of demarcation," extending from elbow to shoulder, neck, scalp, and side of face, also an axillary abscess extending to front of chest. Subsequently "deep "sloughing ulcer appeared" over the left pectoral muscle. The child did not suffer from convulsions. Dr. C. regarded the case as one of "undoubted phlegmanous "erysipelas followed by secondary abscesses."

Treatment of vesicles. After vesicles were opened mother continued to apply bread and milk poultices to them. Also fuller's earth with her finger, and a feather from a "newly-killed "fowl."

Method of vaccination. Cooper Rose needle used. Clean when inspected. Spatula used for putting on the lymph covered with "dried blood." Mr. W. keeps no record of his vaccinations.

Previous history. Stated to have been healthy before vaccination.

Family history. Mother has had nine children, and two miscarriages. One child delicate and strumous looking. No history of syphilis.

General surroundings. Child not exposed to any known infection.

Sanitary condition. "Above the average."

Summary of reporter's conclusion. Reporter states that "the absence of any record of "lymph used" makes it "impossible to speak definitely "as to the part played by vaccination" in causing the child's death. He considers that the late appearance of the bad symptoms and the fact that the vaccinifer was healthy tends "to set aside vaccination *qua* "vaccination as an efficient cause of the trouble," but he draws attention to the "condition of Dr. W.'s instru- "ment." He further concludes that "putting vaccination "on one side . . . . the early and constant poulticing "of the arm by the mother, and the rude application "of fuller's earth to it by her (with possibly other sub- "stances) might well have given rise to the fatal "erysipelas."

[T. D. A.]

CASE CLXVII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.*

Ac 2

(*Report dated 7th May* 1891.)

Case. M. I. W., female, aged six months.

Vaccination. February 18th, 1891, by Dr. B., Public Vaccinator, privately, in three places.

Death. March 14th, 1891.

Certified cause. "Erysipelas following vaccination."

Certified by. Dr. B., the vaccinator.

Source of lymph. Tube lymph, "humanized," from N.V.E. Tube &c. opened for previous vaccination on same day, but was immediately resealed.

Co-vaccinees. One, vaccination normal. Three tubes were filled from this child's arm and with them Dr. B. began his public vaccinations. No case of abnormal vaccination from this strain of lymph had occurred up to April 21st.

Sub-vaccinees. None.

Course of vaccination and illness. Vesicles were rubbed about 7th day. On 8th day when inspected the vesicles were ruptured, and with some redness around them according to Dr. B. not of an erysipelatous character. Mother states the redness did not begin to extend until March 4th (the 15th day). On March 6th Dr. B. "found the arm erysipelatous"; subsequently the erysipelas spread to chest, abdomen, and neck. On March 11th child became convulsed, the convulsions continued till it died March 14th. Parents state the erysipelas had nearly subsided before child's death. The scabs appeared ready to come off.

Method of vaccination. Lymph blown from tube on vaccinators thumb-nail and transferred to the arm. Dr. B. was not attending any septic cases at the time. A few scarlet fever cases in the district but none visited by Dr. B. on February 18th previous to vaccinating M. I. W. An ordinary lancet used, kept only for vaccination, cleansed with water between each operation. Clean and bright when inspected.

Treatment of vesicles. Vesicles rubbed on 7th day. No dressing applied to the arm No shield worn, but linen lining of child's coloured woollen dress found soaked with discharge when inspected.

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* *This case is also amongst those brought to the notice of the Commission with a view to their investigation; being the same as that numbered as Case 47 on page 252. The case was not, however, investigated by a medical man on behalf of the Commission.*

* *This case is also amongst those brought to the notice of the Commission with a view to their investigation; being the same as that numbered as Case 42 on page 251. The case was not, however, investigated by a medical man on behalf of the Commission.*

Child stated to have been healthy, but was teething when vaccinated, and had suffered in January from bronchitis.

Parents healthy. Five other living children. No details given.

House clean, not overcrowded. No illness had occurred for two years. Child not known to have been exposed to any infectious disease.

No obvious defect noted.

Reporter considers the delay in the appearance of the erysipelas favours the opinion that there was some accidental introduction of septic poison into the arm, probably through the medium of the sleeve.

[T. D. A.]

Case CLXVIII. reported to the Local Government Board by the Local Registrar.*

(*Report dated 4th May* 1891.)

E. K., female. Age not stated.

March 4th (? 5th), 1891, by Mr. A., Public Vaccinator, in four places.

Date not stated, by inference March 21st, 1891.

"Vaccination, 23 days; erysipelas, 10 days; gangrene; convulsions, 2 days."

According to register from arm of M. T., No. 385, but Mrs. T. denies that any children were vaccinated from her child; and the register is so incorrectly kept that no reliance can be placed on it.

Doubtful. M. T., No. 385, is a sickly-looking and "extremely filthy" child, unlikely to be chosen as vaccinifer. Evidence on this point is conflicting, and in favour of another child, No. 383, having really been the source of lymph.

According to register two. In one vaccination normal; in one healing was delayed through an injury to one of the scabs.

Two children stated by Mrs. K. to have been vaccinated from E. K., but no entry to this effect in register. All these entries are so uncertain as to be valueless.

On 8th day when inspected vesicles stated not to have been broken. They were all opened. Arm continued to do well until evening of 9th day, when mother noticed some redness "just below the pocks." This spread to elbow, wrist and across chest, fading in one place and reappearing in another. On March 13th the child was seen by Dr. J. who states there was then "superficial erysipelas" of the arm. Notwithstanding treatment child grew worse. A few days before death blisters "followed by superficial sloughs" appeared on buttocks. Nothing abnormal was noticed in the pocks, "which remained covered with scab until death."

All opened on 8th day. Subsequently dressed daily with fresh cream.

Reporter has sometimes seen Mr A. take lymph from inflamed arms, and states he is not careful in cleansing his lancet after each vaccination. His register is very incorrectly kept. Vaccination station used only for that purpose.

Child stated to have been healthy before vaccination, but to have "failed" from that day.

Father and mother and their one other child stated to be healthy.

House fairly clean. No known illness in the house or immediate neighbourhood, but erysipelas prevalent in the district, ten cases notified during march.

No drains in the house, but yard filthy and surroundings insanitary.

Reporter concludes that E. K.'s illness is not "attributable to any fault of the lymph . . . . nor to any circumstances attending the operation" although "the uncertainty as to its (the lymph) source is unsatisfactory." He considers the late date at which the erysipelas appeared points to infection subsequent to vaccination; and that the insanitary surroundings of the house and the prevalence of erysipelas in the district at the time indicate possible sources of infection.

Note.—The source of the lymph in this case was uncertain; the register was quite unreliable. The vaccinator was suffering from cirrhosis of the liver and hæmatemesis, his instruments were not carefully cleaned, and he was known sometimes to take lymph from inflamed arms.

[T. D. A.]

* *This case is also amongst those brought to the notice of the Commission with a view to their investigation; being the same as that numbered as Case 43 on page 251. The case was not, however, investigated by a medical man on behalf of the Commission.*

Case CLXIX., reported to the Local Government Board by the Local Registrar.* Ac (3). 1&2

(*Report dated 1st May* 1891.)

E. W., female, aged five months. *Case of.*

February 16th, 1891, by Mr. S., Public Vaccinator, in three places. *Vaccination.*

April 7th, 1891. *Death.*

"Vaccination, 28 days; cellulitis." *Certified cause.*

Mr. P——d. *Certified by.*

Direct from arm of C. B. *Source of lymph.*

A fine healthy child; of healthy parents. Vaccination normal. No history of any disease in house or immediate neighbourhood. *Vaccinifer.*

One. Vaccination normal, without complication. *Co-vaccinees.*

None. Vesicles not opened. *Sub-vaccinees.*

On 8th day, when inspected, there were two good vesicles. One place did not take. Nothing abnormal was noticed until a week or ten days later a swelling appeared in axilla of vaccinated arm. Child was attended by Mr. P——n, unqualified assistant to Mr. P——d. Mother states that he advised poultices, and subsequently (about March 7th), as swelling did not subside, forcibly removed the scabs with which the vaccination wounds were covered "to allow the matter "free vent." After the removal of the scabs the arm inflamed, and subsequently inflammation spread to the body, the extremities and head. Child was not seen by Mr. P——d until April 5th, the erysipelas had faded from the arm, but there was still "some erysipelatous "redness of the legs and side of neck." The axillary swelling had subsided but the child was very weak and died on April 7th. Mother states that there was "no "discharge from any part of the child's body at any "time during her illness." *Course of vaccination and illness.*

Note.—Mr. P——n had since died of influenza. His day book stated, he was first called to see E. W. on March 25th, nearly a month later than stated by Mrs. W., but Mr. P——n is said to have been "exceedingly "intemperate," and "not much reliance is to be placed "on the entries."

Cooper Rose needle used, disinfected with carbolic after each vaccination. Instruments scrupulously clean when inspected. *Method of vaccination.*

The vesicles were not opened. *Treatment of vesicles.*

Mother applied cream and house leek to the wounds. No shield used. Child wore plain print dresses.

Child said to have been healthy before vaccination. *Previous history.*

Parents apparently healthy. Four children; three healthy, one suffering from hip disease, but with no discharge. *Family history.*

House fairly clean. No case of infectious disease in the house. Death from membranous croup in opposite house, but mother stated she did not know the people and there had been no communication. *General surroundings.*

Good. *Sanitary condition.*

Reporter concludes from the evidence "that no blame "can be attached to either the Public Vaccinator or to "the lymph," and he considers that the "treatment of "the vaccination sores by the mother with cream, &c., "and the re-opening of the vaccination wounds by Mr. "P——n, afforded ample opportunity for the introduction of septic material." *Summary of reporter's conclusion.*

[T. D. A.]

Case CLXX., reported to the Local Government Board by the Local Registrar.† 03a 0

(*Report dated 30th June* 1891.)

K. I. B., female, aged 22 days. *Case of.*

May 27th, 1891, by Mr. P. (Assistant Medical Officer of B. G. Workhouse Infirmary), in four places. *Vaccination.*

* *This case is also amongst those brought to the notice of the Commission with a view to their investigation; being the same as that numbered as Case 48 on page 252. The case was not, however, investigated by a medical man on behalf of the Commission.*

† *This case is also amongst those brought to the notice of the Commission with a view to their investigation; being the same as that numbered as Case 63 on page 256. The case was not, however, investigated by a medical man on behalf of the Commission.*

Death. June 6th, 1891.

Certificate of death. "Erythematous eruption 2 (*sic*) days, after vaccination; asthenia."

Certified by. Dr. S.

Source of lymph. From arm of child S., preserved in tubes since April 13th.

Vaccinifer. Stated to be healthy; vaccination normal on 15th day when child left the infirmary.

Co-vaccinees. One, re-vaccination with lymph stored in tube May 8th. Results normal.

Sub-vaccinees. None.

Course of vaccination and illness. Vaccination normal when inspected on evening of June 1st (6th day). Next day mother left infirmary. On morning of June 4th mother noticed a "small patch "of redness between the child's shoulders." She believed it was due to irritation caused by a blanket in which the child was wrapped at night. Next morning June 5th, similar patches appeared on either side of child's neck. On this day it was seen by Dr. S., who prescribed for it. Early next morning, June 6th, child died suddenly in what "appears to have been a convulsion." Mother states there was no inflammation of vaccinated arm. She did not attribute death to vaccination. Dr. G. states that the case was a difficult one, it was nothing like erysipelas, he had not "fully made up his mind as "to the precise nature of the patches upon the child," they may have been due to "constitutional causes." He did not anticipate a "speedy and fatal termination." He further states the appearance of the vaccinated arm was normal, there was no swelling of arm or in axilla. In giving the certificate he meant only that the erythema *followed* vaccination, not that it was *caused* by it. He in "no way attributes death to the vaccination."

Method of vaccination. An ordinary lancet used; bright and clean when inspected; carefully cleansed between each vaccination and used for no other purpose.
Vaccination performed in Maternity Ward.

Treatment of vesicles. Not opened or injured in any way.
Bathed once on June 2nd, with milk, no other application before or since.

Previous history. Child weak, puny, and apparently "not a thriving "child." Ophthalmia at birth. "No definite illness."

Family history. Mother unmarried, unhealthy looking, and dirty.

General surroundings. Mother very poor. Went into lodgings on leaving infirmary.

Summary of reporter's conclusion. Reporter considers from the meagre evidence as to the "erythema" that "it is difficult to decide what the "exact nature of the eruption was." He points out that the arm apparently was not affected; and that Dr. S. "frankly admits the incompleteness of his diagnosis," and his uncertainty as to the "nature of the eruption." He concludes that "death appears to have been due in "all probability to a convulsion," but there was nothing in the condition of the vaccinated arm "to suggest that "it was the cause of the convulsion, or had anything "to do with it."

[T. D. A.]

$\frac{D_7}{1}$(V). CASE CLXXI., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL VACCINATION OFFICER.

(*Report dated 5th August* 1891.)

Case of. W. R., male, aged nine months.

Vaccination. October 6th, 1890, by Mr. C., Public Vaccinator.

Death. March 13th, 1891.

Certified cause. "Pneumonia."

Certified by. Dr. D., formerly partner to Mr. C.

Source of lymph. Direct from arm of J. O'H.

Vaccinifer. "Pasty looking;" no rash; never "snuffled." Mother had one seven months child. One child died at 11 months of "teething and diarrhœa." Two other children are delicate looking and were suffering from ophthalmia tarsi. One child healthy. Parents said to be healthy. No evidence of syphilis.

Co-vaccinees. Three. Vaccination normal in all. Two had four, one only two cicatrices.

Sub-vaccinees. One or two tubes filled from W. R.'s vesicles, but no statement given as to sub-vaccinees.

Course of vaccination and illness. Arm stated by Dr. D. to have been "perfectly normal "when inspected on 8th day," and "no complaint made "as to the child's health." Mother states that during 2nd week the arm became inflamed from the shoulder to elbow and that there was considerable swelling of the arm, but none in the axilla. "The scabs came off "once or twice" and the arm was not completely healed for six weeks. The wounds were never deep and there was no discharge. A rash like measles appeared on the 9th day lasting about two days. Mother further states the child did not subsequently suffer from "any rash of "any kind," but after the arm had healed, the date is uncertain, the child had an offensive discharge from the nose and ear. It appeared to "suffer a good deal "and became very weak." Mrs. R took the child on January 27th to M. Dispensary. Its case is recorded simply as "dentition."

The child did not improve, and in February 1891 (four months after vaccination) Mrs. R. took it to Dr. D. He states it was suffering considerably from eczema, and there were scattered pustules. Child had "fallen off" considerably. He considered that "there "were elements in the case which were suggestive of "syphilis," and that this was "perhaps a case of "syphilis transmitted by vaccination." A week or ten days later when Dr. D. saw the child it was suffering from "broncho-pneumonia," from which it subsequently died.

Note.—Dr. D. states the suspicion of syphilis was suggested to his mind by "the eczema and the "general falling off of the child," but admitted they might be "due to other causes" that there was "no clear evidence of syphilis," and he adopted no "anti-syphilitic treatment." "Subsequently he re-"ferred to the discharge from the ear and nose as "possible evidence of syphilis," but "was unable to "say whether these were due to eczema or to any more "deep-seated mischief." It should be noted that Dr. D. did not refer to these discharges until recalled to his mind by Mrs. R.'s statement, he apparently therefore did not think much of them at the time. Reporter considers this fact may possibly help to reconcile the conflicting statements of Dr. D. and Mrs. R., viz., that the child was suffering from eczema, and that it never had "any kind of rash." If the eczema was chiefly limited to nose and ear Mrs. R. would probably not regard it as a rash at the same time it would be to Dr. D. the prominent feature of the case. If this opinion is correct it may be assumed the discharge from nose and ear was due to *eczema*. Mr. Y. of the M. Dispensary when he saw the child in January said there was "nothing suggestive of syphilis or he would have noted "it in his register."

Treatment of vesicles. Vesicles opened on 8th day and lymph taken in tubes. No shield used. Sleeve removed from frock. Bread poultices, "dairy milk" and vaseline applied to arm.

Method of vaccination. Cooper Rose needle used. Carefully cleansed between each vaccination, the ferrule being removed for the purpose. Clean and in good order when inspected. Nothing noticeable in condition of vaccination station.

Previous history. Child stated to have been "perfectly well" until vaccination.

Family history. Parents stated to be strong and healthy. Eight other living children. Mrs. R. had one miscarriage 11 years previously, attributable to a fall. One child delicate, others in good health.

General surroundings. Satisfactory. No known infection in house, or neighbourhood at the time.

Sanitary condition. Good.

Summary of reporter's conclusion. Reporter considers there is "no sufficient evidence "to justify the conclusion that W. R. died of syphilis "communicated by vaccination or indeed that he "suffered from syphilis at all." He points out that Dr. D.'s evidence is quite indefinite, and that Dr. Y. of the dispensary saw "nothing suggestive of syphilis" in W. R.'s case. He admits the vaccinifer was not satisfactory. The child itself and the other children being delicate. W. R.'s co-vaccinees, however, showed no irregularity in the course of their vaccination. He concludes that "the actual cause of W. R.'s death seems "clearly to have been pneumonia."

[T. D. A.]

Case CLXXII., reported to the Local Government Board by the Public Vaccinator.*

(*Report dated — August* 1891.)

G. C., female, aged five months.

April 21st, 1891, by Dr. L., Public Vaccinator, privately, in four places.

May 23rd, 1891.

"Erysipelas, 16 days; pneumonia, two days."

Dr. L., Public Vaccinator.

Direct from arm of R. L., No. 307 in register.

A "remarkably healthy child." Vaccination normal.

Nine.

In five vaccination normal. One only had a slight swelling in the axilla which quickly subsided. In four vaccination abnormal. In three of these there was excess of inflammation commencing respectively on the 8th, 10th, and 12th days after vaccination; this extended in one case from shoulder half way to elbow, in two cases it spread to the chest. One of these children suffered from an axillary abscess, one from enlarged axillary glands, one from a swelling in "left breast." All three subsequently recovered. The fourth child had a "rose "rash" (10 days after vaccination) over its body for two days otherwise vaccination was normal.

No history of injury or any unsanitary surroundings or infection could be obtained in any of these cases.

By inference none.

On 8th day when inspected Mr. B. (Dr. L.'s assistant) states arm appeared to have been rubbed or injured; there were no "heads, and the places were weeping." Mother states arm was "red and swollen" round the places on April 25th (5th day); next day redness and swelling extended to elbow. Vesicles never rose properly; by April 28th (8th day) each place was "an "open running wound." The "redness" gradually extended over the entire body (the head excepted) blisters formed which were opened. About two days before child's death the redness had "died away;" pneumonia supervened, it became comatose, and died 33 days after vaccination. Child was attended by Dr. L. for "about a fortnight," date of first attendance uncertain.

Dr. L., stated to be a careful vaccinator, both as regards selection of vaccinifer and cleanliness. Instruments bright and clean when inspected. Has always received Government grant. Vaccination station is at the school, but no illness amongst the children at the time.

No application to vesicles except under medical advice. Mother appears to have taken proper care of the arm.

Not stated.

Not stated.

Father and mother are caretakers of gentleman's house. No infectious disease notified. No erysipelas in the village at the time.

Entirely satisfactory.

Reporter states that 5 (? 4, T. D. A.) out of the 10 children vaccinated on April the 21st suffered from erysipelas or some similar inflammation. "In view of "the dates of the commencement of their illness," he is rather inclined to the belief that three if not four of them contracted infection at a later date than C. rather than that they were infected from a common source at the time of vaccination; that C. acquired her erysipelas altogether independently or rather in addition to vaccination, but how he is unable to discover, and that the other children became infected from her.

[T. D. A.]

Case CLXXIII., reported to the Local Government Board by the Registrar-General.†

(*Report dated* 11*th July* 1891.)

C. F., female, aged seven months.

July 15th, 1890, in four places, by Mr. P., Public Vaccinator.

August 7th, 1890. — *Death.*

"Vaccination 24 days; sickness and diarrhœa, 7 "days." — *Certified cause.*

Mr. P., vaccinator. — *Certified by.*

Direct from arm of A. S. — *Source of lymph.*

Youngest of six children. Clear skinned and healthy. Vaccination stated to have been normal. Cicatrices large foveated edges, "scarred or smooth in the centre." — *Vaccinifer.*

Three. — *Co-vaccinees.*

Vaccination stated to have been normal in all, but in each case healing somewhat delayed by scabs being rubbed. In two cicatrices were foveated at the edges, smooth in the centre; in one cicatrices "red, raised, and "smooth."

Note.—A child vaccinated same day with stored lymph from another source suffered from supernumerary vesicles, in course of vaccination.

None. — *Sub-vaccinees.*

Child said to be "so middling in itself" that it was not taken to be inspected on 8th day. Mr. P. inspected it at its home. No particulars as to state of child's health at this time could be obtained, but there was no diarrhœa or vomiting. — *Course of vaccination and illness.*

Vesicles appear to have duly formed and scabbed over. At this time mother applied some "sweet oil" to the arm, which, she states, "did not agree with it." Subsequently the arm inflamed from wrist to neck, the scabs came off leaving deep sores discharging offensive pus, child was taken with violent sickness (it could not retain anything) and diarrhœa, and died on August 7th.

Note.—No information could be obtained as to whether the arm was inflamed prior to the application of the oil.

Vaccinator stated to take lymph from areolated vesicles, but evidence of this in present case too contradictory to be of value. Nothing of importance noted with regard to Dr. P.'s instruments. Surgery is used as vaccination station. No known case of infectious disease attending at the time. — *Method of vaccination.*

"Sweet oil" applied by mother as stated. — *Treatment of vesicles.*

Stated to have been healthy before vaccination. — *Previous history.*

Not stated. — *Family history.*

Rooms small and crowded. No known infectious disease in the neighbourhood. Child fed on milk, bread, and biscuits. — *General surroundings.*

Satisfactory. — *Sanitary condition.*

Reporter considers from the satisfactory course of vaccination in the vaccinifer and co-vaccinees and the condition of C. F.'s vesicles on the 8th day, that her death "cannot be ascribed to the vaccination *per se* but "to something superadded," and that this "something "was probably the application of rancid (? T. D. A.) "oil." He concludes that the child's death was due to "exhaustion, consequent upon inflammation, compli- "cated with diarrhœa and vomiting." — *Summary of reporter's conclusion.*

Reporter draws attention to the fact that the appearance of the cicatrices generally was "not satisfactory" as they mostly presented "scarred or smooth centres." He suggests this may be due to "taking lymph from "vesicles too far advanced," to the condition of Public Vaccinator's instruments (though of this there is no evidence), or to the vesicles becoming injured by being rubbed.

[T. D. A.]

Case CLXXIV., reported to the Local Government Board by the Local Registrar.* — Ac/1(2).

(*Report dated 7th July* 1891.)

E. A. D., female, aged five months. — *Case of.*

March 31st, 1891, by Dr. W., privately, in two places. — *Vaccination.*

April 30th, 1891. — *Death.*

"Post-vaccinal papular eruption; bronchitis and "convulsions." — *Certified cause.*

Mr. M. — *Certified by.*

* *This case is also amongst those brought to the notice of the Commission with a view to their investigation; being the same as that numbered as Case 57 on page 235. The case was not, however, investigated by a medical man on behalf of the Commission.*

† *This case is also amongst those brought to the notice of the Commission with a view to their investigation; being the same as that numbered as Case 63 on page 256. The case was not, however, investigated by a medical man on behalf of the Commission.*

* *This case is also amongst those brought to the notice of the Commission with a view to their investigation; being the same as that numbered as Case 51 on page 252. The case was not, however, investigated by a medical man on behalf of the Commission.*

Source of lymph. Calf-lymph on points; from N. V. E.; calf 2,416.

Co-vaccinees. Lymph from same calf supplied to seven other practitioners, six had reported their vaccinations normal.

Sub-vaccinees. None. Vesicles not opened.

Course of vaccination and illness. On 8th day, when inspected, Dr. W. states arm looked healthy. Areola slight.

Mrs. D. states that the day after inspection the child was dull and cross; that evening the arm was "red "and inflamed" from shoulder nearly to elbow. Vesicles did not burst. April 8th (10th day), arm was "much "swollen," and there was "redness" about the anus. During the next week the redness and swelling appears to have subsided, but a swelling appeared in the axilla. The child was at this time also suffering from bronchitis, which it had had previous to vaccination. About a week (? fortnight) before death mother states "a rash "came out," the anus continued red, and sores appeared on buttocks and knees. The bronchitis became worse, and child died April 30th.

Dr. M., who attended the child shortly before death, states he considered the eruption "an aggravated form "of normal post-vaccinal eruption" and not specific. The sores he believed were "simple erosion" due to constant movement of the child's legs.

Method of vaccination. Ordinary sewing needle used, lymph rubbed in from moistened ivory point. These points were, apparently, not carefully kept, one being found by reporter in the inkstand. Dr. W. vaccinates in the surgery of the Homœopathic Hospital; many cases of infectious disease were attending the hospital at this time. Dr. W. had visited an erysipelas case the morning he vaccinated E. A. D., and had subsequently been attending erysipelas. On two occasions during its illness mother took child to Dr. W.'s surgery.

Treatment of vesicles. After vaccination Dr. W. bandaged the arm with lint and bandage taken from his pocket. Next day mother removed the bandage, which stuck, and a little bleeding was caused. Subsequently mother dressed the arm for several days with cream. When it became inflamed, mother dressed it with vaseline.

Previous history. Child "caught bronchitis soon after birth" and was "never really strong again afterwards." At time of vaccination Dr. W. thought her sufficiently recovered to undergo the operation.

Family history. Stated to be good, but six out of eight children had died, one of whooping cough, four had had "snuffles." No other evidence of syphilis.

General surroundings. Satisfactory. No known illness of any kind in the neighbourhood.

Sanitary condition. Satisfactory.

Summary of reporter's conclusion. Reporter concludes the evidence gives no cause for suspecting the lymph to have been at fault. He considers death to be due "to irritation and possibly to "septic infection of the arm after vaccination in a child "enfeebled by previous and concurrent bronchitis."

[T. D. A.]

Ac/2(1). CASE CLXXV., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.*

(*Report dated 29th June* 1891.)

Case of. L. S. D., female, aged four months.

Vaccination. May 4th, 1891, by Dr. R., Public Vaccinator, in four places.

Death. May 22nd, 1891.

Certified cause. "Vaccination; erysipelas, 13 days."

Certified by. Mr. J. M.

Source of lymph. Direct from the arm of child H., No. 96 in register.

Vaccinifer. A healthy child in whom vaccination was normal. He had in turn been vaccinated from J. H., No. 78, a healthy child, with normal vaccination.

Co-vaccinees. Nineteen. *In thirteen* of these vaccination was successful, its course normal, the marks good, and the child healthy.

Five could not be traced.

One had died of bronchitis.

Sub-vaccinees. None. Child not taken for inspection owing to its illness. Its vaccination was nevertheless certified as successful.

On 5th day child noticed to be sleepy, on the 6th day it had three fits.

On the 6th (or 7th) day the erysipelas involved upper part of vaccinated arm and left side of chest, eventually spreading all over body. The vesicles did not ulcerate or slough "but rather appeared to abort."

Not satisfactory, want of care shown in cleansing instruments, and in examining children.

"Dilute mercury ointment" applied to vesicles on 6th day, under medical advice.

Good.

A month before vaccination mother had measles which did not attack the baby. Two days before the vaccination father sickened with sore throat, and he remained at home from May 5th (the day after vaccination) until May 11th. The quinsy broke on May 7th, the day before the baby began to sicken.

Good.

Good.

Reporter calls attention to the following facts:—(*a*) That all the co-vaccinees who could be traced were healthy, and their vaccination had been normal, (*b*) that it would appear not unlikely that "the infant's arm "may have become infected from its father's throat "malady either indirectly by infective particles given "off with his breath, or directly with purulent material "that escaped from his mouth on the occasion of the "bursting of his quinsy."

[T. D. A.]

* *This case is also amongst those brought to the notice of the Commission with a view to their investigation; being the same as that numbered as Case 50 on page 255. The case was not, however, investigated by a medical man on behalf of the Commission.*

CASE CLXXVI., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.*

(*Report dated 13th June* 1891.)

H. F. H., male, aged eight months.

February 19th, 1891, by Dr. C., Public Vaccinator, in five places.

March 27th, 1891.

"Congenital debility, bronchitis, and exhaustion after "vaccination." Given by permission of Coroner.

From calf 2,403.

Sixty-four children were vaccinated on February 19th from calf 2,403.

Fifty-seven entered in register as normal on 8th day. In seven (including H. F. H.) vesicles were somewhat delayed, little or no areola.

None.

Child's arm said to be "all right" on day of inspection, but the vaccinia was delayed, otherwise course of vaccination apparently normal until 30th day.

On March 21st (30 days after vaccination) child was restless, and arm apparently painful. Grandmother states on the evening of March 23rd the upper part of the arm became inflamed, and that the arm, hand, leg and left side of face and trunk were all more or less swollen and hard. On March 24th child was taken to see Dr. F. He states "all the vesicles had gone into one "dry, smooth, brownish mass about the size of a five-"shilling piece level with surrounding skin," and firmly adherent; he considered this mass had "invaded the "tissues somewhat deeply." There was no sign of suppuration and no surrounding inflammation, but the whole arm was tense and "brawny." He considered the child's state hopeless.

No details given.

Arm "gently rubbed with sweet salad oil" after inflammation appeared. No shield used. No injuries to vesicles.

Child brought up by grandmother. "Puny and "delicate from birth." Not expected to live by doctor who saw it before vaccination. Vaccination postponed until child was 6½ months old.

Mother suffered from epileptic fits. Two children born previously had died, one at 16 months of bronchitis, one at 10 weeks old found "dead in bed," it had had fits since birth.

* *This case is also amongst those brought to the notice of the Commission with a view to their investigation; being the same as that numbered as Case 50 on page 252. The case was not, however, investigated by a medical man on behalf of the Commission.*

Reasonably satisfactory. No known illness in the neighbourhood at the time. One case only of diphtheria, apparently imported, half a mile distant, occurred March 6th. No known communication of any kind between the houses.

Nothing of importance noted.

Reporter gives no conclusion. Dr. F. who saw the child stated his belief "that the child had undoubtedly "died from the effects of vaccination."

[T. D. A.]

CASE CLXXVII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE REGISTRAR-GENERAL.*

(*Report dated 26th June* 1891.)

R. J. G. M., male, aged two months.

August 7th, 1890, by Dr. E., Public Vaccinator, in four places.

August 20th, 1890.

"Vaccination, 11 days; convulsions."

Mr. J.

Direct from arm of M. P.

Child in good health. Vaccination normal. Four normal cicatrices.

Three. Vaccination normal in all.

None according to register, but one child appears to have been vaccinated from R. J. M. by Dr. E.'s assistant Vaccination in this case was normal and without complication.

Arm apparently normal on 8th day when inspected. About August 16th arm began to swell, swelling quickly extended from shoulder to wrist, and the arm became "very red": "little blisters" appeared in the neighbourhood of the vaccination pocks and the skin became of a "black colour." On August 19th child became convulsed and died August 20th.

An ordinary lancet used. Vaccinator experienced and has received the grant. Vaccination performed in surgery, a clean airy room. No known case of infectious disease on days R. J. G. M. was vaccinated or inspected.

Vesicles opened.
Mother applied cold cream to the wounds.

Not stated.

Not stated.

Details of child's home unimportant to the inquiry. Six cases of scarlet fever occurred in same road (one infected house two doors from Mrs. M.'s) in weeks ending August 5th and 12th. Actual intervisiting of families denied, but "abundant evidence of free com- "munication" . . . in and about the road in which all lived, the families being well acquainted.

Above the average.

Reporter concludes that "vaccination may be ac- "quitted of any but an indirect share" in causing R. J. G. M.'s death. He considers the erysipelas is probably referable to infection from some of the scarlet fever cases which occurred in the neighbourhood at the time, and that the opened vaccination vesicles rendered child "more readily receptive of poisonous "material."

[T. D. A.]

CASE CLXXVIII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE REGISTRAR-GENERAL.†

(*Report dated 26th June* 1891.)

B. E. A., male, aged five months.

December 3rd, 1890, by Mr. J., Public Vaccinator, in four places.

December 20th, 1890.

"Vaccinia; erysipelas."

Mr. M. L.

Direct from arm of M. P.

Vaccination normal; four normal cicatrices. *Vaccinifer.*

Four. In three vaccination was normal, one having *two* and one *three* normal cicatrices; the third child had since died of "teething complicated with bronchitis." The fourth child could not be found. *Co-vaccinees.*

None. *Sub-vaccinees.*

Nothing abnormal noticed in vesicles or arm when inspected on 8th day, but mother states that arm was "middling red." On 13th day after vaccination the arm was hard and inflamed round pocks. The inflammation subsequently extended to shoulder, wrist, chest, and back, and bullæ appeared on the arm. The child became convulsed and died exhausted December 20th. *Course of vaccination and illness.*

Ordinary lancet used. Clean and well kept when inspected. Vaccinator stated to be "careful and con- "scientious," and has received the grant. No known case of infectious disease had attended at the vaccination station. *Method of vaccination.*

Vesicles not opened, but mother cannot state whether or not they may have been rubbed; no applications at any time made to the arm. *Treatment of vesicles.*

Child always "somewhat delicate." *Previous history.*

One child stated to have died of "fits." *Family history.*

House dirty, no other defects specially noted. No known infectious illness in immediate neighbourhood. Cases of scarlet fever notified about quarter and a half-mile distant, but no connection could be traced. *General surroundings.*

In many ways unsatisfactory, but stated not to be "below the average." *Sanitary condition.*

Reporter concludes from the regular course of vaccination in the vaccinifer and co-vaccinees, and in the subject of this report until the 11th day that neither the operation nor the lymph are responsible for the fatal result. He is unable to say to what cause the erysipelas was due unless to the dirty condition of the house in which the child lived. *Summary reporter's conclusion.*

He draws attention to the fact that B. E. A.'s mother appeared "unusually deficient in intelligence "and cleanliness."

[T. D. A.]

CASE CLXXIX., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.* **Ac 1 & 2 (3)**

(*Report dated 3rd June* 1891.)

D. C., male, aged eight months. *Case of.*

February 9th, 1891, in four places, whether by Mr. McN., Public Vaccinator, or his assistant, Dr. D., uncertain. *Vaccination.*

April 11th, 1891. *Death.*

"Vaccination; diffuse cellulitis and pneumonia." *Certified cause.*

Mr. S. *Certified by.*

Direct from arm of No. 460 in register. *Source of lymph.*

"No evidence of noticeable irregularity" could be traced. Two vesicles coalesced; they were believed to be too near together. *Vaccinifer.*

Three.—Vaccination in all of them is stated to have been normal. *Co-vaccinees.*

Reporter has investigated the cases of 52 other children, vaccinated respectively January 19th, 26th, February 2nd, 9th, 16th; in 48 or 49 of these all insertions were successful and the scars good. In ten cases one or more vesicles are stated to have burst, but many of these were believed to have been rubbed. In 16 cases there is stated to have been some early inflammation in four of these, and two others considerable inflammation during 2nd week. In four cases axillary swelling, one resulting in abscess, the vesicles in this case being treated with scented hair oil. Seven children suffered from various ailments during vaccination, which appear to be attributable, if at all, to vaccination only in a remote degree. Twelve, more probably 17 cases, appear to have been normal; four were not seen.

None. *Sub-vaccinees.*

Child not brought for inspection on 8th day; mother states vesicles had *not* burst, but one pock inflamed by *Course of vaccination and illness.*

* *This case is also amongst those brought to the notice of the Commission with a view to their investigation; being the same as that numbered as Case 62 on page 256. The case was not, however, investigated by a medical man on behalf of the Commission.*

† *This case is also amongst those brought to the notice of the Commission with a view to their investigation; being the same as that numbered as Case 60 on page 254. The case was not, however, investigated by a medical man on behalf of the Commission.*

* *This case is also amongst those brought to the notice of the Commission with a view to their investigation; being the same as that numbered as Case 49 on page 252. The case was not, however investigated by a medical man on behalf of the Commission.*

3rd day, and by 8th day inflammation extended to shoulder, other three places not inflamed. During 2nd week all the places became scabbed over, and a week later three scabs became detached. The scab on previously inflamed place remained adherent. At end of 3rd week small swelling appeared in axilla. At this time all redness of the arm had disappeared. Some days later after poulticing, redness appeared round lump in axilla, and down side of body, but mother believes did not invade the vaccinated arm. Dr. S. who attended the child from April 2nd, states there was at this time muco-purulent discharge from beneath the one adherent scab, and an erysipelatous blush extending from this scab to shoulder and down the side of the groin. The swelling of the parts increased, but there was no extension of the area of inflammation. About April 5th pneumonia supervened, and child sank.

Dr. S. appears clear that the inflammation started from the unhealthy pock and was most intense around it; mother's statement, it will be seen, does not coincide. The axillary swelling did not burst, and was not opened and partially subsided before the child died.

Method of vaccination. Evidence negative, but much irregularity as to children not coming for inspection, entered in register as inspected, and as having been successfully vaccinated; also as to vaccinator, Mr. McN., initialling cases vaccinated by his assistant. Exposure of vaccinator to scarlet fever or septic infection uncertain.

Treatment of vesicles. No application to vesicles. No shield used. Arm not rubbed.

Previous history. Child stated always to have been delicate, and vaccination postponed in consequence. When six weeks old it suffered from "sickness and weakness" said to be due to overfeeding.

Family history. Parents stated to be healthy.

General surroundings. House dirty and untidy. Child's father and grandfather both drink. Scarlet fever prevalent in the neighbourhood at the time, but no known intercourse with affected households. Five out of 20 cases of erysipelas notified since October, occurred in February.

Sanitary condition. An ash-pit privy a few yards from house stated to be at times full and offensive. This was emptied during child's illness, other details unimportant.

Summary of reporter's conclusion. Reporter concludes that in this case "erysipelas was "accidentally engrafted on to vaccinia," but how this occurred he is unable to say. He draws attention to the fact that in the 51 cases investigated, there was considerable though not serious "irregularity of "vaccinia." He considers that in certain cases unsuitable vaccinifers were chosen, but there is no evidence to show that this was the case in the subject of this report.

[T. D. A.]

$\frac{Ac}{z}$(2. V ?) CASE CLXXX., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE REGISTRAR-GENERAL.*

(*Report dated 30th July* 1891.)

Case of. P. K., male, aged three months.

Vaccination. October 6th, 1890, by Mr. F., Public Vaccinator, in four places.

Death. October 30th, 1890; according to mother October 31st.

Certified cause. "Erysipelas following vaccination."

Certified by. Mr. F., Public Vaccinator.

Source of lymph. Stored in tubes from arm of child W. B., No. 127 in register, vaccinated April 21st, 1890.

Vaccinifer. "Clean-skinned" healthy child; four good cicatrices.

Co-vaccinees. Two. Vaccination in both stated to have been normal.

Note.—One child vaccinated from another source on same day, is stated to have suffered from some inflammation of arm subsequent to vesicles being opened.

Sub-vaccinees. None according to register, but Mrs. K. states that one child was vaccinated from P. K.; this, however, appears unlikely.

Course of vaccination and illness. "Not much redness" on day of inspection. Next day arm began to inflame. Subsequently the inflammation spread to "arm, body, and legs," diarrhœa supervened, and child died October 30th or 31st.

Method of vaccination. "Rotatory needles" used. Instruments in good order when inspected. Care said to be used in selection of vaccinifers. Lymph collected in tubes properly sealed and numbered. No evidence of infectious disease at the surgery.

Treatment of vesicles. Vesicles not rubbed. Evidence as to whether opened or not doubtful. Arm when inflamed dressed with raw cream. No shield used.

Previous history. Stated to have been healthy before vaccination. 7th child.

Family history. Mrs. K. suffered from erysipelas, commencing November 11th, 11 days after her child P. K.'s death, and five after its burial.

General surroundings. Father keeps small public-house. Nothing else of importance noted. No known case of infection at the house.

Sanitary condition. Surroundings of house dirty and insanitary. Yard soaked with decomposing slop water. Privy often offensive. Well so polluted as to be unfit for use.

Summary of reporter's conclusion. Reporter concludes he "found nothing to impugn the "quality of the lymph," nor manner of vaccination; he considers that the probable origin of the inflammation was the "polluted air within and without the "dwelling caused by the insanitary conditions, the "vaccinated arm affording a point for attack."

He notes that vaccination in the other children vaccinated at the same time pursued a normal course.

[T. D. A.]

D. CASE CLXXXI., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE REGISTRAR-GENERAL.*

(*Report dated 15th August* 1891.)

N. B. M. S., female, aged seven months.

December 3rd, 1890, privately at surgery, by Dr. E., in two places.

May 18th, 1891.

"Vaccination, 4½ months; blood-poisoning, four days "afterwards; convulsions, one hour."

Mr. J. L. T.

Note.—Mr. J. L. T. saw the child for the first time three or four days before death, and he signed the certificate solely on the statement made by the mother. By blood poisoning he meant not "pyæmia," but some general infection. The conclusion he came to was "that vaccination had evoked dormant scrofula, or "perhaps syphilis."

Calf lymph from Dr. Renner, supplied through Messrs. Ferris.

One of two calves, both of whom are reported to have been healthy.

One with same tube of lymph. Vaccination normal.

Twenty-one doctors were supplied with lymph from same two calves; 20 of these replied to inquiries:—

Seventeen had had entirely successful results.

Two reported measly rashes.

One replied that the lymph had been inert.

Four children besides the above were vaccinated in C. with the same lymph as N. B. M. S. In two of these, vaccination was normal. One could not be found, and one had died from "natural causes."

No case of abnormal vaccination from same batch of lymph reported to Dr. Renner.

None. Vesicles not opened.

According to mother there was nothing irregular about vaccination except that the two vesicles seemed smaller than usual. The pocks "did not heal slowly." No ulcers or sores formed round them. According to Dr. E., who saw the child about a month after vaccination the pocks had healed well, leaving two normal scars; there had been no excessive areola, erythema, or erysipelas. The father and mother "are stated to have "acknowledged that the arm was perfectly healed "before the child was taken to a doctor," but they considered that the vaccination had "acted inwardly."

Mother states that about five days after vaccination the cervical glands on the left side became enlarged; a month afterwards the child was seen by Dr. E., who found enlarged cervical glands, eczema of the face, scalp and neck, left otitis and otorrhœa. This continued

* *This case is also amongst those brought to the notice of the Commission with a view to their investigation; being the same as that numbered as Case 61 on page 256. The case was not, however, investigated by a medical man on behalf of the Commission.*

* *This case is also amongst those brought to the notice of the Commission with a view to their investigation; being the same as that numbered as Case 53 on page 253. The case was not, however, investigated by a medical man on behalf of the Commission.*

until the child was transferred to the care of Mr. J. L. T. three or four days before its death. He states that there was then an abscess at the angle of the jaw, and that the axillary glands were enlarged; that there were bullæ "like small pemphigus" dotted over trunk, limbs, and scalp, mingled in the last-named place with eczema, they "reminded him somewhat of syphilis." The vaccination wounds had healed, but there were cicatrices near them looking like the scars of "serpi- "ginous ulceration."

Exhaustion, emaciation, and hæmorrhage from the bowels, and finally convulsions supervened.

Believed to be satisfactory.

By inference none.

Child suffered from eczema of scalp previous to vaccination according to Dr. E. who treated her. Mother denies this, but the notes in her dispensary book had been removed and were said to be lost.

Mother suffered from puerperal mania after child's birth. She is a pale, delicate, strumous-looking woman, who "had suffered apparently from glandular affection "of the neck." Father not robust. Three children living and healthy. One died at 10 months of "ulce- "ration of the stomach."

Satisfactory.

Reporter concludes that Mr. J. L. T. had slender grounds for giving the certificate of death, and that the normal process of vaccination shows that "the "operation of vaccination could have had no active "share in setting up the fatal mischief." He is of opinion that there is strong evidence that the case was one of early and probably inherited struma.

[T. D. A.]

CASE CLXXXII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.*

(*Report dated* 15*th August* 1891.)

S. J. L., female, aged five months.

February 25th, 1891, by Dr. H., Public Vaccinator, in three places.

April 5th 1891.

"Erysipelas following vaccination."

Dr. H. V.

Direct from arm of child M.

"Looked rather delicate." Vaccination was normal, but it died of "bronchitis and congestion of the lungs," on June 13th, 1891, four months after vaccination.

Eight. One died of "lung disease" on May 15th; the healing of the vaccination pocks somewhat delayed, otherwise vaccination "had not been unsatisfactory." One could not be found. In the remaining six vaccination was without complication.

Doubtful. Mother of S. L. says that tubes were filled. Dr. H. "has no record of this."

Normal up to eighth day. Two of the pocks healed well. The tissues around the third became inflamed during third or fourth week. The arm subsequently swelled, and the inflammation spread over trunk and extremities, accompanied by vomiting and high temperature. Convulsions commenced on the 39th day, and death resulted next day.

The vaccination scars had healed.

A Hilliard's vaccinator used. "Clean and well kept" when seen.

Not stated.

Not stated.

Not stated.

No known contact with infectious disease, though whooping cough was very prevalent.

Unfavourable. Home in an unsavoury street in the Irish quarter. The back yard of the house "reeked "with refuse," the sink and privy in bad order.

Reporter is of opinion "that it is clear that inasmuch "as the illness of the child L. did not begin until a "month after vaccination (Note *a*) neither the vacci- "nation *per se* nor the lymph employed can be reason- "ably accused of any share in causing the illness," and "that it is rather to be inferred that the morbific "matter was implanted into the arm as it was healing." (Note *b*) though there is, in his opinion, no evidence to show whether this extraneous cause was some infectious illness (*e.g.*, whooping cough) or the child's unwholesome surroundings.

Note a.—According to Dr. V.'s statement, he first saw the child on March 25th, when it had been "ill one "or two days." The mother said, however, that the arm became red and angry a week or 10 days after inspection.

Note b.—The inflammation started from a vesicle in which healing was delayed, and which was discharging slightly when Dr. V. first saw the case 4½ weeks after vaccination.

[T. D. A.]

* *This case is also amongst those brought to the notice of the Commission with a view to their investigation; being the same as that numbered as Case 56 on page 251. The case was not, however, investigated by a medical man on behalf of the Commission.*

CASE CLXXXIII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE CORONER. **O4/2**

(*Report dated* 25*th August* 1891.)

Case of. A. D., male, aged seven months.

Vaccination. July 28th, 1891, by Dr. G., Public Vaccinator. Twice postponed.

Death. August 16th, 1891.

Inquest. August 21st, 1891.

Verdict of jury. "That the child A. D. did die from syncope from "formation of a clot in the heart when suffering from "inanition and diarrhœa; natural causes." The Coroner stated that he should represent the state of the premises to the C. vestry.

Source of lymph. Direct from arm of E. D. Vaccination normal; scabs knocked off.

Vaccinifer. By inference healthy, one or two spots of impetigo on occiput subsequent to vaccination.

Co-vaccinees. Two, on July 28th, direct arm to arm, and two with lymph stored in tubes on August 4th.

In the former cases vaccination was normal, though in one of them two scabs were knocked off; in the latter only two pocks formed in one case, and one in the other. All the children were well when inspected.

Sub-vaccinees. None. Vesicles not opened.

Course of vaccination and illness. Three vesicles only formed at four points of insertion. There is said to have been some redness round pocks on third day, and some "running" from them, subsequently vaccination seems to have been normal, though two of the scabs were knocked off. The child began to take food badly and directly after vaccination; 29 days afterwards it suffered from vomiting and next day from diarrhœa; on the same evening it was thought to have a fit; next morning it died.

A post-mortem examination was held, but threw no additional light on the cause of the child's death.

Method of vaccination. Satisfactory, though register was not accurately kept.

Treatment of vesicles. None. Apparently none was required.

Previous history. Not good. Vaccination had been twice postponed—once on May 5th for 14 days, and again on July (?) 21st for a month. The ground for postponement seems to have been "intertrigo." The child had had a crack behind the ear, and often vomited after being suckled.

Family history. Another child in same family aged two years suffered from diarrhœa at same time as A. D.; two other children died in infancy before vaccination.

General surroundings. Filthy.

Sanitary condition. *Very* bad. The parents occupy three rooms in a loft over a stable, one of which only is inhabited, it is dirty, cramped, and dilapidated, the floor being in holes, communicating with the stable below, w.c. dark, unventilated, and filthy; dung heap, serving as receptacle for slops, immediately below window. Whole premises unfit for human habitation, and conditions likely to cause diarrhœa.

Summary of reporter's conclusion. Reporter concludes that the child's death was due to diarrhœa, and sees no evidence from the history of the child's illness or from the post-mortem appearances that vaccination could have had any "but a very remote "and subordinate share in the causation of the child's "illness."

[T. D. A.]

E/0 (V).

CASE CLXXXIV., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.*

(*Report dated 24th August* 1891.)

Case of. J. L., male, aged seven weeks.

Vaccination. (*a.*, May 7th ?) *b.*, May 14th, 1891, by Dr. H., Public Vaccinator.

Death. May 23rd, 1891.

Certified cause. Certified by. "Vaccinia, nine days; measles." Dr. McD.

Source of lymph. Vaccinifer. Direct from arm of child, E. B. A healthy child. Vaccination normal.

Co-vaccinees. Two, in whom vaccination was without any complication.

Sub-vaccinees. One. Vaccination normal. This child did not suffer from measles after being vaccinated from J. L.

Course of vaccination and illness. The mother states that her child J. L. was unsuccessfully vaccinated on May 7th; there is no record of this in the register. Vaccination is believed to have been normal. The vesicles formed well, were not injured, and did not on the 9th day show an undue amount of areola.

On the 9th day Dr. McD. found a well-marked eruption of measles out all over the child's body, its temperature was 105.° It had no bronchitis, pneumonia or diarrhœa. During the night its respiration became difficult, and it died on the morning of the 10th day.

Method of vaccination. Cooper Rose's needles used, which when seen were in an unsatisfactory condition. Register not accurately kept.

Treatment of vesicles. None. Vesicles believed not to have been injured in any way.

Previous history. Family history. Not stated. Not stated.

General surroundings. A case of measles next door but one. One of Mrs. L.'s children constantly in and out of the house. Mother also stated to have gone in. A case subsequently occurred next door but two. Mr. H. (the vaccinator) states in a letter that the mother was said to have kept the child J. L. out as late as 11 o'clock at night, and then brought it in wet through; he does not, however, state when this occurred, or that the facts are within his own knowledge.

Summary of reporter's conclusion. Reporter is of opinion that there is nothing to throw suspicion on vaccination "as having been concerned in "the child's death," which he regards as having been due to measles complicated with broncho-pneumonia.

Note.—With regard to nature of the eruption it may be observed that it appeared on the 9th day after vaccination, a date at which vaccinal eruptions are common, that it is expressly stated that there was no bronchitis or pneumonia on the day when the rash appeared, and that there is no mention of the child having sickened three or four days previously to the appearance of the eruption as might have been anticipated if the case had been one of measles.

[T. D. A.]

Ac/1 (2).

CASE CLXXXV., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE REGISTRAR-GENERAL.†

(*Report dated 7th September* 1891.)

Case of. V. G., female, aged four months.

Vaccination. By Dr. T., privately. No record, but probably about November 15th.

Death. December 19th, 1890.

Certified cause. Certified by. "Erysipelas, one month; vaccination, 35 days." Dr. T.

Source of lymph. Co-vaccinees. Not known. V. G. was one of twins, both vaccinated at same time and place. The other child was isolated by Dr. T.'s directions when erysipelas appeared in V. G., and is stated to have done well. Family had removed from neighbourhood and could not be found.

Sub-vaccinees. Not stated. No record.

Dr. T. cannot recollect whether the child was inspected on 8th day, nor condition of vesicles at that time and whether inflamed or not. He states that "the erysipelas "began on the vaccinated arm about a week after "vaccination," subsequently spreading over the trunk and extremities, that he "observed no axillary swelling," and "remembers nothing irregular about the vaccina- "tion vesicles," which he "believes scabbed over in "the natural manner."

Course of vaccinal and illness.

Dr. T. had no notes of the case.

Vaccinator keeps no one instrument for vaccination, and could not say with what instrument it had been performed. He states that he keeps them in good order, and is careful to cleanse and disinfect them.

Method of vaccinal

Those seen were in good condition. Vaccinator was not aware that he had been in contact with any septic infection, but on November 3rd and 5th Dr. T. stated he had noted cases of scarlet fever.

A few cases of diphtheria and scarlet fever stated to have occurred in the neighbourhood in October and November. No unusual prevalence of erysipelas.

General surroundings.

Note.—No details as to treatment of vesicles; previous history, &c., &c., could not be ascertained, as the family had left the neighbourhood.

Reporter refers to the vaccination not being performed with an instrument kept exclusively for the purpose as "a circumstance which may naturally give rise to some "suspicion," but he concludes that "assuming Dr. T.'s "account to be substantially accurate it would seem "more probable that the erysipelas of V. G. was an "accidental infection *after* the operation of vaccination, "and not due to any cause special to the vaccination "itself." This opinion he considers is supported by "the comparatively late appearance of the erysipelas "(according to Dr. T.'s account. . . .) and the "alleged freedom of the other child from irregularity "of any kind."

Summa of reporte conclus

He points to the cases of diphtheria and scarlet fever which had occurred as showing that "sources of infection must have been present in the neighbourhood."

[T. D. A.]

O1/0 (

CASE CLXXXVI., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.*

(*Report dated 18th September* 1891.)

Case of

F. A. E., aged four months.

Vaccination. Death.

May 11th, 1891, by Mr. B., privately, in three places. May 21st, 1891.

Certif cause. Certifi

"Morbus cordis; vaccinia; pneumonia." Mr. P.

Source lymph.

"Direct from arm of healthy-looking child," name not stated.

Co-vac cinees.

Not stated.

Sub-vac cinees.

None.

Course vaccina and ill

Mother stated that two days after vaccination child seemed unwell, shortly afterwards it was attacked with vomiting, fever, shortness of breath and cough. On May 15th, Mr. P. saw and prescribed for the child, but it did not improve. Notwithstanding its illness, the child was taken for inspection on 8th day. There was no redness about the pocks, nor was there at any time any inflammation swelling or tenderness. There was no axillary swelling.

On May 20th the child's "chest symptoms continu- "ing," she was taken again to Mr. P. The following day convulsions supervened and the child died.

Metho vaccin Treatm of ves

An ordinary lancet used.

One vesicle pricked on 8th day, but no lymph taken.

Previ histor

Child stated to have been healthy at birth, but six weeks later it was found to have heart disease. Much improved in health before vaccination.

Famil histor

Stated to be good. Mother taken ill with "epidemic "influenza, bronchitis, and inflammation of lungs" two days before child's death. The only other child had "suffered greatly from bronchitis" as a baby.

Gener surrou ings.

A lodger in the same house had suffered from influenza a week or so previously. Nothing else of importance noted.

Sanita condit

Not stated.

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* *This case is also amongst those brought to the notice of the Commission with a view to their investigation; being the same as that numbered as Case 56 on page 255. The case was not, however, investigated by a medical man on behalf of the Commission.*

† *This case is also amongst those brought to the notice of the Commission with a view to their investigation; being the same as that numbered as Case 78 on page 262. The case was not, however, investigated by a medical man on behalf of the Commission.*

* *This case is also amongst those brought to the notice of the Commission with a view to their investigation; being the same as that numbered as Case 65 on page 255. The case was not, however, investigated by a medical man on behalf of the Commission.*

Reporter concludes "that F. A. E.'s death was in no "way connected with vaccination which was running "a normal course up to the time of death." He points out that "two days is an average incubation period of "influenza," and that the child was attacked two days after its first visit to Dr. B.'s surgery, where as influenza was "rife in the locality," it may probably have become infected, or that it may have contracted the disease from the former case which occurred in its home.

[T. D. A.]

CASE CLXXXVII. INQUIRY INSTITUTED BY THE LOCAL GOVERNMENT BOARD IN CONSEQUENCE OF PARAGRAPH IN "LANCET."

(*Report dated 18th September* 1891.)

A. E. B., male, aged 19 years.

September 20th, 1890, by Mr. C. F. W., in four places.

June 24th, 1891.

"Cerebral tumour; epileptic convulsions."

Mr. C. F. W.

Direct from arm of A. C., 3rd remove from calf.

Vaccination said to have been "regular." Child had died 2½ months after vaccination of "inflammation of "the heart."

Four. One only seen, in him vaccination was normal. The other three could not be traced.

None.

Without local complication of any kind. The arm healed well.

Towards end of September, 9 or 10 days after vaccination, A. B. first suffered from headache and vomiting.

October 12th.—Vomiting and headache worse; *first* consulted doctor.

November 11th.—Obliged to leave work entirely.

November 12th.—Double convergent strabismus.

November 25th.—Drowsiness; depression; tenderness of scalp; spasm of right arm.

November 30th.—Diplopia.

February 3rd–March 3rd.—In-patient in Guy's Hospital, suffering from cerebral tumour and optic atrophy. Subsequently total blindness and deafness supervened, epileptic seizures became frequent, and death resulted about nine months after first onset of illness. No post-mortem examination was permitted.

Mr. W., who attended the case and who has supplied full notes, looked upon it as one of "*cerebellar* "tumour."

Careful.

None.

Said by mother to have been a "steady, well-con- "ducted lad," and always healthy. When in Guy's Hospital mother is said to have raised the question as to whether his symptoms were due to ill-treatment, as someone was said to have knocked him about. No history of syphilis.

Maternal grandfather died of "galloping consump- "tion."

"From the clinical evidence as well as from the "collateral lymph history," reporter considers it to be "quite certain that A. E. B. died of natural causes "altogether unconnected with the re-vaccination he "had undergone nine months previously."

[T. D. A.]

CASE CLXXXVIII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE REGISTRAR-GENERAL.*

(*Report dated 19th September* 1891.)

L. A. C., female, aged four months.

June 10th, 1890, by Public Vaccinator, in four places.

June 25th, 1890.

"Blood poisoning one week, subsequent to vaccina- "tion."

Not stated.

Direct from the arm of a child.

A strong healthy child. Vaccination normal.

Four, in whom vaccination was normal.

None. Vesicles punctured but no lymph taken.

Vaccination normal till 6th day, slight redness then first noticed. On 8th day some redness and swelling round vesicles. During the second week the swelling extended from shoulder to elbow, and the four vesicles coalesced forming one sore. No information as to the amount and nature of the discharge obtainable. The inflammation did not spread, but the child died on the 16th day. No details of its illness are given.

Satisfactory. Instruments in good order when seen. A school-room used as vaccination station, which was clean when visited.

Fresh cream applied by mother during the second week. On the 14th day the arm was poulticed under medical advice.

According to mother a small but healthy child.

Good.

Mother lived in a small two-roomed house, dark, damp, dirty, and ill-ventilated, with an irregular badly paved stone floor.

Not satisfactory, but no grave defects noted. During the course of vaccination the child was frequently taken to a neighbour whose child was notified as suffering from measles on June 4th.

Reporter found it impossible, owing to the lapse of time (14 months) since the operation, to obtain full details as to this case, he found nothing to justify him in attaching blame to the lymph or the vaccinator. He calls attention to the application of cream to the vesicles, and to the child's having been exposed to the contagion of measles, both of which he considers may have been factors in the ultimate result, and that the cause which decided the onset of the "erysipelas" was the insanitary and filthy state of the house in which she resided.

[T. D. A.]

CASE CLXXXIX., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE PUBLIC VACCINATOR.* **AAc 1 & 2**(i).

(*Report dated 8th September* 1891.)

H. B., male, aged four months.

February 24th, 1891, by Mr. W. S., Public Vaccinator, in three places.

March 23rd, 1891.

"Erysipelas, 10 days; vaccination, 14 days."

Mr. W. S.

Dr. R.'s calf (No. 2,557). Six tubes were supplied by Messrs. R. and B. on February 23rd. About three only of these were used, three having after the lapse of some weeks become cloudy, were destroyed.

Total number not stated, doubtful whether H. B. was vaccinated from same tube of lymph as another child, or with a fresh one. With the three tubes mentioned above, seven children including H. B. were vaccinated. In five of these vaccination was normal. One died three months afterwards of bronchitis, vaccination had been normal and the pocks healed several weeks before death. In one case "spots" appeared in the neighbourhood of the pocks, and "angry sores" formed which remained open about 10 weeks. The eruption spread over part of the arm and to head, it was said to be eczema by the doctor who attended it. In six sub-vaccinees of the above children vaccination was without complication.

None.

The dates given by mother and doctor differ considerably, and there is no means of reconciling them. Neither can be depended on. According to mother nothing unusual was visible until the 5th day, when she says the arm became red and swollen, so that on the 6th day she took the child to Mr. S. He, however, has no record of having seen the child before the 8th day, the day of inspection, when he found a blush of unusual extent round the pocks and prescribed for it. The mother denies that it was taken to Mr. S. on this

Source of lymph.
Vaccinifer.
Co-vaccinees.
Sub-vaccinees.
Course of vaccination and illness.
Method of vaccination.
Treatment of vesicles.
Previous history.
Family history.
General surroundings.
Sanitary condition.
Summary of reporter's conclusion.
Case of.
Vaccination.
Death.
Certified cause.
Certified by.
Source of lymph.
Co-vaccinees.
Sub-vaccinees.
Course of vaccination and illness.

* *This case is also amongst those brought to the notice of the Commission with a view to their investigation; being the same as that numbered as Case 79 on page 262. The case was not, however, investigated by a medical man on behalf of the Commission.*

* *This case is also amongst those brought to the notice of the Commission with a view to their investigation; being the same as that numbered as Case 44 on page 251. The case was not, however, investigated by a medical man on behalf of the Commission.*

day at all. It seems clear that inflammation commenced round the pocks during the latter part of the first week and spread to trunk and extremities during the third week; that the vesicles ruptured during the second week, leaving open sores. A swelling formed on scrotum, and broke and discharged a clear fluid resembling water during the 3rd week.

Method of vaccination. Operation believed to have been carefully done in Mr. S.'s surgery. Mr. S. attended a case of erysipelas same day, time not known, but he had also seen it the day before, and saw it on the 3rd, 4th, and irregularly up to the 8th day (March 2nd).

Treatment of vesicles. Houseleek and cream applied by mother on morning of 5th day, and in evening of same day a bread poultice; the next day, the swelling and redness being more intense, the child was put under the care of Mr. S., who treated it with lead lotion and afterwards with tincture of iron.

Previous history. Good.

Family history. Unimportant.

General surroundings. Unfavourable. Child's home a public-house frequented by bargees. Child nursed in tap-room and bagatelle room, which were dirty, but there was no known exposure to infectious disease.

Sanitary condition. Very bad. A catchpit filled with semi-liquid filth at back of house overflowing into a "large sheet of "black and stinking matter" 18 feet from the house. The open privy midden within 6 feet of the pump from which part of the drinking water is taken. Washing water for the child obtained from an uncovered rain-water cistern.

Summary of reporter's conclusion. Reporter is of opinion "that the erysipelatous in- "flammation which followed vaccination in this case "cannot be attributed to the lymph, nor to infection "from the vaccinator, who was at the same time in "attendance on a case of erysipelas, nor to the appli- "cation of houseleek and cream, nor to the surround- "ings of the child at the time of vaccination," though he thinks there is a danger that the surgery may have become infected by some person previously in the room. He considers that the erysipelas may have had its origin in the child's home surroundings, both as regards the kind of persons who frequented the inn and the unusually bad sanitary condition of the premises.

[T. D. A.]

Ac 2 (2. V). CASE CXC., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE MEDICAL OFFICER OF HEALTH.*

(*Report dated 19th September* 1891.)

Case of. S. A. S., female, aged four months.

Vaccination. May 8th, 1891, by Mr. B., son of Public Vaccinator. This vaccination was unsuccessful, and child was apparently re-vaccinated May 15th in three places.

Death. June 17th, 1891.

Certified cause. "Erysipelas (head and neck); exhaustion."

Certified by. Mr. M.

Source of lymph. Stored lymph from child E. L., vaccinated April 30th. S. S. is stated to have been re-vaccinated May 15th from a previous co-vaccinee, M. J.

Vaccinifer. By inference both vaccinifers were healthy and vaccination normal.

Co-vaccinees. Seven of first vaccination. Vaccination normal in all. Co-vaccinees of second vaccination not stated.

Sub-vaccinees. Apparently one, but not stated in register. Vaccination successful.

Course of vaccination and illness. Dr. B. stated there was "nothing . . . . amiss" with the child when brought for inspection on 8th day after first examination. No mention is made by Dr. B. of a re-vaccination, and no evidence given as to inspection and condition of arm on 8th day after second vaccination. Mother states "a small lump appeared "under the arm" on May 14th, and broke on May 16th; that the vaccination places appeared "all right" at this time. On May 17th the slight inflammation which had previously surrounded them spread to the elbow. Poultices were ordered and the scabs became detached by removal of the poultice. Inflammation gradually spread over the extremities, head, and trunk. Child subsequently became convulsed, and had hæmorrhage from the bowels. Mrs. S.'s statements on several points do not coincide with Dr. M.'s, who attended the child; her dates were uncertain, and appear to be erroneous. Dr. M. states he attended S. S. about a fortnight after vaccination. When he first saw her there were "three "dirty-looking (suppurating) ulcers on the arm," around which the skin was tense and swollen; the axillary glands were enlarged. There was no pneumonia or convulsions.

Vaccination instruments in good condition when inspected. Colliery surgery and post office used as vaccination station.

Vesicles opened on 8th day. On 3rd day after second vaccination mother applied castor oil to the pocks. Lead lotion ordered, but not used. Pocks appeared to have been rubbed and injured. Scabs removed by poultice.

Child stated to have been healthy before vaccination.

Not stated.

House extremely damp and dirty. Fowls, after picking over the filth and refuse of the yard, come in and out of the house. Scarlet fever prevalent in neighbourhood at the time. Seven cases of erysipelas had also occurred in the district since December, one being in April and one in May, exclusive of the child S. S.

Very defective.

Reporter concludes that the late appearance of the erysipelas (about 10 days after second vaccination, according to Dr. B.) and the healthy condition of the other children vaccinated at the same time negatives the idea that the cause of infection is due to the vaccination itself or to the place in which it was performed. He considers that the child's vesicles being rubbed, and its surroundings filthy, it is not surprising that the wounds became the seat of septic infection. He further notes the presence of scarlet fever and erysipelas in the neighbourhood "as of additional importance in this "connexion."

[T. D. A.]

* *This case is also amongst those brought to the notice of the Commission with a view to their investigation; being the same as that numbered as Case 68 on page 257. The case was not, however, investigated by a medical man on behalf of the Commission.*

Ac 2 (2). CASE CXCI., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.*

(*Report dated 24th September* 1891.)

A. M. J., female, aged 3¾ months.

May 21st, 1891, by Public Vaccinator, in three places.

June 13th, 1891.

"Vaccination, 22 days; erysipelas, 13 days."

Not stated.

Direct arm to arm.

Healthy. Vaccination normal.

Six. *Four directly arm to arm*, in two of whom vaccination pursued a normal course. Two could not be traced. *Two with lymph stored in tubes;* in one of these there had been increased redness and swelling round the pocks during the 2nd week, and sores formed which did not heal for eight weeks, but left normal scars.

The child and its surroundings were dirty. No mention is made of the other case.

According to nurse two, but of this there is no record in register, and vaccinator does not recollect the fact; two of the vesicles were punctured and he thinks he may have filled some tubes.

On 8th day vesicles stated by nurse "to be smaller "than usual, and to have had slight redness round "them," on 9th day child poorly, redness increasing, on 10th day arm inflamed, and hard from shoulder to elbow. Next day the glands in axilla became enlarged, and the two pocks which had been opened were discharging, the third one remaining "intact." By the 14th day the pocks had scabbed over, and the redness had spread to the trunk, later on to the other arm, and the child died of exhaustion on the 24th day after vaccination.

Satisfactory. Instruments in good order when inspected.

According to nurse, castor oil was applied with her finger on the morning of the 10th day and cream in the

* *This case is also amongst those brought to the notice of the Commission with a view to their investigation; being the same as that numbered as Case 67 on page 257. The case was not, however, investigated by a medical man on behalf of the Commission.*

afternoon, two days later she rubbed on cold cream with a feather, on the 15th day under medical advice she dressed the inflamed part with carbolic ointment. No shield used and the pocks not irritated by the sleeve.

Said to have been good. Some intertrigo on day of vaccination.

Mother died three weeks before child was vaccinated, cause of death not stated.

Child nursed out. As far as is known she was not exposed to any infectious disease either at home or at the vaccination station.

Home clean, but "a cesspool of the filthy character " prevalent in some parts of Kent closely abutting on " the house."

Reporter is of opinion "that the facts of the case are " such as to remove any suspicion that the lymph was " of such a character as to cause the onset of the " erysipelatous inflammation," and "that the treat- " ment adopted as a preventive of any possible evil " result, and intended as a safeguard may have caused " the onset of the erysipelas."

Note.—The vaccination of only two out of six co-vaccinees is known to have been normal, two could not be found, of one there is no record, and in one there seems to have been abnormal inflammation and ulceration. The subject of this report was hand fed and out at nurse, its mother having died three weeks before its vaccination.

[T. D. A.]

CASE CXCII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.*

(*Report dated 19th September* 1891.)

W. H. H., male, aged three months.

June 11th, by Public Vaccinator, in four places.

June 28th, 1891.

"Vaccinia, 13 days; erysipelas, 4 days."

Not noted.

Direct from arm of H. K.

Condition not stated. Vaccination normal.

Six. Vaccination known to have been quite normal in one case only. One had left district and could not be found. In four there was some abnormality, but not sufficient to require medical advice.

In one, the vesicles burst on 3rd day, leaving three slowly healing sores without much surrounding inflammation. Scars normal.

In one, two vesicles coalesced during 2nd week. This child acted as vaccinifer to five others who did well. Cicatrices normal.

In one, redness and swelling from wrist to neck during 2nd week, soon subsiding. Cicatrices normal.

In one, two pocks coalesced during 2nd week. Sores not healing for five weeks. This case acted as vaccinifer to three children who did well. A shield was subsequently used.

None.—Child not taken for inspection on 8th day.

Development of pocks delayed. Nothing abnormal noted until 12th day, child then fretful, pocks covered with dark scabs, and surrounded by some inflammation. Two days later the redness had left the seat of vaccination, but tissues of shoulder and adjacent side of chest were hard, swollen, and dusky red. The swelling and redness spread half-way down chest. Thrush re-appeared in mouth and child gradually sank, and died on the 18th day.

Two instruments used; clean and bright when inspected, one spotted with rust at the point. All said to be disinfected with carbolic solution between each vaccination.

None till 16th day when hot fomentation to inflamed parts and free use of stimulants were ordered.

Child not examined before vaccination. Register not accurately kept. Illegitimate child, had suffered from thrush and redness round anus when six weeks old, hand-fed and nursed by grandmother, said by her to be healthy; this is doubted by doctor, who looked on it as feeble.

* *This case is also amongst those brought to the notice of the Commission with a view to their investigation; being the same as that numbered as Case 69 on page 257. The case was not, however, investigated by a medical man on behalf of the Commission.*

Family history. Nothing of importance noted.

General surroundings. Nothing bearing on the case noted, no known exposure to infectious disease.

Sanitary conditions. Nothing of importance noted.

Summary of reporter's conclusion. Reporter considers that on the evidence obtainable in this case, it is not possible to arrive at a definite opinion as to the causation of the erysipelas. He calls attention to the child's condition, to the method and place of operating and to the lymph, to none of which does he think that blame can justly be attached. He is unable to explain the abnormal symptoms which occurred in four of H.'s co-vaccinees by any facts that came to his knowledge in the course of his enquiry.

[T. D. A.]

CASE CXCIII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.* $\frac{AA_c}{2}(2)$.

(*Report dated 19th October* 1891.)

Case of. C. A. M., male, aged five weeks.

Vaccination. August 11th when 14 days old in L. Infirmary by Dr. B.

Death. September 5th, 1891.

Certified cause. "Acute bronchitis and vaccination."

Certified by. Mr. F. who said that he ought to have certified death as from septic pneumonia, and that he believed that the child had really died from vaccination. He is opposed on principle to vaccination.

Source of lymph. Warlomont's calf lymph. No record kept as to particular source.

Co-vaccinees. Several. Register imperfect. Number not known.

Sub-vaccinees. By inference none.

Course of vaccination. On 8th day mother and child left L. Infirmary. The four vesicles then looked normal with some indication of areola, next day "little white heads" noticed by mother between and around the pocks, these were seen by the infirmary nurse on the 14th day. Two days later these "heads" began to coalesce forming by the 18th day a large hole ¼ inch deep with much offensive discharge. An axillary swelling formed and subsided. On 23rd day child began to cough, three days later it failed to take its food, had three "fits," was found by the doctor, who saw it, to be suffering from pneumonia, and a few hours afterwards died.

Method of vaccination. A "separate bright and clean needle used for each " child."

Treatment of vesicles. Vaseline after 8th day advised by infirmary nurse; that used had been applied to various purposes. Arm treated after 18th day under medical advice, as an "ulcerated arm" with "ung. cetacii."

Previous history. Child illegitimate, but well developed and healthy when born, and on leaving infirmary six days afterwards on returning was dirty and poorly.

Family history. No particulars noted.

General surroundings. Filthy, after leaving the Infirmary.

Sanitary condition. No particulars noted.

Summary of reporter's conclusion. Reporter is of opinion "that the ulceration of the " arm was subsequent and possibly caused by the " application of vaseline which had been in use for a " length of time, possibly aggravated by filthy sur- " roundings and by violence in removing the rag, to " which indeed the mother confessed." He does not doubt that the wound on the arm sufficiently accounted for the septic pneumonia.

[T. D. A.]

CASE CXCIV., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.† $\frac{G}{1}(2)$.

(*Report dated 21st October* 1891.)

Case of. H. S., female, aged two months.

Vaccination. April 23rd, 1891. Dr. P., *locum tenens* for Mr. P., Public Vaccinator, in four places.

Death. June 10th 1891.

* *This case is also amongst those brought to the notice of the Commission with a view to their investigation; being the same as that numbered as Case 85 on page 265. The case was not, however, investigated by a medical man on behalf of the Commission.*

† *This case is also amongst those brought to the notice of the Commission with a view to their investigation; being the same as that numbered as Case 65 on page 256. The case was not, however, investigated by a medical man on behalf of the Commission.*

Certified cause. "Vaccinia."

Certified by. Mr. D.

Source of lymph. Direct from arm of L. F. (No. 371). As one vesicle only rose vaccination was again performed in one place only on the other arm. Source of lymph for this vaccination not stated.

Vaccinifer. Plump, healthy child. Somewhat "undue areola," arm rather long in healing, vaccination otherwise normal, no spots on arm or body. No history of syphilitic taint.

Co-vaccinees. Two according to register, F. and McL. Another child K., however, entered by error as vaccinated from 370, appears also to have been vaccinated from No. 371. F. was vaccinated twice, first from 371, one vesicle out of four only took, and she was re-vaccinated from another source. McL. had only vesicle, K. two, from four insertions in each case.

No other irregularity was noted.

Sub-vaccinees. Not stated.

Course of vaccination and illness. On 8th day one vesicle only had formed, it had not burst, nor was there abnormal inflammation. Child was not seen by Dr. P. until 13th day, when finding only one place had taken he "vaccinated another "place" on the other arm. This place did not take. Child at this time was well, but "there were one or "two little white places breaking out round the "original white vesicle which had scabbed over." During the third week mother states fresh spots came out round the vaccination place. These spread and looked like ordinary vaccination vesicles, subsequently they coalesced. Later similar spots appeared all over the body, extremities, face, mouth, and head, more particularly round the mouth, side of nose, behind the ear, between fingers and toes, soles of feet, on the back, and one at the navel. Child did not appear ill until a week before death. Several doctors saw the child; from their statements it appears that a papular eruption commenced between 14th and 15th day after vaccination, in the neighbourhood of the vaccination wound, spreading later on the body.

Vesicles subsequently developed, in many cases umbilicated and resembling vaccination pocks mostly containing serum, occasionally mixed with blood; in size varying from that of "a split pea to a shilling." Some developed into pustules; in some a "necrotic "process" seems to have occurred, more especially in the original vaccination place, and about the nose. They were mostly circular, some irregular as though "two or more had coalesced." Some had an areola of about one-eighth of inch. Some of the vesicles dried up and "became covered with flat scabs," others seemed to extend "laterally." They appeared in successive crops; which ceased from 29 to 31 days after vaccination. The eruption was not symmetrical. It is variously described as "something between herpes "zoster and pemphigus," and as "like an uncommon "case of pemphigus."

The doctors were generally of opinion "that the "case was not one of syphilis."

Method of vaccination. An "instrument containing three needles" used; kept exclusively for vaccination. Cleaned between each vaccination.

Treatment of vesicles. A new shield was used. Nothing applied to the arm but by medical advice.

Previous history. Stated to have been healthy before vaccination.

Family history. Parents stated to be healthy, but mother was suffering from white leg at the time of child's vaccination. There was no discharge. She has had no miscarriages. The two surviving children are healthy. Mother has two brothers and three sisters living, all healthy, but one sister dying of consumption.

General surroundings. House untidy and not very clean.

Sanitary condition. Satisfactory.

Summary of reporter's conclusion. Reporter draws a comparison between this case and Cases LVIII. and CLXII. of this series, and with cases reported by Mr. J. Hutchinson, Med. Chir. Trans., 1882, p. 1, and Mr. H. Stokes, Dublin, J. Med. Sc., June 1880.

Reporter suggests three hypotheses:—

(a.) That vaccination merely "called into activity a "latent condition to which child was predis-"posed, and would probably have suffered "sooner or later."

(b.) That some "peculiar diathesis or tissue condition "of the child modified and exaggerated the "action of normal vaccine lymph."

(c.) That the abnormal result was due to some "deleterious property of the lymph."

He considers that the "unusual manifestations" in the case of H. S. were probably brought about by a combination of the two later conditions, viz., a "peculiar tissue condition" acted upon by lymph not strictly normal, the poor results of the vaccinations from the particular lymph source in question, possibly indicating "some abnormality in the lymph."

[T. D. A.]

Case CXCV., reported to the Local Government Board by the Local Registrar.*

(*Report dated 26th October* 1891.)

N. H., female.

August 14th, 1891, by Dr. B——n, Public Vaccinator, in three places.

September 5th, 1891.

"Vaccination, 21 days; erythema; exhaustion."

Mr. J. W. B——e.

Direct from arm of H. B., aged 6 months.

Healthy. Vaccination normal, three normal scars. He had in turn been vaccinated from B., whose vaccinifer is unknown, no record having been kept of H. B.'s four co-vaccinees, one could not be found, and in one vaccination had failed; no other irregularity is reported, and none of the cases showed any tendency to excessive inflammation.

Five. Vaccination in all of them was normal, except that in one case, only one pock formed. There was no tendency in any of them to excess of inflammation.

None. Vesicles not opened.

Up to 8th day, apparently normal, two days later redness began to spread from the pocks, extending to fingers by 15th day, and during the next four days spreading over neck and back to the other arm. The affected parts became hard, "and little white blisters "formed, discharging watery matter." Great exhaustion resulted and the child was "convulsed." Finally she refused food and died on the 23rd day. The child was under medical treatment after the 9th day.

Cooper Rose vaccinator used, which was clean when inspected. Vaccinator reported as a "careful and "conscientious officer."

Hot bread poultice on 9th day.

Good.

Mother pasty and anæmic. One child healthy, one strumous looking, and has suffered greatly from eczema.

No known exposure to infectious disease. The day of inspection "wet and rainy."

Living room very stuffy, and ill ventilated. Bedroom "rather less offensive than the sitting room." The cottages, of which the child's home is one, are old and dilapidated, ill protected from the rain, which enters freely, and causes damp walls and ceilings. Closets and gullies in an unsatisfactory state.

Reporter is of opinion that the non-appearance of inflammation before the 10th day makes it unlikely "that vaccination caused the fatal issue in any but an "indirect manner"; and further that the normal course of vaccination in the child's co-vaccinees, and vaccinifer tends to confirm this view. He considers the affection to have been erysipelas, and that it was implanted at or soon after inspection, but he was unable to trace any direct contact with infectious or septic matter. He considers that the child lived under abnormally unwholesome conditions, and that the evidence points to local absorption at the vaccination site.

[T. D. A.]

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* *This case is also amongst those brought to the notice of the Commission with a view to their investigation; being the same as that numbered as Case 84 on page 265. The case was not, however, investigated by a medical man on behalf of the Commission.*

CASE CXCVI., REPORTED TO THE LOCAL GOVERNMENT BOARD BY ONE OF THE BOARD'S INSPECTORS

(*Report dated 11th November* 1891.)

H. C., male, aged three months.

October 1st, 1891, by Mr. S., privately.

October 22nd, 1891.

That death was due to "septicæmia after vaccination, "probably from the use of tainted cream used as a "dressing."

From child L. Whether arm to arm or from a tube Mr. S., who has no record, cannot say. Person who took H. C. to be vaccinated said it was from child's arm.

"Reputed vaccinifer" found to be healthy. Vaccination normal. Stated to have been vaccinated with calf lymph.

Mr. S. states that "probably" several other children were vaccinated from same source, but no details could be obtained.

None. Of this Mr. S. was positive, stating that "he "knew too much of his previous history."

Vesicles normal on day of inspection.

Subsequently vesicles burst, and did not heal. Sores had a "curious punched out appearance." But child's health did not suffer. On October 19th or 20th a rash like measles appeared, and child became feverish and ill; on morning of October 22nd it was "found dead "in bed." A post-mortem examination was made, but threw no light on the case.

Note.—Mr. S. is stated to have attended another child for "measles" in the same house on October 22nd.

Not stated.

Sores dressed with cream.

Child "puny and ill-nourished from birth." Mr. S. stated he had attended H. C. almost from birth for syphilis; under mercurials child had apparently recovered, and is stated to have been "fat and healthy "looking" when vaccinated.

Mrs. C. had been unwell for some time; she suffered from "sore eyes" and "sore throat."

Not stated.

Not stated.

Reporter concludes that "from the evidence it "appears doubtful as to what was the cause of death "in this case," and he considers the vaccinator "in-"discreet in performing that operation at so short an "interval after he had been treating it "(the child)" "for syphilis."

[T. D. A.]

CASE CXCVII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.*

(*Report dated* 3*rd December* 1891.)

M. T., female, aged three months.

Private, in two places. Date uncertain. Mother states July 10th (1890), certificate of vaccination signed July 21st by Mr. V. Vaccinator Mr. T., Mr. V.'s unqualified assistant.

August 19th, 1890.

"Erysipelas (after vaccination)."

Mr. H.

Not known. No record kept. Mother states it was "from a tube."

No record.

No record.

Mother states arm bled freely at time of operation; on the following day it became inflamed. On 8th day when inspected three tubes were charged from vesicles. On 12th day extensive swelling of arm, subsequently extending "all down the arm and over the child's "body." Towards the end of July symptoms ameliorated, but about August 12th child became worse again, and died August 19th.

Mr. H who attended the child states on August 12th the erysipelas extended to the hand on vaccinated arm, also to face, trunk, and leg on the same side; subsequently it spread all over the body, disappearing in one place and reappearing in another. There were no blisters and no suppuration. Vesicles were well formed, and nothing abnormal about them.

Method of vaccination. Vaccinator states he keeps a separate lancet for vaccinating and frequently sterilizes it. His statements, however, on other points are not reliable.

Treatment of vesicles. Bread and water poultice applied by doctor's orders. Mother also applied "cold cream" and "raw cream." Vesicles not injured.

Previous history. Child stated to be healthy before vaccination.

Family history. Parents healthy. No other child.

General surroundings. House clean. No defect noted.

Summary of reporter's conclusion. Reporter gives no separate summary, this being one of four cases (Cases CXCVIII., CXCIX., and CC.) reported on at the same time, but in a general summary he notes that "erysipelas apart from vaccination was "more prevalent than usual."

[T. D. A.]

CASE CXCVIII., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE LOCAL REGISTRAR.* A c / 1 & 2 (1. V²).

(*Report dated* 3*rd December* 1891.)

Case of. L. D., female, aged three months.

Vaccination. Stated by mother to have performed June 10th, 1890, by Mr. S., privately, in one place.

Death. July 7th, 1890.

Certified cause. "Erysipelas (after vaccination) 14 days; exhaustion."

Certified by Mr. C.

Source of lymph Not known. Said to be lymph from a tube.

Co-vaccinees. No record kept.

Sub-vaccinees. No record kept. Lymph stated by mother to have been taken from child's arm.

Course of vaccination and illness. Arm stated by mother to have been "swollen and "much inflamed" on 8th day. On 12th day Dr. C. who attended the child states there was abnormal inflammation around the pocks. The erysipelas subsequently spread over the entire body fading in one part and re-appearing in another. There were no "blisters, and no suppuration." Signs of peritonitis appeared before death.

Method of vaccination. Mr. S. keeps no record of his vaccinations. He states he is careful in choice of vaccinifers, but his reputation is not good and his statements cannot be relied on. He makes a practice of vaccinating in one place only.

Treatment of vesicles. Vesicle dressed with fresh cream. No shield used; arm not rubbed.

Previous history. Child stated to have been healthy.

Family history. Parents and six other children all said to have been healty. Mother's brother, who who lived in the house, had sufferred from sore throat a fortnight before child was vaccinated; stated by doctor to have been diphtheria, by mother quinsy. The case had not been notified as diphtheria.

General surroundings. House fairly clean; low situation and somewhat built in, but family had been there 25 years and been healthy. Father had to do with clippings of "sheep-"skins" occasionally putrid, but is stated rarely to have held the child. Erysipelas and diphtheria prevalent in the neighbourhood at the time.

Sanitary condition. No drains indoors; nothing further of importance noticed.

Summary of reporter's conclusion. Reporter draws attention to the prevalence of erysipelas at the time, and to the occurrence of the suspected case of diphtheria in the house shortly before child's vaccination. (See also Cases CXCVII., CXCIX., CC.)

[T. D. A.]

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* *This case is also amongst those brought to the notice of the Commission with a view to their investigation; being the same as that numbered as Case 76 on page 261. The case was not, however, investigated by a medical man on behalf of the Commission.*

* *This case is also amongst those brought to the notice of the Commission with a view to their investigation; being the same as that numbered as Case 75 on page 261. The case was not, however, investigated by a medical man on behalf of the Commission.*

Ac 1 (2).

CASE CXCIX., REPORTED TO THE LOCAL GOVERNMENT BOARD BY ONE OF THE BOARD'S INSPECTORS.

(Report dated 3rd December 1891.)

Case of. B. E. W., female, aged four months.

Vaccination. Date not stated. Vaccination certificate signed June 10th. By Mr. S., privately, in one place.

Death. July 20th, 1890.

Certified cause "Erysipelas; convulsions."

Certified by. Mr. H.

Source of lymph. Not known. No record kept. Said to be tube lymph.

Note.—B. E. W. and L. D. (See Case CXCVIII.) were both vaccinated by Mr. S. B. E. W. by inference a week previous to L. D. Reporter points out that B. E. W. was not, however, vaccinifer to L. D., the vesicles being delayed and not sufficiently formed on 8th day.

He, however, suggests the possibility of both children having been vaccinated from same source, as tube lymph was used in both cases.

Co-vaccinees. Not stated.

Sub-vaccinees. None.

Course of vaccination and illness. Vesicles apparently delayed, otherwise vaccination proceeded normally until end of second week, when redness appeared round the pock. Arm became swollen to the fingers; subsequently the inflammation spread to head, trunk, and extremities. There were no blisters or sores.

Method of vaccination. Vaccinator's proceedings unsatisfactory. (See Case CXCVIII.)

Treatment of vesicles. Vesicles not opened or injured. Dressed with fresh cream.

Previous history. Child stated to be healthy before vaccination.

Family history. Parents healthy.

General surroundings. House good and well ventilated. No illness in the house at the time. Erysipelas prevalent in the neighbourhood.

Summary of reporter's conclusion. See Cases CXCVII., CXCVIII., CC.

[T. D. A.]

Ac 2 (3. V.)

CASE CC., REPORTED TO THE LOCAL GOVERNMENT BOARD BY ONE OF THE BOARD'S INSPECTORS.

(Report dated 3rd December 1891.)

Case of. C. L. P., female, aged ?

Vaccination. July 29th, 1890, by Mr. M., Public Vaccinator.

Death. August 21st, 1890.

Certified cause. "Erysipelas; diarrhœa."

Certified by. Mr. S.

Source of lymph. From A. F., No. 347 in register.

Vaccinifer. Healthy. Vaccination normal.

Co-vaccinees. Two. One only could be found, but vaccination appears to have been normal in both.

Sub-vaccinees. According to register none, but vesicles were opened and lymph taken.

Course of vaccination and illness. Arm apparently normal when inspected on 8th day, but child pale and was teething.

About 15th day swelling and redness appeared around pocks, which were beginning to dry up, "later purple "redness and swelling spread down the arm and over "the body, a lump formed in the back, and a blister "on the genitals, but there was no discharge." Mother states there was no diarrhœa.

Mr. S. does not remember the case.

Note.—An elder sister was notified on August 19th as suffering from erysipelas, but as the case of C. L. P. was not notified it is possible one name was by accident inserted for the other.

Method of vaccination. Mr. M. stated to be a careful and successful vaccinator.

Treatment of vesicles. No shield used. No application made to the vesicles, which were not injured or rubbed.

Previous history. Not stated, but child had cut two teeth before three months old.

Family history. No details given except that Mrs. P. appears to have suffered from diphtheria previously. On July 11th she was still not well. There was no disinfection as case had not been medically notified.

General surroundings. Nothing of importance noted.

Sanitary condition. Stated to be good.

Summary of reporter's conclusion. Reporter notes that "at the time when the above "cases occurred, erysipelas, apart from vaccination, "was more prevalent than usual in A., and that two of "the four cases of erysipelas after vaccination occurred "in houses in which shortly before there had been sus-"pected cases of diphtheria." (See Cases CXCVII., CXCVIII., and CXCIX.)

[T. D. A.]

Ae 1

CASE CCI., REPORTED TO THE LOCAL GOVERNMENT BOARD BY THE PUBLIC VACCINATOR.*

(Report dated 12th December 1891.)

Case. G. B., male, aged five months according to Mr. L. Ten months according to the mother, but she is of weak intellect.

Vaccination. July 8th, 1891, by Mr. L., Public Vaccinator.

Vaccination had been postponed by Mr. B. on May 20th, 1891, on account of "debility after measles."

Death. August 4th, 1891.

Certified cause. "Infantile decay, 14 days;" "exhaustion from "ulcerated arm after vaccination."

Certified by. Mr. B.

Source of lymph. Humanised lymph stored in tubes from National Vaccine Establishment.

Vaccinifer. Not stated.

Co-vaccinees. Nine. Two could not be found. In all the others vaccination was without complication, though in one, three insertions; in three, two insertions; and in one, one insertion failed; and in one, healing was delayed as the scabs had been rubbed.

On the same day 47 vaccinations were successfully performed with Renner's calf lymph. Two insertions of the whole number only being without result.

Sub-vaccinees. None.

Course of vaccination. The account given by mother is not reliable as she can speak no English, and is said to be of weak intellect. Vaccination proceeded normally until the 8th day. During the second week the two lower scabs became detached. The father stated that they had been "torn "off by the finger nails of one of the other children." The mother denied this, but no importance is attached by reporter to her denial. Subsequently at the point of the two lower pocks two deep suppurating ulcers formed.

Method of vaccination. The lymph of eight tubes mixed on a glass slide. A fixed grooved blade used, kept in good order and wiped after each vaccination.

Treatment of vesicles. Not recorded.

Previous history. Child feeble from birth, and further exhausted by measles.

Family history. Not stated.

General surroundings. Home in a court which had been condemned as unfit for human habitation; houses back to back, and with a four-foot alley between them.

Sanitary condition. Bad.

Child not known to have been exposed to any infectious disease after vaccination.

Summary of reporter's conclusion. Reporter is of opinion that "G. B.'s death was due "to the debilitating effect of an attack of measles in "a child of feeble constitution; that effect aggra-"vated by exhaustion of two suppurating ulcers on "the site of two vaccine pocks which had been torn "and probably poisoned by another child's finger "nails."

[T. D. A.]

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* *This case is also amongst those brought to the notice of the Commission with a view to their investigation; being the same as that numbered as Case 80 on page 202. The case was not, however, investigated by a medical man on behalf of the Commission.*

V).

Case CCII., reported to the Local Government Board by the Local Registrar.*

(*Report dated 14th December* 1891.)

C. W. H. L., male, aged four months.

August 24th, 1891, by Public Vaccinator, in four places.

September 20th, 1891.

"Vaccinia, 27 days; erysipelas, 17 days; axillary "abscess, 14 days."

by. Not stated. By inference by Public Vaccinator.

From arm of a child, name not stated.

er. A healthy child. Vaccination normal.

Three. Vaccination normal in all.

Four. In two vaccination normal. One suffered from bronchitis before vaccination, and died of it five weeks later. In the other scabs were rubbed and discharged slightly.

Vesicles normal when inspected on 8th day. All the vesicles opened. The pocks continued to discharge a watery fluid which became purulent. On 15th day child was seen by Public Vaccinator, who states that there was "marked redness and swelling of the vacci- "nated arm" extending to wrist, shoulder, and adjacent half of body. There was also an axillary swelling. The points of vaccination were sloughing sores. The inflammation rapidly spread over trunk, extremities, head, and face; an abscess formed and was opened in the axilla on September 15th, 23rd day after vaccination.

Vaccinator used a scarifier. He cleanses and disinfects his instrument after each operation; when inspected they were clean. There had been no known infection of vaccinator's person or clothes.

Mother used a clean handkerchief for mopping the vesicles, and applied cream with her fingers. Subsequently boracic lotion applied by medical advice. No shield used. Vesicles believed not to have been irritated.

Stated to have been good.

Father healthy. Mother suffered from three attacks of erysipelas of face before 10 years old. On 6th day after child's vaccination she suffered from sore throat, lasting some days. During this time Mrs. L. continued to nurse the child. On September 12th, 20th day after C. W. H. L.'s vaccination, Mrs. L. developed a "well-marked attack of erysipelas of the face." A week previous to the vaccination, Mrs. L. had suffered from a boil in the right breast, which is stated not to have suppurated. C. W. H. L. was a first child.

House not very clean.

Scarlet-fever prevalent, but not in immediate neighbourhood of L.'s house.

Bad. Closet a few feet from door, filthy, of bad construction and ill-flushed; water supply from pump closely adjacent to closets, drains, and street sewer.

of Reporter is of opinion that neither the lymph nor the circumstances of the vaccination appear to have been the cause of the child L.'s illness. He draws attention to the predisposition to erysipelas in the mother, and notes that this predisposition was probably inherited by the child; further, he considers that, in view of the mother's subsequent attack of erysipelas on the 20th day, the previous sore throat from which she suffered on the 6th day after the child's vaccination was probably of an erysipelatous origin, and that C. W. H. L. may have been infected directly from her; he also draws attention to the dangers arising from the application of cream to the discharging wounds, and concludes that the erysipelas from which L. suffered "was "due to one of these two latter circumstances (either "application of dairy cream or infection from the "mother's sore throat), aggravated, perhaps, by insa- "lubrious surroundings; . . . . but to which ". . . . it does not seem possible with certainty to "say."

[T. D. A.]

* *This case is also amongst those brought to the notice of the Commission with a view to their investigation; being the same as that numbered as Case 90 on page 269. The case was not, however, investigated by a medical man on behalf of the Commission.*

Case CCIII., reported to the Local Government Board by the Local Registrar.* Ab 2 (3. V.)

(*Report dated 17th December* 1891.)

R. E. M., male, aged four months. *Case of.*

October 5th, 1891, by Dr. W., Public Vaccinator, in four places. *Vaccination.*

November 16th, 1891. *Death.*

"Vaccination, six weeks; cellulitis, 14 days; ex- "haustion." *Certified cause.*

Mr. J. H. B. *Certified by.*

Direct from the arm of A. S. *Source of lymph.*

Vaccination normal. No statement as to child's condition. *Vaccinifer.*

One. Vaccination normal. *Co-vaccinees.*

Three. Vaccination without complication of any kind, except that the scabs had been rubbed in one case and healing delayed. Some tubes also were filled but could not be traced. *Sub-vaccinees.*

The pocks looked healthy on eighth day. About a fortnight later (*i.e.*, three weeks after vaccination) redness appeared round each pock, especially round the inner and upper one, from which the scab had come off (according to the mother's statement) about the 11th day. The wound then "skimmed over" no proper scab forming. *Course of vaccination.*

When taken to a doctor on November 3rd the child had "four deep unhealthy-looking ulcers on the arm "with dirty, sloughy bases and pale, flabby edges" with offensive discharge, surrounded by a zone of cellulitis about three inches in diameter. The inflammation spread over trunk and upper extremities, and the child died exhausted on the 42nd day. After death "black patches" were noticed by mother on eyelid and dorsum of both feet.

Careful and exact. *Method of vaccination.*

Zinc ointment, cold cream, and carbolic oil, applied by mother. Child not taken to a doctor for a month. Doctor ordered lotion and made incisions. *Treatment of vesicles.*

Good: "The child ailed nothing until some 3 weeks "after vaccination." *Previous history.*

Father died of "congestion of the lungs and pleu- "risy" a few months before the child's birth. Two children had died, one of whooping cough, and one of diarrhœa; three living and healthy. No history of syphilis in parents, or evidence of it in the children. Mother suckled child and had no sore on nipples. *Family history.*

No known exposure to infectious disease. *General surroundings.*

"No marked shortcomings except that drinking "water and supply to w.c. came from the same "source." *Sanitary condition.*

Reporter is of opinion "that inasmuch as the symp- "toms from which the child M. suffered did not "appear until three weeks after vaccintion it would "not be correct to infer that vaccination had directly "caused them," and that the early removal of one crust and the appearance of inflammation round this point are suggestive that some local inoculation occurred at this spot, but in what way it is not easy to say. He thinks that a sufficient explanation may be found in the mother's active intervention with various medicinal substances, which could doubtless have set up "fatal inflammatory action." *Summary of reporter's conclusion.*

[T. D. A.]

Case CCIV., reported to the Local Government Board by the Local Registrar.† B 2 (3).

(*Report dated 18th December* 1891.)

S. S., female, aged three months. *Case of.*

October 28th, 1891, by Dr. B., Public Vaccinator, in four places, on left arm. *Vaccination.*

November 21st, 1891. *Death.*

"Vaccinia; septicæmia; broncho-pneumonia." *Certified cause.*

* *This case is also amongst those brought to the notice of the Commission with a view to their investigation; being the same as that numbered as Case 97 on page 273. The case was not, however, investigated by a medical man on behalf of the Commission.*

† *This case is also amongst those brought to the notice of the Commission with a view to their investigation; being the same as that numbered as Case 99 on page 274. The case was not, however, investigated by a medical man on behalf of the Commission.*

Certified by. Dr. H.

Source of lymph. With lymph previously *collected in a tube* from child C., vaccinated October 21st.

Vaccinifer. "Somewhat puny" but in good health. Vaccination normal.

Co-vaccinees. Three. In two vaccination normal. In one the places had coalesced, and healing had been delayed owing to "acknowledged and accidental rubbing."

Sub-vaccinees. None. Vesicles not opened. Two children were vaccinated November 4th from one of S. S.'s co-vaccinees, vaccination normal in both.

Course of vaccination and illness. Parents could not be found, but grandmother stated all went well until about a fortnight after vaccination, when scabs got rubbed off. A few days after redness appeared round the places, subsequently sloughing ulcers formed at the points of inoculation, which nearly coalesced, a deep abscess formed in palm of the *right* hand, and another under the *right* ear.

On November 19th child was admitted to ——— Hospital, the palmar abscess having been opened on the previous day. There was then "deep œdema below "the clavicle, and above the ulcers." The parotid abscess subsequently opened into the external auditory meatus. Broncho-pneumonia supervened and the child died November 21st.

Method of vaccination. An ordinary lancet used, kept for vaccination only, and clean when inspected. Lymph collected in a tube and blown on to the arm. Scarifications made through the lymph. Public Vaccinator appeared to be "careful "and cleanly." Station clean and airy.

Treat of vac. The rubbed vesicles treated by mother with bread poultices, subsequently with ointment by doctor's advice.

Previ. histor. Not stated, but child when brought to ——— Hospital was in very dirty and neglected condition.

Famil. histor. Not stated.

Gener. surrog. esge. House crowded, ill-ventilated and extremely dirty, in miserable locality. No known infectious or septic illness in house or vicinity.

Sanit. condi. Bad. Closet extremely foul, and without water. In backyard "reeking collections of refuse and garbage."

Summ. of report & conclus. Reporter is of opinion that the "immunity from ill "effect of the vaccinifer, the three co-vaccinees, and "the two sub-vaccinees of one of the co-vaccinees" may exculpate the lymph from any share in the "fatal "issue." He considers it clear that the child died of septicæmia, but how set up there is no definite evidence to show, but he thinks the cause may "with "some justice be sought in the unusually unwhole-"some surroundings of the child . . . . and the "dirty and neglected state into which she was allowed "to fall by those responsible for her care."

[T. D. A.]

SIDNEY COUPLAND, M.D.
THEODORE DYKE ACLAND, M.D.

3rd April 1893.

II.—Memorandum, prepared by Dr. Edward Ballard, and forwarded to the Commission by the Local Government Board, on the two hundred and five cases in which death, occurring on or between the 1st November 1888 and the 30th November 1891, had been alleged or suggested to have been connected with Vaccination, and which had been reported on by Medical Inspectors of the Local Government Board.

Dr. Ballard's Memorandum.

In the early part of 1890 I received instructions from the Medical Officer to prepare from précis of Inspectors' Reports, furnished to me then, and from time to time subsequently, in respect of instances of fatality following or alleged to have been the result of vaccination, certain tabular analyses. The instances of fatality which I was instructed to analyse dated from November 1, 1888.

Dr. Buchanan appears to have commenced making these analyses himself, perhaps merely to indicate to me the form in which he wished the tables prepared, and the sort and amount of information that he desired they should contain. This form I adopted, using, however, the discretion he left me as to general arrangement. The result of this primary analysis is presented in Table I. forwarded herewith. (*See pages* 90–145.) The analytical tables of fatality were continued, as the inspectors' reports came in, and they included all deaths reported to the end of November 1891. Altogether the Table I. relates to 205 instances of fatality.

These tables having been completed, I was instructed to follow them up by a variety of numerical inferences which might appear to be deducible from them. This involved considerable labour, and the construction of a variety of subsidiary tabulations so constructed as to bring out points in respect of which information seemed desirable. These subsidiary tables in detail and in summary I also forward to the Board.

Inter alia, inferences appear capable of being drawn upon the following points, viz., in respect of each group into which the fatal cases are arranged:—

The proportion of public and private vaccinations.
The ages at vaccination.
The number of insertions made.
The kind of lymph used in vaccination.
The period after vaccination at which abnormality commenced, and its significance.
The relation of the abnormalities observed to—
  The vaccinifer.
  The vaccinator or subsequent operator.
  The condition or family peculiarities of the vaccinee.
  The possible or probable operation of other influences than vaccination, *e.g.*, home surroundings, improper management, &c.

The cases of Group I. may be generically termed septic cases; those of Group II. syphilitic cases; while those of Group III. are cases which there appears no reason to place in either of the former groups.

As to Group I., it appeared impracticable to make any satisfactory sub-division. I have contented myself, therefore, in the subsidiary tabulations with marking with a star (*) those cases in which the occurrence of any ulceration of the vaccinated spots is mentioned in the reports. Of the 205 fatal cases tabulated 150 belong to this group.

As to Group II., it must be observed that in the subsidiary tabulations I have thrown out two cases mentioned in Group II. of the primary analysis, and transferred them, being obviously not syphilitic nor septic cases, to Group III., viz., Nos. xlviii. and xlix., so that the number in this group is regarded not as seven but as five.

Group III. is a very miscellaneous one, containing cases of fatal disease occurring, indeed, at various periods, some near to, and some distant from, that of vaccination, and very various indeed in nature, *e.g.*, cases of eruptive or infectious fevers, of pulmonary inflammations, diarrhœa, thrush, scrofula, constitutional debility, infantile convulsions, &c., with which vaccination cannot be regarded as having been directly, and perhaps in only a very few cases even indirectly or remotely concerned. Of these the number is 50.

The chief concern of the Commission, and perhaps it will be regarded as its only concern, will be with the 155 cases in Groups I. and II. When there are taken into consideration the pains taken and means adopted to obtain information of every fatal illness occurring during the period in question (some three years), as to which it had been alleged or suspected that the operation of vaccination had been concerned as a cause, and when the number 155 is compared with the total number of vaccinations performed during the same period throughout the kingdom (which can approximately be ascertained) some sort of practical estimate may be formed of the small amount of fatal mischief done by vaccination, even on the assumption that vaccination was directly or indirectly (ever so remotely) concerned in the subsequent illnesses. But this small estimate of fatal mischief will be still further and greatly reduced when the circumstances of the individual cases are considered, and all the morbific influences other than the vaccination possibly or probably operative in each case are taken into account.

Group I.

As respects the efficient cause in operation to produce the fatal illnesses after vaccination in the 150 cases in this group, it is to be kept in mind that, as is the case with other operations in which a wound is inflicted, a favourable or unfavourable result is dependent, not merely upon the wound, but upon the circumstances under which it is made, upon the conditions under which the recipient of it is subsequently placed, and upon healthiness, unhealthiness, or idiosyncracy of the recipient himself. In association with all these we have to consider in vaccination the introduction into the wound of a specific morbid contagium (the vaccine virus), not itself of a septic character, that is to say, not in itself normally producing such results as the cases in Group I. exhibited.

Before proceeding further, however, with this subject, a few words appear desirable in refutation of a view which has, I believe, been propounded (partly probably in consequence of the use made of the words "erysipelas" and "erysipelatous" by the early vaccinators) that erysipelas virus is inherent in vaccine virus, and invariably part and parcel of every vaccine inoculation; that the areola is in fact the normal manifestation of this invariable combination; and that this is so is shown by the impossibility of defining precisely the boundary line between normal areolous inflammation and erysipelatous inflammation.

1. Do we agree in the definition of the term "erysipelas"? The term is, so far as I know, only used by medical men to designate a cutaneous inflammation, the great characteristic of which is its tendency to spread more or less extensively along the surface. Where this tendency is not exhibited, medical men decline to call a cutaneous inflammation either "erysipelas" or "erysipelatous." In perfectly normal vaccinia this tendency to spread is absent. The inflammation does not spread beyond the skin immediately surrounding the maturing vesicles, and declines as they decline, shrivel, and dry up. To call the normal areola erysipelas or erysipelatous is, therefore, a misnomer.

2. An analogue of the "areola" is seen in small-pox inoculation, in which a similar but more severe local inflammation surrounds the primary pustule. No one calls this erysipelas. It similarly dies away without spreading.

Dr. Ballard's Memorandum.

3. If erysipelatous virus were such an invariable concomitant of vaccine, how are the two diseases to be separately defined? It would have to be denied that there exists any such pure specific disease as vaccinia. Can there be mentioned any other similar invariably compound specific malady? It must then be a pathological anomaly.

4. Spreading inflammation of the cutaneous tissues is only of occasional occurrence in vaccination. Similarly axillary swelling or abscess, a sore syphilitic or not at the vaccinated spot, &c. are only of occasional occurrence. Such "occasional" occurrences in the course of other diseases are commonly called "complications." Medical men do not at once rush into the conclusion that the occasional lesion is an essential part of the primary or principal disease, and the etiologist asks himself in each such occasional occurrence what special circumstance gave rise to it. Why should erysipelas be dealt with otherwise?

But what if the suggested thesis be that the erysipelas virus is inherent in some samples of virus only, and that it is impossible to distinguish *a priori* in which samples of virus it is present and in which it is absent; thus dropping the "areola theory," and basing this new assumption on the multiplicity of micro-organisms in vaccine lymph, some of which may be of septic nature?

1. I should admit the possibility. It would mean that erysipelas virus is distinct essentially from vaccine virus, but may have something occasionally superadded to it. This is our own position. The presence of erysipelas or septic virus occasionally in admixture with the vaccine virus at the time of its inoculation is with us one of the many agencies through which erysipelas or other septic disease may be caused as an accompaniment or sequence of vaccination.

2. But speculation as to what *may* be must not be placed on the same level as clinical experience, far less above the teachings of experience. Erysipelas as a concomitant or sequence of vaccination is in medical experience no different from erysipelas as a concomitant or sequence of other diseases or wounds of the integument. All that applies etiologically to the one applies to the other also. Before anyone can change "may be" the cause" into "is the cause," it will have to be shown that vaccinia is a protection against casual local erysipelatous infections, although not against infections introduced at the time of vaccination.]

The first point to be noted in the study of the Addendum A. is the remarkable frequency with which conditions conducive to fatal septic mischief other than unfitness of the vaccinifer, personal infectiveness of the operator, or readily avoidable negligence of precautions in the performance of the operation, are mentioned in the reports.

Next, with what frequency two or more of the enumerated circumstances might have co-operated in an individual case. It is rare to observe only one of these circumstances marked × against a case in Table II. All marked × may have had in some cases an etiological relation to a fatal illness.

Hence it becomes important to estimate and distinguish—1. Some of them are of a character to introduce a septic contagion into the system either locally at the puncture or pock or through another channel. 2. Others to favour a casual infection by opening a way for it, or disposing the system to its operation or by giving the septic malady a fatal tendency. Each of these classes of causes may operate alone or in co-operation with another.

Under the former of these two classes of circumstances may be put the following (numbering them as they are numbered in the columns of Table II. and in Addendum A.):—

CLASS I.

Sub-class 1.

2. Unfitness of the vaccinifer for use.
3. Personal infectiveness of operator
4. Negligence in respect of avoidable precautions.

[As to 1. (Addendum A., page 155) some of them, viz., xviii., cii., and clxxxiii., cannot be considered to have had anything to do with the disease in the vaccinee.]

Sub-class 2.

7. Exposure to erysipelatous or septic infection.
9. Epidemic prevalence of erysipelas or its congeners.
10. Damage to the rising or risen vesicles, with introduction of septic contagion.
11. Some kinds of improper management.
14. The opening of vesicles on eighth day (probably in some instances).

Under the latter of the two classes of conditions may be put:—

CLASS II.

5. Unwholesome or filthy surroundings.
8. Exposure to infectious fevers, *e.g.*, scarlatina or measles.
9. Epidemic prevalence of such fevers.
10. Damage to rising or risen vesicle, either spontaneous (from abnormal tenderness as an early manifestation of mischief) or accidental.
11. Improper management or neglect.
12. Illness or delicacy of vaccinee.
13. Certain kinds of family unhealthiness and morbid tendencies or pecularities.
14. The opening of vesicles on eighth day (probably in some instances).

It is the possible and in many instances the unquestionable influence of the conditions enumerated in Class I., Sub-class 2., and in Class II., that is not in the least degree taken into account by opponents of vaccination, who habitually show a marked preference for attributing the mischief to one or other of the conditions in Class I., Sub-class 1.

The following scheme represents formally and more in detail the views held by the Medical Department of the Board as to the etiology of the accidental occurrences embraced in Group I., and more or less fully illustrated by the series of cases under consideration. The possible occasions and opportunities of mischief may be usefully arranged in order of time from vaccination onwards. Thus:—1. At the time of vaccination. 2. During the interval between vaccination and inspection. 3. At the time of inspection on the eighth day. 4. At times subsequent to the eighth day inspection. Arranged according to the nature of the opportunity or occasion, the most obvious of them may be stated as follows [The numbers 1, 2, 3, 4 in brackets have reference to the periods just enumerated when the opportunity or occasion may arise or be offered]:

1. Having relation to the vaccinee personally.

Unfitness for vaccination on account of debility or the presence of actual disease (1, 2, 3, 4).

2. Having relation to the place where the operation of vaccination is performed, or where inspection (with or without opening of pocks) takes place on eighth day.

a. At child's house or at other place than station (1, 2, 3).

e.g. Filth or atmospheric pollution.

Existence of cases of disease in house at the time, especially erysipelas, discharging sores, and infectious fevers.

b. At public vaccinating station (which is sometimes a public room, sometimes the vaccinator's private surgery, and sometimes a private house or cottage) (1 and 3).

e.g. Atmospheric pollution from nuisances of some kind.

Crowding on vaccination days from insufficient space and ventilation.

Infectiveness of room from the actual presence at the time, or recently, of cases of septic or infectious diseases, such as erysipelas, discharging sores, scarlatina, measles, &c. (very apt to occur when the vaccinator is a district medical officer and vaccinates in the room to which patients come indiscriminately, also where the place is used as a relief station for paupers).

3. Having relation to the operator (1 and 3).

a. Personal infectiveness of operator or infectiveness of his clothing.

e.g. From being in attendance at the time on cases of erysipelatous or septic maladies.

b. Negligence in respect of precautions for the avoidance of danger in vaccination.

e.g. As respects the instruments used in wounding the skin or puncturing pocks.

As respects the taking of lymph for preservation and mode of preserving lymph.

As respects the selection of vaccinifer.

As respects the operating during epidemic prevalence of erysipelas or infectious fevers, such as scarlatina or measles.

4. Having relation to the vaccinifer (human) (1). Insertion of improper lymph, whether direct from the arm or preserved.

e.g. From an unhealthy child, *i.e.*, diseased, sickly, or incubating erysipelas, &c.

From an arm in any way polluted with dirt or septic discharges.

From an arm with imperfect or inflamed (or areolated) pocks, or on which any of the pocks had been broken or burst.

5. Having relation to the morbid tendencies or peculiarities of the vaccinee's family (1, 2, 3, 4).

e.g., family susceptibility to erysipelas, &c.

Strumous tendency or general family unhealthiness.

6. Having relation to the environments of the vaccinee (1, 2, 3, 4).

a. Dirty or unwholesome local conditions in or about the house liable to introduce a septic infection.

b. Direct exposure of vaccinee to erysipelatous or septic infection.

c. Epidemic prevalence of erysipelas or its congeners in neighbourhood.

d. Direct exposure of vaccinee to the infection of eruptive fevers, *e.g.*, scarlatina and measles.

e. Epidemic prevalence of eruptive fevers in neighbourhood.

7. Having relation to the neglect of the vaccinee, to improper management of the arm, improper applications to it, &c. (1, 2, 3, 4).

8. Having relation to rupture or injury of the pocks from any cause giving favourable opportunity for the local reception of septic infections (2, 4).

[Opening of pocks on eighth day, whether as a matter of routine or for the obtaining of lymph, would appear sometimes to be the starting point of mischief. But as to this see Addendum A. Column 14, pages 173–6.]

The Addendum A. shows the number of times (page 155), that the several occasions of mischief as above are recorded in the reports and the number of cases (page 155) in which one or more of these occasions of mischief were noted.

The numbered columns referred to in Addendum A. correspond to the columns of Table II.

The Addendum B. (pages 179–196) gives similar information but more in detail.

In selecting among all the possible opportunities or occasions of mischief the cause or causes to which the fatal mischief in any individual case is attributable, the following are among the most important of the *criteria* available, viz. :—

The period (or lapse of time) after operation at which the first phenomena of the mischief become apparent.

The occurrence or non-occurrence of similar mischief: 1, among co-vaccinees, *i.e.*, among those vaccinated from the same source and mostly at the same time and under the same circumstances; 2, among subsidiary co-vaccinees, *i.e.*, among those vaccinated about the same time from different sources.

1st. As respects the period of commencement of mischief, which may be termed the "time criterion."

In Table II. and in Addendum A. a distribution of the 150 cases has been made into weeks of apparent commencement of mischief. [This distribution requires a little explanation. The ring of inflammation around the pock, known as the "areola," does not in the typical course of the vesicle, appear before the eighth day, it lasts about three days while the pock is at the full, and then fades away with the commencement of the drying-up of the pock. Occasionally, within normal limits, it may commence a trifle earlier, or it may last a day or so longer, but where the areola of inflammation commences very early, is extensive on or before the eighth day, becomes unusually extensive or severe, and lasts unusually long, the condition is abnormal and more or less morbid. It is unquestionably morbid when on or after the eighth day the inflammation spreads after the manner of erysipelas, or when other changes, such as ulcerations, occur as a sequence. Hence, in the tabulations, wherever severe inflammation, erysipelas, or ulcerations are noted as occurring in the second week, and there has been this early development in the first week of what otherwise might have been regarded as a mere somewhat early areola, I have placed the case among those which really commenced in the first week. The issue or progress of the inflammation marking the difference.*

Dr. Ballard's Memorandum.

Another early sign of mischief commencing is rupture of the young vesicle, which normally is up to the eighth day (or later) firm enough to resist all ordinary mechanical causes of injury, such as friction of clothing, pressure in bed, &c. But among careless and negligent people, found mostly in the poorer classes, a quite normal vesicle may become ruptured from too rough usage, and where subsequent mischief arises it is not always possible to distinguish between the two kinds of causes, viz: abnormal tenderness and the simple results of mechanical injury apart from abnormal tenderness. Hence I have been unable to use this condition of rupture occurring in the first week when other signs of early morbid development have been wanting, as a criterion of the commencement of morbidity. Hence too it follows that in all probability some of the cases whose commencements are tabulated in the second week really commenced with this symptom in the first week, and had the facts, been strictly ascertainable would thus have been tabulated.]

Among the 150 cases tabulated there commenced apparently—

In the first week of vaccination	-	41
,, second ,,	-	61
,, third or fourth weeks ,,	-	38 (In third week apparently 27; ,, fourth ,, - 6; ,, 3rd or 4th 5)
,, fifth week or later	-	6
At an undetermined period	-	4

Nearly all these were cases of erysipelas, simple or variously complicated, or of severe inflammation spreading from the pocks (in all but a few) and nosologically indistinguishable from erysipelas.

Of the 41 commencing the first week, 37 are to be thus regarded: two were cases of pyæmia, and two were inflamed areas with blebs round the locality.

Of the 61 commencing in the second week, 53 are to be thus regarded: one was a case of tetanus, and seven were cases of ulceration.

Of the 38 commencing in the third or fourth week, 28 are to be thus regarded: one was a case of axillary abscess, one of vesicular eruption commencing near pock, and eight were cases of ulceration with or without axillary abscess and one had erysipelas in the ninth week.

The later cases (fifth week or later) were cases of erysipelas with or without ulceration or abscess.

Thus of the 118 cases to be regarded as erysipelatous, the period of whose commencing mischief is ascertainable, only 37, or about 31 per cent., commenced in the first week, and of the rest nearly two-thirds in the second week.

The mischief in the above 15 cases of ulceration did not commence apparently before the second week. The occurrence of distinct ulceration before the eighth day seems to be very rare.

The value of the criterion of time depends upon what is known of the period which elapses between the introduction into the system of the septic contagium and the appearance of the septic disease. I think it may be said generally of all contagia capable of being introduced by more than one channel, that the period of incubation may vary amongst other things with the channel through which they are introduced, and as respects septic contagia, including that of erysipelas (which may be regarded perhaps as the type of them), more speedily when introduced directly into the tissues through a wound than when finding their way into the system by a less direct channel. Something also may depend upon the quantity, quality, or virulence of the contagium, something also upon the idiosyncracy and state of health or temporary condition of the individual invaded. Something also may depend upon the presence in the system already of some other contagium or upon its concurrent introduction, and this interference may even proceed on the one hand to the extent of one contagium absolutely inhibiting the operation of another, or on the other hand of promoting or facilitating its operation, or finally the operation of both may be reduced in freedom. This

* Where excessive inflammation or erysipelas was noted at inspection on the eighth day the case has been placed among those of the first week.

Dr. Ballard's Memorandum.

much appears capable of being gathered from Dr. Klein's observations (19th Report of the Medical Officer of the Local Government Board).

What we know about the incubation period of erysipelatous contagium in vaccination cases (which, so far as Fehleisen's observations apart from vaccination in seven instances of inoculation go, would appear normally to be when locally introduced 15 to 61 hours) is only derivable, so far as my knowledge goes, from the information I have been able to gather from inquiries and observations instituted from time to time by the Medical Department of the Board. These observations are collected together in the Addendum C., on pages 196–210.

I may enumerate and summarise them thus [I may premise that they are all instances in which there was apparently opportunity or occasion for the introduction of contagium locally either at the time of the vaccination or at the time of inspection on the eighth day, and that they include all the varieties of morbid manifestations embraced in Group I.]

1. The cases in the Table II. against which × is marked in columns 2, 3, and 4. Out of 41 of these no fewer than 21 commenced in the course of the first week of vaccination, *i.e.* before inspection on eighth day, viz.:—

1 on the 1st day.
3 ,, 2nd ,,
4 ,, 3rd, 4th or 5th day.
2 ,, 6th day.
2 ,, 7th day or earlier.
9 ,, 8th ,, ,,

It may readily be admitted that in all probability these 21 cases (or 20 if we except lxxxv.) were infected on the day of vaccination, at any rate for the purposes of the present argument.

Out of the 41 only about half as many, viz., 11, commenced their illness in the second week apparently, viz.:—

1 on the 9th day.
1 ,, 9th or 10th day.
2 ,, 10th day.
2 ,, 11th ,,
1 ,, 13th ,,
2 towards the end of the week.
2 particular day not ascertained.

Now out of all these 11 cases it cannot be so readily admitted that all received their infection at the time of their vaccination: for instance, it cannot possibly be admitted in respect of the nature of the unfitness of the vaccinifers of cxxxii. and cciv.; and in the other nine cases particulars are given (Addendum C.) that indicate that in one case, lxxxiv. (attacked on the ninth or tenth day), the infection might have been introduced really on the eighth day; in one, xxix., it might have been introduced at any time during the first or second week before the tenth day; in one, xxii., any time between the seventh and 11th day, in two, clxvi. and xxxiv., in the course of the second week, and in the remaining cases at any time from the day of vaccination till the commencement of the illness.

Out of the 41 cases there were but seven which commenced in the third week, and with these a similar difficulty occurs as to accepting them—any of them—as really due to infection received on the day of vaccination. It seems just as probable, and indeed more so, that it was received at a later period. The probable occasions of reception of the contagium are sufficiently indicated in the Addenda A. and B.

So that after all the only cases which appear to me fitted for use in assisting the determination of this question are the first 21 on the list, in all of which cases the mischief commenced apparently in the first week. The selection of these as test cases appear to receive confirmation from the observation that—

among these 21 cases there were eight in which co-vaccinees are known to have suffered, and 13 in which subsidiary co-vaccinees* are known to have suffered; while

among the whole of the 18 cases commencing in the second and third weeks, there were only three in which co-vaccinees were known to have suffered, and there were only two in which subsidiary co-vaccinees are known to have suffered. *See* further remarks in Addendum C.

2. The cases in Table II., against which × is marked in column 10, and Addendum A., on pages 147–155 (see also Addendum C., page 196). These are cases in which, from one cause or another, the vesicles became injured so as to cause a readily receptive spot for any casual infection.

Out of 48 of these—
16 commenced in the first week.
17 ,, ,, second ,,
9 ,, ,, third ,,
3 ,, ,, fourth ,,
2 ,, ,, fifth ,, or later.

The dates when the injuries or burstings occurred are given in Addendum A., page 166. Assuming that these were the dates on which septic infection was received—and it might in some cases have been earlier from a different occasion, or later—the following results come out, viz.:—

a. That in 27 cases in which the injury occurred in the first week—
the mischief commenced in the first week in 16, viz.:—
,, ,, ,, second ,, 8
,, ,, ,, third ,, 3; none later.

b. That in 11 cases in which the injury occurred in the second week, or perhaps later—
the mischief commenced in the second week in 10.
,, ,, ,, third ,, 1 only.

c. That in three cases in which the injury occurred in the third week—
the mischief commenced in the third week in all 3.

d. That in four cases in which the injury occurred in the fourth week, or perhaps later—
the mischief commenced in the fourth week in 3.
,, ,, ,, fifth ,, 1.

e. That in one case in which the injury occurred in the fifth week—
the mischief commenced in the same week.

On the assumption mention above, the indication again is that, as a rule, the incubation period did not extend beyond a week, and in many cases only a few days. Of course the analysis might be carried further, but there does not seem to be occasion for it, especially as more detailed particulars are to found in Addenda A. and C.

3. The cases in Tabulation II., against which × is marked in column 11, and Addendum A. These are cases in which improper management or applications (some dangerous) or serious neglect are reported.

Out of 50 such cases—
8 commenced with mischief in the first week (in four of which xviii., xxxv., xxvii., and cxviii., this circumstance could only have acted in aggravation of some other).
21 commenced with mischief in the second week.
14 ,, ,, ,, third ,,
4 ,, ,, ,, fourth ,,
2 ,, ,, ,, fifth ,, or later.

The dates at which these several occurrences took place or commenced are given in Addendum A. on page 168.

Making a similar assumption to that in the last series of cases (2), somewhat similar results come out.

See also Addendum C.

4. Nineteen cases of erysipelas, of which five died, that occurred in a public vaccinator's practice at Warrington in 1871, among children vaccinated on five several vaccination days, mostly by an unqualified assistant.

Assuming that all the cases were infected on the day of vaccination, the illness commenced in the first week in 13 of them, viz.:—

On the 2nd day in 1.
On the 2nd or 3rd ,, 1.
On the 3rd ,, 1.
,, 4th ,, 2.
,, 7th ,, 1.
Some time before 8th day 7.

Illness commenced in the second week in five, viz:—

On the 9th day in 2.
,, 10th ,, 1.
,, 11th ,, 1.
After inspection on 8th day 1.

* By subsidiary co-vaccinees are meant individuals vaccinated by the same person about the same time, but not from the same source.

But it is not improbable that these five cases whose illness commenced in the second week obtained their infection on the day of inspection, and not on the day of vaccination (in which case the incubation periods would be, not eight, nine, or ten days, but one to three days), since cases of erysipelas were present at the station on the inspection days, and three out of the five actually had their pocks opened with the obviously infected vaccinating instrument. For further particulars of this series of cases, *see* Addendum C., page 203.

5. In a series of 14 cases of erysipelas and other abnormalities that occurred at Redruth in 1889 (the vaccinator, more or less demented, being thoroughly reckless), there were three cases in which the dates of commencement of the mischief were ascertained. Two of these three cases were Numbers c. and ci. in the tables, and they are included among the cases referred to previously, and which was made the subject of complaint. In one case (c) the vaccinated spots were red and looked irritated on the second day, the arm was inflamed on the fifth day, the pocks were punctured on the eighth day, and then the erysipelas extended with ulceration and axillary abscess. In ci. there was extensive erysipelas by the eighth day. In the third case, which was not a fatal one, the first symptoms commenced on the first day a few hours only after vaccination, and there was severe inflammation, diffuse cellulitis and abscess in the elbow in the first week.

6. In a series of six cases which occurred in Thingoe Union in 1889 in connexion apparently with a personal infectiveness of the operator, five were erysipelatous (the sixth case being one of axillary abscess). Of these five Nos. lxxxiii., lxxxiv., lxxxv., were fatal; the remaining two cases that recovered both commenced illness on eighth day, *i.e.* seven days after vaccination, but there is reason to believe that they might have received their infection on the day of their inspection, not on the day of their vaccination (*See* Addendum C., page 199).

[See also in same place reasons for thinking that lxxxiv. and lxxxv. might also really have received their infection on the day of inspection].

7. In a series of 26 vaccinations performed at Henstead under circumstances in the most marked degree calculated to produce mischief in the act of vaccination by a reckless vaccinator, and in which in every instance erysipelatous and other allied affections ensued, there were two fatal cases already counted in among the tabulated allegations, viz.: Nos. cvii. and cvii.*a*. There were in addition 24 non-fatal cases. The dates (after vaccination) of the 26 cases altogether, and of the first appearance of the leading local phenomena, are given in Addendum C., page 200. The result of this special tabulation is remarkable and very instructive. The first indication of mischief, whether it were inflammation or breaking down of the rising vesicle or papule, occurred (so far as could be ascertained)

On the	1st day, (that of vaccination)	in 4 instances,
,,	2nd	5
,,	3rd	6
,,	4th	2
,,	5th	3
,,	6th	0
,,	7th	0
,,	8th	2
,,	9th	2
,,	10th	1
		25

Thus out of 25 instances in which the date of commencement of local mischief was ascertainable, it commenced—

In the	first week (and before the 6th day)	in	20
,,	second ,,	,,	5

Now it is important to note that in the day record of commencement above, there is a remarkable gap of two days on which none of the cases commenced, viz.: the sixth and the seventh day, but after that there were two cases commenced on the eighth day, that of inspection, two cases on the ninth day, the day after inspection, and one on the tenth day, the day but one after inspection.

With such a day record as the above, I think it may be fairly argued that these five late cases escaped infection on the day of vaccination, but received it on the eighth day when a number of children with erysipelatous arms were present at the station. The probability that this was so is increased by noting that one of the five had burst or broken vesicles when presented for inspection, and two of them were specially exposed to receive infection by being on that day manipulated (vesicles opened and used) by the reckless operator. For further details, *see* Addendum C., page 200.

8. A series of ten cases of erysipelatous mischief among a series of 18 vaccinations performed at Clerkenwell in 1879 from one vaccinifer under circumstances that lead to the belief that the infection was imparted on the day and at the time of the vaccination. Of these ten cases, four died. *See* Addendum C., pages 200 and 206.

The first indications of illness in all ten cases appeared in the course of the first week. In eight of the ten, the day of commencing illness was ascertained, viz.:—

Illness commenced	on the	1st day	in 4	instances.
,,	,,	2nd ,,	2	,,
,,	,,	5th ,,	2	,,

9. A series of three children vaccinated at Blandford in 1883 from the same source by a careless vaccinator. They were the only children vaccinated (two arm to arm, and one from a tube). In all three cases extensive erysipelas commenced about the second or third day, at any rate early in first week. There can be no doubt that the infection was received at the time of vaccination. For further details, *see* Addendum C., page 206.

10. In 1871, tube lymph from one source was supplied from the N.V.E. to three several practitioners in different parts of the country and used by them for the vaccination of ten children. The lymph was from a child, whose arm, according to the statement of the vaccinator, was a very fine one, and as to which he further stated that "the flow of lymph was ample and rapid" (? too much so). But by the 13th day it had become inflamed to the elbow. The lymph, anyhow, proved to be in some way infective. No account was obtainable in respect of three of these ten children; in one of them only a single pock rose. As to the other six, in three cases the pocks came rapidly to a head and burst, but the dates are not stated; in the other three, more or less severe inflammation occurred, commencing on second or third day in each.

11. A series of three vaccinations where septic mischief occurred in connection with the use of lymph of apparently irritating quality. One of them was case No. cxi. in the tabulated fatal cases. The other two cases had severe inflammation with other phenomena. All three children were vaccinated at the same place on the same day. On the 8th day cxi. was found to have broken vesicles (an abnormality which might have been due to a morbid tenderness), on the 10th day there was inflammation with eczema on the cheek which extended, and the child died. In another (not fatal) case there were on the 2nd day broken pupules at the vaccinated spots which were followed by redness and erysipelas, and on the 7th day there were small blebs round the vesicles. In the third case (also not fatal) there were broken papules and raw surfaces, and subsequently inflammation and blebs round the pocks, the discharges from which infected a sister. In both cases the mischief commenced on the second day.

Six additional series of accidents summarised from some old records of inquiries made by the Board, viz., at Appleby, Blandford, Sudbury, Plomesgate, Stoke Newington, and Chelsea, are placed in Addendum C.

The general inference to be drawn from these facts and the additional facts recorded in Addendum C., appears to be that in nearly all instances where the time of local introduction of septic contagium can be ascertained, the first appearance of mischief is observed before the expiration of one week, and in a notable proportion of cases during the first three or four days from its introduction. Hence, that in estimating the influence of several possible causes of mischief in any particular instance, it is quite justifiable to use this "criterion of time" as counted from the day of vaccination or from that of opportunity or occasion of local infection, as for example from the day of inspection in certain cases. Where this period of time is exceeded (and the longer it is exceeded) the probability is that other circumstances than local introduction of a contagium were concerned in producing the mischief.

Dr. Ballard's Memorandum.

Applying the "time criterion" to the several columns of circumstances as summarised in Addendum A., the result is as follows:—

	Illness commenced in the following weeks after Vaccination.				
	First Week.	Second Week.	Third Week.	Fourth Week.	Fifth Week or Later.
Among 40 cases where circumstances referred to in cols. 1 to 4 were ascertained, and the date of commencing illness was known.	21 or 52·5%	12 or 30·0%	7 or 17·5%	—	—
„ 59 cases in col. 5 where the date of commencing illness was known.	14 „ 23·7%	28 „ 47·5%	11 „ 18·6%	3 or 5·1%	3 or 5·1%
„ 30 „ 6 „ „	9 „ 30·0%	14 „ 46·7%	6 „ 20·0%	1 „ 3·3%	—
„ 15 „ 7 „ „	7 „ 46·7%	4 „ 26·7%	3 „ 20·0%	1 „ 6·7%	—
„ 9 „ 8 „ „	4 „ 44·4%	1 „ 11·1%	4 „ 44·4%	—	—
„ 27 „ 9 „ „	9 „ 33·3%	12 „ 44·4%	4 „ 14·8%	1 „ 3·7%	1 „ 3·7%
„ 47 „ 10 „ „	16 „ 34·0%	17 „ 36·2%	9 „ 19·1%	3 „ 6·4%	2 „ 4·3%
„ 49 „ 11 „ „	8 „ 16·3%	21 „ 43·0%	14 „ 38·6%	4 „ 8·2%	2 „ 4·1%
„ 24 „ 12 „ „	3 „ 12·5%	13 „ 54·2%	7 „ 29·2%	—	1 „ 4·2%
„ 42 „ 13 „ „	13 „ 31·0%	18 „ 42·9%	9 „ 21·4%	1 „ 2·4%	1 „ 2·4%
„ 46 „ 14 „ „	8 „ 17·4%	23 „ 50·0%	11 „ 23·9%	1 „ 2·2%	3 „ 6·5%

Some further observations must be made in respect of the above figures and per-centages.

As respects the first group of 40 cases where, either at the time of vaccination or of inspection (with or without opening of the vesicles) opportunities for infection were apparently afforded either from abnormality or unfitness of the vaccinifer, personal infectiveness of the operator, or neglect of proper precautions in operating (including instances where the operator was known to be habitually careless), it is to be noted that in more than half the mischief to the vaccinee commenced in the course of the first week. In 12 cases, however, it did not commence until the second week, i.e., after the eighth day inspection, and in seven not until the third week. In none of them did it commence later. The 12 cases commencing in the second week did not all necessarily receive their infection locally at the time of vaccination. Nor did the seven cases which commenced in the third week. Thus:—

xxii. Might have received infection when the vesicle became broken on the seventh day or subsequently, and not from the vaccinifer at all.

xxix. (Who was ill when vaccinated) probably got infected from the ulcerated legs of the mother more probably than from the vaccinifer, whose only unfitness was the presence of some impetigo, or through the conjoint operation of the numerous other circumstances noted as attending the progress of the vaccinia.

cxx. Did not really commence with erysipelas until the third week, and this element of the illness might have been due to other causes than those existing on the day of vaccination. It was an axillary abscess that appeared in the second week, and the erysipelas began about the abscess and not about the pocks.

cxxxii. The unfitness of the vaccinifer in this case was not of a character to produce the local mischief at the vaccinated spots. Other causes referred to were probably the efficient ones.

cciv. A similar remark applies to this case: the arm was normal and the vaccinifer only unfit merely because puny.

lxxxiv. There is a doubt in this case as to the day on which the child received the infection—it might have been on the inspection day, in which case the incubation would have been only one or two days (Addendum A., page 199).

cxxxiv. It is quite as likely and, indeed, more so, that this child got erysipelas directly from visiting at a certain house as by agency of the vaccinator.

clxxiv. This child on eighth day, the pocks having been injured, might have acquired infection not at vaccination, but on inspection day, in which case the incubation period would have been not eight days but one day.

clxxxv. The precise day on which erysipelas commenced is not stated in report. It might have been on or before eighth day, and incubation therefore have been less than one week.

clxvi. This child, said to have been attacked on ninth day, may have really been infected by careless vaccinator when vesicles were opened on eighth day, or by other casual means mentioned.

xxxiv. It is, of course, possible that this child, said to have been attacked with erysipelas on the 13th day, acquired infection when vaccinated, but there is no certainty that it was not a casual infection acquired subsequently.

cxxiii. It is doubtful whether the vaccinifer was infective at all when used, his arm on eighth day not being inflamed.

Then also as regards the remaining seven cases, whose illness commenced in the third week:—

lx. This was not a case of erysipelas, but of sloughing ulceration. The history seems more to indicate that the vaccinifer's mother, who had mammary abscess, might somehow have polluted with septic discharge the pocks on her child's arm, as a result of which both lx. and her co-vaccinee, as well as the vaccinifer herself, became infected when the vesicles were opened and used.

cxxix. The only reason for putting this case on the list of column 2 was the unhealthiness of the vaccinee's family, and the child was weak through illness when vaccinated. It was not a case of erysipelas, but of ulceration.

clvi. Again the unfitness of the vaccinifer was the general filthiness of the family from which it was brought. There is no reason for supposing that the erysipelas in ninth week not commencing about pocks was due to the vaccinifer, other causes being sufficient to account for it.

cxciv. There is no reason for supposing that the excess of areola in vaccinifer had anything to do with the general vesicular eruptions that cxciv. suffered from. The cause of the illness was far more probably some constitutional peculiarity in the child herself.

clxxiii. There is no reason to believe that the vaccinifer in this particular case was anything but normal, and there was abundant cause for the late development of the erysipelas.

clxix. The cause here was very evidently applied in the course of the week that illness commenced in.

clxvii. The fault of the operator (although noted) is too far fetched to be attributed as a cause of the erysipelas. It is far more likely that septic matter on the child's sleeve was the cause of the illness which commenced late.

The history of these 19 cases then by no means invalidates the view that a local infection introduced at the vaccinated spot operates within the space of one week. It rather confirms it.

If this be admitted it may be fairly held that 21 cases are all of the 150 in which there is adequate ground for holding that the disease from which the children

died might have been occasioned by a septic poison introduced in the act of vaccination.

From which it follows further that in the remaining cases, after deducting those four in which the date of commencement of illness is uncertain (viz., lix, cx, cliv, and clxxix), that is in 129 cases, the cause of the illness was most probably a casual infection acquired either at the time of inspection or through the agency of one or more of the circumstances tabulated in columns 5 to 14.

Of the 59 cases* in column 5 where unwholesome conditions at home specially enumerated in Addendum B., on pages 182–3, were calculated to produce or promote the occurrence of septic mischief, that mischief mostly commenced after the expiration of the first week and chiefly in the course of the second week. Of the 14 cases in which the mischief, commenced in the course of the first week, six, or nearly half were associated with circumstances tabulated in columns 1 to 4.

It may be taken, therefore, that this kind of influence operates usually later than the first week and in more than a fourth of the cases later even than the second week.

Of the 30 cases in column 6 where exposure had been had to erysipelatous or septic infection, the occasions of which are specially enumerated in Addendum B., page 184, the mischief again commenced mostly after the first week and chiefly in the course of the second week. None of the nine cases in which it commenced in the first week was associated with the circumstances tabulated in columns 1 to 4. From which it may be inferred that such exposure may operate within the first week, but that it mostly operates at a later period.

Of the 15 cases in column 7 where the possible exposure to erysipelatous or allied affections was less definite, the occasions of which are specially mentioned in Addendum B., page 185, nearly half commenced in the course of the first week and all but one of the rest in the course of the second or third week. Of the seven where the illness commenced in the first week, four had been exposed to the conditions enumerated in columns 1 to 4, and another to more direct infection at home. The total number (15 cases) dealt with is small, but the indication, so far as it goes, taking the just above-mentioned fact into consideration, is that this less definite source of mischief mostly operates after the first week, in the same way as the more definite exposure referred to in column 5.

The nine cases in column 8 were nearly all instances of exposure to the infection of measles either on the day of vaccination or subsequently (*See* Addendum B., page 186), one was exposure to scarlatina and one a suspicious instance of exposure to the infection of diphtheria. Such exposure, save where an attack of measles does not actually follow, seems to favour the operation of septic causes of disease, and this at any period after vaccination so far as these few cases indicate.

The 27 cases in column 9 (page 187) were instances of mischief, mostly erysipelatous, occurring during prevalence in the neighbourhood of well known and common epidemic diseases, either scarlatina, measles, diphtheria or enteric fever, or of more than one of them at the same time. There is abundant evidence of the danger of performing vaccinations during periods of such prevalence. In one-third of these 27 cases the septic disease, towards which this prevalence predisposes vaccinees, commenced in the first week, but the larger number in the second week. Of the nine in which illness commenced in the first week no fewer than six had been exposed to influences tabulated in columns 1 to 4, and another of these (cl.) might have been infected directly from the mother's ailment. So here, too (as with the cases enumerated in column 7), the indication is that the mischief led up to by this cause mostly shows itself after the first week.

The 47 cases of septic mischief, principally erysipelatous, which occurred after rupture of the vesicles or the rising pocks (Column 10), require some special remarks. In itself this accident is not directly the cause of the mischief, but whenever it happens it lays the spot open abnormally to the introduction of septic contagium, either directly from the agent by which the actual rupture is effected or from other casual sources.

In most, if not in all instances, the rupture itself is brought about by some mechanical cause, such as friction of the clothing, rough usage, or improper local applications. But a pock as it rises in the first week it normally firm enough to resist all ordinary friction from clothing, and mothers are usually careful not to injure it while manipulating the child. When, therefore, it occurs early, some cause additional to mechanical injury comes to be suspected, that being abnormal delicacy or tenderness of the tissue, which is often one of the earliest symptoms of mischief that will subsequently develop into erysipelas or ulceration. But as it is often impossible in individual cases to gauge the amount of mechanical interference, it has been necessary in the tabulating of these cases to group all kinds of injury and rupture together. An attempt has been made in Addendum B., pages 188–9, to indicate the probable influence of these two kinds of cause of rupture separately, and in Addendum A., page 166, the date, either actual or approximative, at which the rupture occurred, is entered against each case. It is the doubt respecting the amount of the mechanical element in the rupture which has excluded this early symptom of disease from use, in estimating the time after vaccination at which the septic mischief commenced in the cases under consideration. *Dr. Ballard's Memorandum.*

What is noticeable is this, that in 70 per cent. of the instances in which the vesicles or rising pocks were injured by way of rupture, the first (other) indication of septic mischief was observed in the course of the first or second week, being about equally distributed between these weeks. It is further to be noted that among 16 of the cases where illness commenced in the first week, there were seven in which conditions referred to in columns 1 to 4 might also have operated; there were three additional in which there had been direct exposure to the chance of erysipelatous or septic infection, and one additional where erysipelas was prevailing in the neighbourhood; in another case there was a family susceptibility to erysipelas; and in two other cases most unwholesome conditions about the house. The connection between the injury to the pock and the fatal septic mischief, in these 47 cases, appears also when the approximative dates of the injury and of the commencement of the septic disease are noted. Thus in 26 cases where the injury had occurred by the eighth day, *i.e.*, in the course of the first week, the earliest (other) indication of the fatal disease occurred also in the first week in 16, in the second week 7, and in the third week in 3; in 11 cases where the injury had occurred in the course of the second week the earliest indications of disease appeared in the second week in 9, and in the course of the third week in 2; in three cases where the injury had occurred in the course of the third week, the first appearance of disease was observed in that week, while in five other cases of later injury the disease made its first appearance in the week of injury. *See* further on this subject, Addendum C.

Of the 49 cases in column 11, in which there had been obvious neglect or improper management of one kind or another, the septic mischief presented its first indications in the large majority (81 per cent.) either in the second or third week. Addendum B., pages 190–1, shows the particular sort of mismanagement to which each child was subjected. It is not usually before the pocks have fairly risen and the areola begins to appear that mothers begin to meddle injuriously with the child's arm; but then to allay, as they suppose, inflammation, or in accordance with some popular tradition, they often do so, putting on a shield either clean or dirty and infectious, poulticing or applying rags, not always very clean, smeared with a variety of substances, or rubbing on these substances with fingers not over clean perhaps, &c. By these means it often happens that the pocks are injured, or some septic contagium is also introduced. It is noticeable how large a proportion of ulcerative cases occur in this column. Addendum A., pages 168–9, exhibits in each case the period of the case at which the mismanagement commenced, and when apparently the first symptoms of illness appeared.

Column 12 relates to delicacy of health or actual illness of the vaccinee at the time of vaccination. Such circumstances obviously favour abnormality in the course of vaccinia. Out of the 24 cases of septic mischief in column 12 in which they were noted, the illness commenced in 20 of them in either the second or third week, but principally in the second week. Two out of the three cases that commenced in the first week

* Here as in respect of subsequent columns referred to only those cases are counted in which the date of commencement of the illness is known.

Dr. Ballard's Memorandum.

were associated with circumstances included in columns one to four. It is then at the time when the pocks are arriving at maturity and before the fall of the crusts that the unfavourable influence of ill-health in the vaccinee appears to manifest itself most decidedly in the group of cases under observation. The varied conditions of ill-health in the several cases in the column are exhibited in Addendum B., page 192.

The 42 cases in column 13, the date of whose commencing illness is known, are of a very mixed character as respects the health conditions of the families in which they occurred, as will appear by referring to Addendum B., pages 193–4. The health conditions referred to embrace not only chronic states of ill-health in the family generally, or in individual members of it, and various morbid tendencies discovered by inquiry, but some more acute illnesses at or about the time of the child's vaccination. So far as these circumstances are promotive of septic mischief they appear to show their unfavourable influence chiefly in the first two weeks, but principally in the second week. Three of the 13 cases, whose illness commenced in the first week, were associated with circumstances enumerated in columns one to four.

It is an interesting question whether puncture of the vesicles on the eighth day is conducive to the subsequent occurrence of septic disease by opening the way to casual infection, and the more so because, while it is a necessary element in arm-to-arm vaccination, it is the practice of some vaccinators to do it (mainly, I take it, to meet some prejudice of parents) when the lymph is not required for use. *Primâ facie* one would judge that it is a dangerous practice, not to be adopted unnecessarily; and it was mainly to test this that the column 14 has been introduced into the tabulations. And to assist in this inquiry columns have been introduced into Addendum A., page 173, which permit of cases where the vesicles were punctured being compared with cases in which it is stated that the vesicles were not punctured on the eighth day. Of the cases that were punctured there were 46, and of those that were not punctured there were 59, and of these latter there were 57 in which the date of commencing illness was ascertained. But as this possible cause of mischief could only have to do with illness commencing after the eighth day (except in so far as it might have been concerned in exasperating mischief already set up) comparison has at first to be limited to cases which commenced in the second and subsequent weeks.

Now it is remarkable that the proportion of cases of disease which had their commencement in the second, third, and later weeks respectively is pretty nearly the same in the two categories, which would appear to indicate that the puncture of the vesicles does not in itself lay the subject more open to fatal septic mischief from casual causes generally than leaving them alone.

At the same time there is a suggestion that in a degree puncture favours and hastens the morbific operation of *direct* erysipelatous or septic infection, *i.e.*, the circumstances noted in Column 6. Among the 38 cases of illness (Addendum A., pages 173–6) succeeding puncture of the vesicles that commenced after the first week, there were eight in which such exposure to direct infection had occurred, and six of these illnesses commenced in the second week, and only two in the third week. On the other hand, among 35 cases of illness where the pocks were not punctured, there were five where such direct exposure to infection had occurred, and of these the illness commenced in the second week in two cases and in the third week in three. Clearly too the puncture of the vesicles on the eighth day does not seem directly to promote the ulcerative process. But however all this may be the practice adopted by some vaccinators of puncturing the vesicles almost as a matter of routine on the eighth day, when lymph is not required for use, or to satisfy the fancy of an ignorant mother, can do no possible good, may indirectly if not directly be harmful and ought consequently to be discouraged or prohibited.

Secondly, less need be said in justification of the other *criterion* alluded to above, viz., the occurrence of mischief among co-vaccinees and subsidiary co-vaccinees. It stands to reason that where circumstances one to four in Table II. have been operative causes, the probability of mischief among co-vaccinees and subsidiary co-vaccinees is much greater than where the conditions 5 to 14 were the operative and efficient cause of the mischief among the vaccinees. And that this really was so appears from the analyses of the cases in each column as set forth in Addendum A.

Thus as to co-vaccinees, where such are mentioned in the reports.

As to	25	cases in cols.	1, 2, 3, 4,	they were normal in	13 or 52	p.c.,	and suffered more or less in	12 or 48	p.c.
,,	44	,,	col. 5	,, ,,	39 or 88·6	,,	,, ,,	5 or 11·4	,,
,,	22	,,	,, 6	,, ,,	17 or 77·3	,,	,, ,,	5 or 22·7	,,
,,	9	,,	,, 7	,, ,,	8 or 88·8	,,	,, ,,	1 or 11·1	,,
,,	7	,,	,, 8	,, ,,	4 or 57·1	,,	,, ,,	3 or 42·8	,,
,,	20	,,	,, 9	,, ,,	14 or 70·0	,,	,, ,,	6 or 30·0	,,
,,	37	,,	,, 10	,, ,,	29 or 78·4	,,	,, ,,	8 or 21·6	,,
,,	31	,,	,, 11	,, ,,	27 or 87·1	,,	,, ,,	4 or 12·9	,,
,,	21	,,	,, 12	,, ,,	19 or 90·5	,,	,, ,,	2 or 9·5	,,
,,	31	,,	,, 13	,, ,,	28 or 90·3	,,	,, ,,	3 or 9·7	,,
,,	34	,,	,, 14	,, ,,	28 or 82·4	,,	,, ,,	6 or 17·6	,,

[As respects Columns 7 and 8 the total cases are too few for any stress to be laid on them.]

And at pages 159–176 of Addendum A. it is shown how very frequently the occurrence of mischief among the co-vaccinees of the cases in each column from 5 onwards was associated with the occasions or opportunities afforded under columns 1 to 4.

Thus among the 5 instances of mischief to co-vaccinees in column 5 there were 4 cases of this kind.

,,	,, 5	,,	,,	,,	6	,,	2	,,	,,
,,	,, 1	,,	,,	,,	7	,,	1	,,	,,
,,	,, 3	,,	,,	,,	8	,,	0	,,	,,
,,	,, 6	,,	,,	,,	9	,,	4	,,	,,
,,	,, 8	,,	,,	,,	10	,,	5	,,	,,
,,	,, 4	,,	,,	,,	11	,,	1	,,	,,
,,	,, 2	,,	,,	,,	12	,,	0	,,	,,
,,	,, 3	,,	,,	,,	13	,,	0	,,	,,
,,	,, 6	,,	,,	,,	14	,,	3	,,	,,

Thus again, as regards subsidiary co-vaccinees (*i.e.*, persons vaccinated about the same time, but from a different source).

Among the 42 cases in cols. 1, 2, 3, 4, together subsidiary co-vaccinees are mentioned as suffering more or less in					17 or 40·5 per. cent.
,,	62	,,	5	7 or 11·3	,,
,,	30	,,	6 (exposure to erysipelas or septic infection)	2 or 6·6	,,
,,	15	,,	7 (prevalence of erysipelas)	2 or 13·3	,,
,,	9	,,	8	1 or 11·1	,,
,,	27	,,	9 (prevalence of infectious fevers)	5 or 18·5	,,
,,	48*	,,	10	10 or 20·8	,,
,,	50	,,	11	5 or 10·0	,,
,,	27	,,	12	3 or 11·1	,,
,,	43	,,	13	4 or 9·3	,,
,,	46	,,	14	5 or 10·9	,,

* Rupture of vesicles, it is recollected, may mean a tenderness, the first evidence of coming mischief.

And at pages 159–176 of Addendum A. is shown the great frequency with which the occurrence of mischief among these subsidiary co-vaccinees in each column from 5 onwards was associated with opportunities of mischief from the circumstances of columns 1 to 4.

Thus among the 7 instances of mischief to subsidiary co-vaccinees in col. 5 there were 6 instances of this kind.

,,	,,	2	,,	,,	,,	6	,,	1	,,	,,
,,	,,	2	,,	,,	,,	7	,,	1	,,	,,
,,	,,	1	,,	,,	,,	8	,,	0	,,	,,
,,	,,	5	,,	,,	,,	9	,,	5	,,	,,
,,	,,	10	,,	,,	,,	10	,,	8	,,	,,
,,	,,	5	,,	,,	,,	11	,,	2	,,	,,
,,	,,	3	,,	,,	,,	12	,,	3	,,	,,
,,	,,	4	,,	,,	,,	13	,,	2	,,	,,
,,	,,	5	,,	,,	,,	14	,,	4	,,	,,

Applying the foregoing remarks to the several cases in Group I. of the Analytical Table I., the following of their origin may be adopted:—

Case x. There is no reason to suspect that anything directly associated with the act of vaccination had to do with the child's illness. She belonged to a weakly family, a circumstance which will assist in explaining the abnormality in the progress of the pocks. Tetanus is a condition which occasionally follows very slight wounds or injuries, and has a specific cause which has no relation to vaccine virus.

xii. There is no reason for suspecting anything associated with the act of vaccination to have been concerned in the illness. The mechanical injury to the vesicles believed to have been inflicted on the sixth day in a delicate child improperly fed and neglected is quite sufficient to account for it. The child actually died from diarrhœa, which was prevalent at the time.

xv. There is nothing to indicate that the illness arose out of anything associated with the act of vaccination, notwithstanding its apparent commencement with inflammation in the first week. Both vaccinifer and co-vaccinees passed through their vaccinia normally. The foul home of the child, who belonged to an unhealthy family, had probably most to do with the erysipelas.

xvi. There was perhaps something wrong at the station. This might account for the illness of the P.V. and other abnormalities among vaccinees about the same time.

xvii. There is nothing to indicate anything amiss with the occurrences at the station at time of vaccination. The unwholesome surroundings at home and the prevalence of sore throats in the family were quite sufficient to account for even an early attack of erysipelas.

xviii. The vaccinifer's eczema two months after vaccination could have had nothing to do with the vaccinee's illness, which was, perhaps (as well as the irregular results observed in some other attendants at the station), due in part to exposure to infection of measles favouring the operation of some casual cause to which the broken vesicles a few days after vaccination gave ready access.

xix. The condition taken on by the pocks appears to be sufficiently accounted for by the offensive unwholesome surroundings of the home.

xx. Some casual erysipelatous infection must have been in operation here. Perhaps the local applications had to do with it. But it is to be observed that diphtheria was prevalent, and there had been some rash (rotheln?) on a brother of the vaccinee. At any rate it is clear that no circumstances connected with the act of vaccination had anything to do with the erysipelas.

xxi. Evidently the circumstances of the act of vaccination had nothing to do with the illness. Erysipelas was prevalent in the neighbourhood, and the child's grandmother might have been actually the source of infection, the scabs having become rubbed off.

xxii. It is unsafe to vaccinate from an unbroken vesicle where there is one vesicle broken on the arm, first because the bursting may be the result of an abnormal tenderness, and secondly because it is impossible to be sure that some discharge with septic qualities may not have polluted the surface of the unbroken pock used. In this case, however, it is probable that the injury to the pock on the seventh day opened the way to some casual source of contamination.

xxiii. There is no reason to refer the illness to any of the circumstances attending the act of vaccination. The needless puncturing of the pocks on the eighth day assisted in laying the arm open to any casual infection.

xxiv. There is no ground for supposing that any circumstance attending the act of vaccination was concerned in the illness. There seems to have been some family susceptibility to erysipelas. The pocks had become injured in the course of the first week, and the child thus laid specially open to casual infection. The mother, too, was ill with "a cold," a condition which, in her case, was apt to be associated with erysipelatous symptoms.

xxv. There appears no reason for suspecting any circumstance associated with the act of vaccination to have been concerned in the illness. There was some febrile ailment among other members of the family, and the mismanagement and injury to the vesicles with improper applications used would appear to have had most to do with the mischief that followed.

xxvi. The information in this case is too imperfect to allow of determining the cause of the erysipelas. As it did not commence before the tenth day (and then not about the pocks), it is improbable that the act of vaccination had anything to do with it.

xxvii. It is not unlikely that the cause of the mischief was introduced at the time of vaccination; but there was obviously sufficient unwholesomeness at home in the way of general dirtiness in conjunction with the presence of a sick child having discharging sinuses to account for the occurrence of septic disease in the vaccinee.

xxviii. The cause of the erysipelas in this case is not clear. There can be little question that the course of the vaccinia was normal up to the eighth day, but that a few days after the vesicles had been punctured the arm from some cause became irritated, and much later on decidedly erysipelatous. This is not the sort of history pertaining to a case in which the erysipelatous contagium is introduced at the time of vaccination.

xxix. There is no reason to believe that the contagium of erysipelas was conveyed in the act of vaccination. But a child ill at the time with thrush ought not to have been vaccinated. The dirtiness and unwholesomeness of the home and the condition of the mother, appear to have furnished abundant opportunities for infection, the improper applications used probably serving to aggravate the mischief.

xxx. There is nothing here to indicate the introduction of contagium in the act of vaccination. Scarlatina was prevalent, and the sanitary conditions of the home not unexceptionable.

xxxi. There can be no doubt that in this case the mischief was caused by the infective quality of the lymph used in the vaccination.

xxxii. There is nothing to indicate that mischief arose out of any of the circumstances pertaining to the act of vaccination. The unwholesomeness of the home and the chances of infection from the discharges of a case of compound fracture, which the mother was attending to at the time that xxcii. was passing through her vaccinia, appear sufficient to account for the illness.

xxxiii. There is surely no occasion in this case to go back to the act of vaccination for the origin

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of the illness. Filth and direct infection were obvious and sufficient causes.

xxxiv. The infection was probably in this case either imparted when the pock was punctured on the eighth day or casually introduced afterwards.

xxxv. There can be little doubt that the mischief was done at the time of vaccination. Subsequent mismanagement probably aggravated the induced condition.

xxxvii. Probably due to some casual infection. There is nothing to indicate that the erysipelatous contagium was received at the time of vaccination.

xxxviii. There is no reason for attributing the illness to anything associated with the act of vaccination. The injury to the pocks and the chance of septic infection from the mother, conjoined with the mal-nutrition of the child, appear quite competent to account for it.

xxxix. The illness in this case appears sufficiently accounted for by dirtiness, neglect, and bad management.

xl. There were ample opportunities for septic infection in this case, first at the time of vaccination with old points, and subsequently from the use of a shield often used before; to say nothing of the prevalence of erysipelas and puerperal septicæmia in the neighbourhood and the dirtiness of the home.

xli. The very late period at which abnormality commenced, and the normal progress of the vaccinia in co-vaccinees, absolve the lymph as a cause of the illness. There was probably some casual septic infection. The scabbing vesicles appear to have been somehow injured, and the erysipelas appears to have commenced very shortly after improper dressings.

xlii. Evidently due to some casual septic infection, for which there appears to have been abundant opportunity.

xliii. There is some doubt whether bronchitis preceded or followed erysipelas, but it is incredible that the latter occurred (even by the 23rd day) as the effect of anything associated with the act of vaccination. The arm appears to have healed completely before the child was taken ill.

xliv. There is no reason for suspecting that anything associated with the act of vaccination had to do with the illness. Some casual infection after the opening of the vesicles was probably concerned in it.

lii. There is no reason for suspecting that anything associated with the act of vaccination was concerned in the illness. Injury to the pocks in the fourth week and improper treatment, with the chance of septic infection through the agency of the mother, appear quite sufficient to account for the illness in an unhealthy child whose surroundings were foul and squalid.

liii. Scarlatinal infection appears to have been the origin of this child's illness as well as of the abnormalities in two of the co-vaccinees.

liv. There is nothing to indicate that anything associated with the act of vaccination was concerned in the illness. There seem to have been plenty of opportunities for infection from varicella or measles sufficient to account for the fatal illness.

lviii. The abnormality was clearly due to some constitutional peculiarity in the vaccinee.

lx. Vaccinifer, vaccinee, and co-vaccinees all affected alike from some septic source, probably the mammary abscess of the vaccinifer's mother, from which the surface of the vaccinifer's pocks is not unlikely to have become contaminated, on the day of the vaccinee's operation, by handling or otherwise. At the same time it is quite possible that at the time of the vaccination of lx. the vaccinifer might have been incubating disease, but this appears to me a less likely explanation.

lxxx. No suspicion attaches to anything associated with the act of vaccination. A dirty slatternly mother, with a discharging sore on her ear, might readily convey a septic infection to the pocks which were punctured for use on the eighth day. The unwholesomeness of the home and the meddlesome treatment of the pocks must also be taken into account as likely to assist in producing or aggravating the mischief.

lxxxi. Constitutional causes promotive of mischief from the injury inflicted during the fit of convulsions sufficiently explain the case.

lxxxii. The abnormalities in this case were probably due to the child's movements accidentally breaking the pocks and contaminating them with septic matter.

lxxxiii. The erysipelatous contagium was assuredly introduced at the time of vaccination, either in connexion with a personal infectiveness of the vaccinator (or his clothing) or from the vaccinifer, who may be suspected of possibly incubating erysipelas at the time.

lxxxiv. and lxxxv. These are two fatal cases clearly due to a personal infectiveness of the vaccinator (perhaps pertaining to his clothing as well as to himself), which appears to have been more obvious on the day of inspection than on the vaccination day. [It is unfortunate that the report does not state what clothing he wore on these two separate occasions.] It is not to be assumed for certain that the indisposition of lxxxv. in the course of the first week was a sickening for erysipelas. It appears to me altogether far more likely that both these children, over whom the vaccinator spent on the inspection day more time (as he took lymph from them) than over others who did not similarly suffer, received their infection on that occasion than when they were vaccinated. [Some more detailed consideration of lxxxiv., lxxxv., and lxxxiii. is had in Addendum C.

lxxxvi. The origin of the erysipelas in this case is not apparent, but it had clearly nothing to do with the lymph used in vaccinating, as it did not appear until the second week, and the co-vaccinees all passed through a normal course.

lxxxviii. Nothing but casual infection, for which there was opportunity enough, can be suggested in this case.

xciv. This appears to have been the result of infection imparted at the time of vaccination, others vaccinated from other sources on the same day having also suffered. Very probably the uncleanly practice of the vaccinator was concerned in the mischief.

cvi. It cannot be suggested that anything associated with the act of vaccination was concerned here. The mischief appears to have resulted from the injury inflicted by the shield which is not unlikely to have been the agent that introduced a septic contagium.

cviii. Probably this case originated in an infectiveness of the vaccinator personally (or of his clothing) on vaccination day.

cix. The shield used perhaps was the agent of mischief. There is no ground for suggesting anything else.

cx. Notwithstanding the lack of satisfactory information about the source of the lymph and about co-vaccinees, there, is no reason to believe that the abnormalities observed were due to anything associated with the act of vaccination. They were more likely to have been connected with the unwholesome surroundings of the child at his home.

cxi. There is little doubt that the cause of the fatal illness in this case was associated with the act of vaccination, perhaps something amiss with the place or circumstances of the vaccination (it is to be noted that a deputy of the P.V. operated), or that there was some irritating quality in the lymph used.

cxii. There appears no ground for blaming the lymph in this case. It seems questionable whether it was wise not again to postpone the vaccination. Bad nursing and the use of a filthy shield appear sufficient to account for the illness, especially in such an unhealthy child.

cxiii. There is no reason to believe that anything associated with the act of vaccination was concerned. Probably the illness was due to a casual infection communicated through the broken vesicles, and possibly in connexion with the poulticing.

cxiv. There is no reason for supposing that anything associated with the act of vaccination was concerned with the illness. The filthy surroundings of the child's home were probably the

source of infection, their operation being facilitated by the puncturing of the pocks on the eighth day.

cxv. There is no ground for suspecting anything associated with the act of vaccination having been concerned in the illness. The applications used may have retarded the healing of one of the wounds: the source of infection must have been some casual one, while it is to be observed that scarlatina was prevalent in the neighbourhood.

cxvi. The late occurrence of erysipelas after the healing of the wounds, both in cxvi. and her vaccinifer, points to a casual infection, for which, the disease being prevalent as well as scarlatina, there appears to have been ample opportunity.

cxvii. It is by no means certain (inasmuch as the vaccinator used the arm of cxvii. at a time when it was extremely inflamed) that the vaccinator was habitually careful in the selection of his vaccinifer, and doubt comes thus to be thrown upon the fitness of the vaccinifer of cxvii., notwithstanding the statement in the report; for it is further noteworthy that co-vaccinees and subsidiary co-vaccinees suffered from inordinate inflammation. But the dirtiness of the home, overcrowding, and the neighbourhood of cases of scarlatina must not be overlooked among possible causes of the illness.

cxxii. Nothing is told about the vaccinifer and co-vaccinees, but as the illness did not commence before the tenth day it is probable its origin was in some casual infection either at the station or elsewhere.

cxxiii. The erysipelas appears to have started from the opening of the vesicles on the eighth day, and the application of bread poultices, the bread having been kept in a place where it was likely to gather septic contamination, although there was enough in the surroundings of the child at his home to account for the illness.

cxxiv. There is nothing to indicate that anything associated with the act of vaccination was concerned in the illness. Some casual infection, for which there was abundant opportunity about the home, was probably its occasion.

cxxv. The prevalence of measles in the locality appears to have been largely concerned in this case, and in the cases of two of the co-vaccinees.

cxxvi. Injury to a scabbed vesicle seems to have been probably the starting point of the illness in this case: there is nothing to implicate the act of vaccination.

cxxviii. The late commencement of the erysipelas and the place where it was first apparent point to a casual infection rather than to the "conserve" used for vaccination as the reason of the illness. It is to be noted that an opportunity of septic infection was afforded in the visit to the grandmother.

cxxx. That a septic poison was introduced at the time and in the act of vaccination can scarcely be questioned. The immediate source of the poison was not discovered.

cxxxi. Notwithstanding the lack of information about the vaccinifer, the late period at which abnormality became apparent appear to absolve anything associated with the act of vaccination. The occurrence of several cases of enteric fever in the neighbourhood leads to the suspicion that its sanitary condition was not unexceptionable, while the domestic management of the arm was obviously calculated to do mischief.

cxxxii. The explanation of the case seems to lie in some constitutional cause, the influence of which was aggravated by the wretched surroundings after the child was removed from the workhouse.

cxxxiii. There is nothing here to indicate anything associated with the act of vaccination as concerned in the axillary abscess and subsequent convulsions. The child was placed under unfavourable conditions, being fed artificially, and having commenced teething at the time of vaccination.

cxxxiv. There can be little doubt as to the origin of this illness in direct infection from the case of erysipelas at the next house.

cxxxv. The late appearance of the erysipelas does not indicate origin in anything associated with the act of vaccination. The cause is obscure.

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cxxxvi. Probably due to infection from cases of sore throat and unwholesome conditions in the neighbourhood.

cxxxvii. There is nothing here to indicate that the act of vaccination was concerned in producing the erysipelas, which probably arose from some casual infection.

cxxxix. There is nothing in the record to indicate that anything associated with the act of vaccination was concerned in the illness. The circumstances of the home were calculated to induce it in a child with such a family history.

cxli. and cxlii. Both these cases of early erysipelas appear to have had their origin in the use of infected bedding, which probably had not been effectually disinfected. It is noticeable that measles had broken out in the establishment.

cxlv. There is nothing to indicate that anything associated with the act of vaccination was concerned in producing the erysipelas. There was probably some casual infection in connection with the unwholesome conditions of the child's home, and vaccination ought not to have been performed, nor yet circumcision under the circumstances.

cxlvi. The circumstances that followed the discharge of the child and his mother from the workhouse are amply sufficient to account for the mischief that ensued. The vaccination cannot be blamed.

cxlviii. There is nothing to indicate that the lymph or act of vaccination were in fault. Constitutional delicacy and a dirty home were probably the circumstances chiefly concerned in the illness.

cxlix. There is nothing to indicate that anything associated with the act of vaccination was concerned in the illness, which probably had its origin in the foolish domestic treatment the arm received at the hands of the dirty mother, and perhaps also in the unwholesome surroundings of the child's home.

cl. There is nothing to indicate that the lymph used was in fault, but it is observable that the mother was suffering from sore throat at the time of the child's vaccination, and there was some diphtheria in the district, although not in the immediate neighbourhood. The broken condition of one of the pocks on the sixth day seems to suggest that the erysipelatous infection was introduced before that day.

cli. Notwithstanding the lack of information as to co-vaccinees, there is nothing to indicate that anything associated with the act of vaccination was concerned in the illness. An unventilated dirty room in a tenement house, with children having discharging abscesses dwelling in the adjoining room, are circumstances very well calculated to produce the mischief.

cliii. There is nothing to indicate that anything associated with the act of vaccination was concerned in the mischief. Negligence, misery, and dirtiness appear sufficient to account for it.

cliv. This child, being ill before its vaccination, ought to have been postponed. The vaccinator possibly was not free from fault, as he was known not to be very careful in his selection of vaccinifers. But the child belonged to an unhealthy family, and the home was dirty and unwholesome.

clv. It is impossible to judge to what extent the lymph or the vaccinator was in fault in this case. The early commencement of abnormality points to something wrong with one or both. But then it is to be taken into account that erysipelas was prevalent. The shield used is not unlikely to have aggravated the mischief, as it could scarcely fail to have been soiled with the discharges.

clix. Notwithstanding the uncertainty about the vaccinifer, there is no reason for attributing the erysipelas to anything associated with the act of vaccination. There was opportunity for infection at the home, and it is to be noted that the inflammation commenced the day after the puncture of the vesicles.

clxiv. The abnormalities in this case are to be sufficiently accounted for by the injury to the pocks and subsequent mismanagement by an unintelligent, dirty mother.

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clxvi. The date of appearance of the first symptoms indicates that if uncleanliness of the vaccinator's instrument was occasion of the mischief, it is more likely to have been so when the vesicles were punctured on the eighth day than at the time of vaccination. But the dirtiness of the home and the domestic treatment of the arm were quite sufficient to account for the erysipelas by the casual introduction of a septic contagium.

clxvii. A child that was not only teething but only recently recovered from a severe diarrhœa should have been postponed. Septic poison from the child's sleeve fouled with discharge from the broken vesicles was the probable cause of the erysipelas.

clxviii. The account given of the vaccinifer is not satisfactory, but the date of commencement of abnormality does not indicate infection at the time of vaccination. Erysipelas was prevalent, and the nuisances about the home were sufficient to furnish septic contagium—the operation of which might have been favoured by what appears to have been an uncalled-for puncturing of the vesicles on the eighth day.

clxix. There can be no two opinions about the origin of the erysipelas in the unwarrantable meddling of an unqualified assistant, whose fingers might have been the actual source of septic contagium. There is no ground for blaming the act of vaccination. But it is to be noted that children from families suffering from measles were present at the station both on the vaccination and inspection day.

clxxiii. The statement of events two months after their occurrence cannot be trusted as very precise. But the abnormalities appear to date from the domestic application of oil which was at all events of doubtful quality. The overcrowded condition of the child's home is not to be overlooked.

clxxiv. This child, weakened by recent disease, might apparently have received erysipelatous infection from various sources, either from the personally infective vaccinator on the day of vaccination, or on that of inspection either from him or from septic cases present at the same time at the hospital, or again on or after the injury to the punctured spots on the second day. That the earliest symptoms did not appear before the evening of the ninth day render it probable that the infection was received later rather than at the time of vaccination.

clxxv. There is no reason for blaming the act of vaccination for the early manifestation of erysipelas in this case. It is probable the infection was derived in some way from the father's throat.

clxxvi. There is nothing to indicate that anything associated with the act of vaccination was concerned in this case, except that the child was apparently one the vaccination of which should have been postponed again. The fatal illness may fairly be held to be due to his unhealthy condition when the operation was performed.

clxxvii. There is nothing to indicate that anything associated with the act of vaccination was concerned in this case. The vesicles had been opened and scarlatina was prevailing in the neighbouring dwellings with which there was free intercommunication.

clxxviii. There appears no reason to blame anything associated with the act of vaccination. Uncleanliness seems to have had more to do with the illness than anything else.

clxxix. There is no reason for supposing that the erysipelatous contagium was imparted at the time of vaccination. The cause of abnormality in two of the pocks is not evident, possibly the child's ill-health or some mismanagement may have been concerned in it; the general condition of the child's home must be noted in connexion with this.

clxxx. There is nothing to suggest that the erysipelatous contagium was imparted at the time of vaccination. It probably had its origin in the unwholesome conditions about the home.

clxxxii. There is no ground for suspecting anything associated with the act of vaccination to have been concerned in the illness, which was probably due to unwholesome surroundings, some scarlatina being prevalent also in the neighbourhood.

clxxxv. The account of this case does not preclude the possibility that it had its commencement in the course of the first week. Scarlatina was prevalent in the neighbourhood; but it is quite possible that the instrument used in the vaccination (not being one kept specially for this purpose) was concerned in introducing septic poison. Against this, however, is the normal course in the twin child.

clxxxix. There appears quite enough in the condition of the child's home and the prevalence of erysipelas to account for the illness. The vaccinator might have been infective, but if this had been the source of infection, further mischief might have been expected among the co-vaccinees.

cxci. There is nothing to indicate infection at the time of vaccination. The vesicles were punctured on the eighth day; the filthy nuisance abutting on the house might readily account for the mischief that ensued, and the subsequent domestic treatment of the arm was calculated to aggravate it.

cxcii. This child being out of health ought not to have been vaccinated. The late appearance of erysipelas is not favourable to the notion that the infection was imparted in the act of vaccination. But still at that time there was probably something wrong at the station, as indicated by the abnormalities in four of the co-vaccinees.

cxciii. There can be no other view taken of this case than that the mischief had its origin in all that happened after removal of the child from the workhouse.

cxciv. There appears to be some doubt about the fitness of the vaccinifer, partly on account of failures of insertion both in cxciv. and her co-vaccinees; this, however, might possibly have been merely due to comparative inexperience of the *locum tenens* who operated in the act of vaccination. The illness was not improbably due to some constitutional peculiarity or diathesis.

cxcv. There appears no ground for suggesting anything associated with the act of vaccination as concerned in the illness. The home conditions would appear to suffice to explain the occurrence of erysipelas.

cxcvi. The vaccination of this child should have been postponed, his unhealthy condition having probably had much to do with the abnormal progress of the pocks. Measles also seems to have had something to do with it.

cxcvii. There is no information about the source of lymph or about the co-vaccinees if there were any; but it is noticeable that the vaccination was performed by an unqualified person. Inflammation appears to have commenced in the course of the first week. Erysipelas was prevalent in the district, and the practitioner who opened the vesicles on the eighth day might have been himself infective.

cxcviii. There is again no information about the vaccinifer or about the co-vaccinees if there were any; but the inflammation appears to have commenced in the course of the first week. Erysipelas was prevalent in the district, beside which it is quite possible that the child's father, who, as a size-maker, was liable to personal septic pollution, might have been the medium through which septic matter was introduced.

cci. There is no ground for suspecting that anything associated with the act of vaccination was concerned in this illness. The child was in a weakened condition, and ought not to have been vaccinated: that under such circumstances, conjoined with the unwholesome state of his home, mechanical injury to the vesicles should have resulted in ulceration can be no matter of astonishment.

ccii. There is no reason for suspecting anything associated with the act of vaccination as concerned in the illness. It is most probable that the child was infected from the mother, whose sore throat was not unlikely to have been of erysipelatous character. The house was unclean, infection might have been conveyed by the mother's finger or the

cream she applied with it, and scarlet fever was prevalent.

cciii. There is no ground for attributing the illness to anything associated with the act of vaccination. It was not until the scabs began to separate and improper things began to be rubbed into the arm that mischief occurred.

cciv. There is no ground for attributing the illness to anything associated with the act of vaccination. Neglect, dirt, and foulness of atmosphere in a tenement house were quite sufficient to account for mischief, especially after the scabs had got rubbed off.

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lix. There is no reason to suspect the act of vaccination as concerned in the mischief. The vaccinated arm of a child thus weakened and constitutionally scrofulous was most likely to go wrong under neglect and mechanical injury.

lxii. The vaccinator was unquestionably in fault in this case. The occurrence of erysipelas was promoted by the unwholesome surroundings of the child.

lxiii. The probability is that the abnormality in the course of the pocks was the result of contamination from the discharges accompanying the child's vulvitis. The child was not fit to be vaccinated, and her weakened condition no doubt promoted the fatal issue of the attack of bronchitis that arose from exposure to cold.

lxiv. There is no ground for suspecting anything associated with the act of vaccination as concerned in the erysipelas, which is sufficiently accounted for by the child's surroundings at home. The death arose from bronchitis, the result of exposure.

lxv. As in case xxxi. there can be no doubt that the lymph used in vaccination was in fault.

lxvii. There is no reason to suspect anything associated with the act of vaccination to have been concerned in the illness, which was probably due to the dirty and unwholesome surroundings at home.

lxviii. Unwholesome surroundings, and the chance of septic infection, with injury to the pocks on a delicate child suffice to account for the mischief which there is no ground for attributing to the act of vaccination.

lxix. The foul atmosphere of the vaccinating room at the time of the operation suffices to account for the early erysipelas in this case.

lxx. The home conditions under which the child passed through her vaccinia appear sufficient to account for the mischief, which did not become manifest until after the vesicles were punctured. There were abundant chances of septic poisoning.

lxxi. This was a private vaccination, and as is common in such instances, nothing was to be learned about the vaccinifer, or the circumstances of the vaccination. The illness seems to have commenced in the course of the first week. Measles in the neighbourhood, and recently in the house, might have had to do with it.

lxxv. The nature of the illness in this case was not clearly made out, nor was it severe. There was excessive inflammation in the course of the second week, but this was recovered from. The bronchial catarrh and eruption did not appear until the third week. The illness can scarcely be attributed to anything associated with the act of vaccination.

lxxvii. This is a case of ulceration which did not take place until the child was attacked with measles in the fourth week, of which several cases occurred in the institution.

lxxviii. and lxxix. In both these cases the vesicles ruptured, probably from tenderness, a first symptom of approaching mischief, in the course, of the first week, and the pyæmia was associated with epidemic prevalence of scarlatina. It should be a rule of practice never to use lymph from an arm on which even one vesicle has been broken.

lxxxvii. There is nothing to indicate that anything associated with the act of vaccination was concerned in the illness. There were cases of erysipelas in the neighbourhood of the child's home.

xci. The pyæmia in this case most probably arose from contamination with the discharges from the abscesses on the mother, who, dirty herself, had been applying dirty linen and improper dressings to the arm.

xcii. There is no ground for attributing the illness to anything associated with the act of vaccination. Unwholesome surroundings, dirt, and overcrowding appear sufficient to explain it, the child being, moreover, unhealthy and badly nourished.

xcvii. Little information was obtainable about this case; probably some septic infection was received through an open sore.

xcviii. It is not improbable that the pock punctured on eighth day became contaminated with septic discharges from the mother's mammary abscess.

c. and ci. No doubt both these cases originated in the reckless conduct of the vaccinator, who was deranged.

ciii. There can be no doubt that the conditions to which the child was exposed after leaving the workhouse were of a nature to retard the proper healing of the pocks and to introduce a septic infection.

civ. This child and his vaccinifer were living in the same street, the atmosphere of which must have been polluted with the effluvia from the overflowing midden privies, and might therefore have both derived their infection from the same source. Another explanation may be that the vaccinator himself personally (or his clothing) was infective on the day of civ.'s vaccination, and have thus infected both civ. and the vaccinifer (both of whom fell ill on the same day); but, in some degree, against this is the normal course of the co-vaccinees.

cv. There is nothing here to implicate the act of vaccination or anything associated with it. The child was unhealthy, as were other members of the family, the sanitary conditions of the home most unwholesome. Septic material might have been introduced at any period by the applications used.

cvii. and cviia. These were two of a series of reckless vaccinations performed by a locum tenens of a public vaccinator, resulting in inflammations, abscesses, &c. in a number of other children. Inflamed arms were used for the supply of lymph, and the operations were performed with instruments used for other purposes than vaccination. There is no doubt that the infection was imparted in the act of vaccination.

cxviii. The erysipelatous contagium was no doubt introduced at the time of vaccination not only into cxviii. but into the vaccinifer and the co-vaccinees. Either the station itself or the vaccinator personally might have been infective under the circumstances detailed.

cxx. This story of burst vesicles, axillary abscesses, and inflamed arms occurring in the vaccinifer and co-vaccinees, as well as in cxx., seems to indicate a common cause in operation on the day of vaccination. The vaccinifer with burst vesicles (whatever the explanation of this condition might have been) should not have been used, and the lymph might have been the carrier of the contagium, or the surgery might have been an infected place. cxx. might have contracted the erysipelas by more direct exposure, considering the circumstances of the home.

cxxi. This is not an uncommon sort of story as applying to the vaccination of an unhealthy child when vaccination ought not to have been performed under the circumstances. There is nothing to implicate the lymph used.

cxxix. The ulcerations in this case were probably due more or less to constitutional causes and not to anything associated with the act of vaccination. The subsequent fatal illness was quite independent of the vaccinia.

cxliii. It would have been prudent to postpone the vaccination of this child. The lateness of the erysipelas is, in the absence of any record of the vaccinifer, an indication that the illness was not due to anything associated with the act of vaccination. It is to be noticed that there had been erysipelas in the house some months previously, and that scarlatina was prevalent at the time.

Dr. Ballard's Memorandum.

cxliv. The fact that the inflammation did not commence until two days after the pocks had been (needlessly) punctured indicates some sort of casual infection rather than anything associated with the act of vaccination. It is to be noted that measles was prevalent in the district.

cli. The origin of this case is not clear, especially as there is a statement by the mother that one of the vesicles had ruptured before the eighth day. But apart from anything associated with the act of vaccination, the unwholesome condition of the child's home and the prevalence of erysipelas and scarlatina in the neighbourhood would appear sufficient to account for the illness.

clvi. The long period that elapsed before the erysipelas appeared indicates that nothing associated with the act of vaccination was concerned in it. Erysipelas was prevalent at the time: the child had a sore on the ear (about which the erysipelas commenced), and it is not unlikely that fomites might have been concerned.

clxxii. The source of the erysipelatous contagium in this case, which commenced in the course of the first week, is unknown. The fact that one of the co-vaccinees had broken vesicles by the eighth day, although the erysipelas occurred later, seems to suggest that there was some source of infection at the station on the vaccination day. Some other cases among the co-vaccinees commencing in the second week might have been infected on the eighth day from clxxii., or perhaps even from one of the co-vaccinees then present.

clxxxviii. There is nothing to suggest that anything associated with the act of vaccination was concerned in the illness except its commencement in the course of the first week. There had been, it appears, free exposure to measles infection, while the child's home was very unwholesome and filthy.

cxc. There is nothing to indicate that anything associated with the act of vaccination was concerned in occasioning the illness. The unwholesome conditions in the child's home and the prevalence of erysipelas and scarlatina in the neighbourhood suffice to account for it.

cxcix. There is no record of the vaccinifer or of the co-vaccinees (if there were any), but the late occurrence of the erysipelas indicates some casual infection rather than one introduced at the time of vaccination. The prevalence of erysipelas at the time, and perhaps also the dressings applied to the arm, were probably chiefly concerned.

cc. There is nothing to indicate that anything associated with the act of vaccination was concerned in the illness. Erysipelas was prevalent in the district and the mother was ill with sore throat.

For the morbific circumstances specially associated with the ulcerative process, *see* Table II., page 150, and Addendum A., page 178. Altogether there were 46 out of the 150 cases in Group I. which presented at some period or other of their course more or less of this condition. The ulcerative process appears to have commenced mostly during the second and third week; though in only two instances did it commence in the first week (that is before the eighth day); in 18 it appears to have commenced in the course of the second week, in 22 in the course of the third week, and in only three at a later period.

Group II.

Of the eight cases included in this group in the Analytical Table I. there were only five which could be regarded as cases of syphilis. The syphilitic nature of one of them (xc.) has been disputed. If it was a case of syphilis, the disease was certainly not imparted by the introduction of the virus at the vaccinated spots in the act of vaccination, since the course of the phenomena by no means corresponded with what is known as the course of the disease when thus communicated. The same may be said of the remaining four cases, xlv., xlvi., xlvii., and lxxii., in which the syphilis was obviously of congenital origin.

The cases included in Group III. appear to explain themselves without any further comment.

Dr. Ballard's Memorandum.

ANALYTICAL TABLES.

Dr. Ballard's Memorandum.

TABLE I.

ANALYTICAL TABLE of 205 FATAL CASES in which VACCINATION has been alleged or suggested as having been concerned in 1888 to 31st December 1891, and were Reported to the BOARD by the REGISTRAR-GENERAL, or by LOCAL REGISTRARS; against which a * is placed are such as

GROUP I.

Cases in which unusually severe Inflammation of the Arm, Erysipelas, Ulceration of the Vaccinated Places (with possibly attributable to the introduction of Septic material were observed

a. In which Vaccination is mentioned in the Certifi

Number on List of Cases. 1.	Initials. 2.	Age when vaccinated. 3.	No. of Insertions. 4.	Reported by 5.	Date of Death. 6.	Vaccination, Public or Private. 7.	Registered Cause of Death (if certified, in *Italics*). 8.	Death how long Vaccinat 9.
x	G. E. B. -	2 months -	4	Local Registrar -	Oct. 5, 1889 -	Public Vaccinator. Arm to arm.	*Vaccination*, 3 *weeks and* 4 *days; tetanus*, 3 *days.*	Nearly 4 weeks
xii	A. H. W. C.	2 months -	?	Local Registrar -	Oct. 17, 1889	Public Vaccinator. Arm to arm.	*Sloughing of left arm after vaccination* (3 *weeks*); *diarrhœa and exhaustion.*	3 weeks -
xv	F. J. -	5 months -	?	Registrar-General -	Nov. 3, 1888	Public Vaccinator. Arm to arm.	*Vaccination, erysipelas, bronchitis.*	3 weeks -
*xvi	A. E. M. -	3 months -	?	Vaccination Officer and Registrar-General.	Nov. 12, 1888	Public Vaccinator.	*Vaccination; erysipelas*, 8 *days.*	4 weeks -
*xvii	M. R. -	6 months -	?	Local Registrar per Medical Officer of Health, and Registrar-General.	Nov. 12, 1888	Public Vaccinator.	*Vaccination; erysipelas a week after vaccination.*	3 weeks -
xviii	D. T. L. -	2 months -	?	Local Registrar -	Jan. 30, 1889	Public Vaccinator. Preserved lymph.	*Vaccination*, 1 *month; erysipelas erratic*, 3 *mths.* (really 3 weeks).	1 month -
xix	J. R. -	4 months -	3	Local Registrar -	Feb. 2, 1889 -	Public Vaccinator. Calf points from Renner.	*Vaccination with calf lymph*, 1 *month; pyæmia*, 20 *days.*	4½ week -
xx	J. A. W. -	3 months -	3	Local Registrar -	Feb. 13, 1889	Private - Tube.	*Post - vaccinal erysipelas; pyæmia.*	6 weeks -
xxi	F. W. C. -	2 months -	4	Local Registrar -	Apr. 15, 1889	Public Vaccinator.	*Vaccination*, 3 *weeks ago; erysipelas*, 2 *weeks.*	4 weeks -
xxii	F. H. C. -	2 months -	1	Local Registrar -	Apr. 24, 1889	Private -	*Convulsions*, 5 *days; cellulitis of arm* 9 *days, following vaccination on April* 6.	3 weeks -

TABLE I.

Dr. Ballard's Memorandum.

Death. It includes all such cases as the Board have learned to have occurred during the 38 months from 1st November to the knowledge of the BOARD'S INSPECTORS as cases in which such a suggestion might possibly be made. The cases made in any way subjects of Complaint.

GROUP I.

ation not being suggested as Syphilitic), or Abscess (axillary or otherwise) occurred, or in which other conditions ared, or were suggested as in any degree concerned in the Death.

eath or in the record of the Cause of Death.

n Illness commenced, Progress of Disease.	Vaccinifer.	Co-vaccinees.	Sub-vaccinees.	Remarks.
10.	11.	12.	13.	14.
day, normal: 9th ay, redness; 13th day, etid discharge from oots; and formation of ough; 23rd day, tanus.	Reputed normal (not seen).	5 normal; 1 arm inflamed in 2nd week.	Vesicles not punctured.	Shield used; weakly family; another case of infantile tetanus, (not vaccinal) with unhealed umbilicus, about half a mile off. Probably "traumatic" tetanus.
day, redness round ocks and blebs or listers near them, with ischarge from injury pocks; 13th or 14th ay, diarrhœa and one rge crust on arm.	Normal - -	2, one of which had some slight inflammation of arm on 8th day.	No record -	Injury to vesicles; a crust seems to have been miscalled a "slough"; father a delicate youth of 20; child delicate from birth. Neglect and improper feeding. Prevalence of diarrhœa.
day, inflamed; 8th ay, erysipelas; then ronchitis.	Normal - -	2 normal - -	Apparently none -	Unhealthy tuberculous family. Foul home. Cream applied on 7th day.
and 11th days in- ammation, which read extensively.	Normal - -	Some angry redness with in some instances an impetiginous eruption among children vaccinated from various sources about same time, but not serious; no distinct erysipelas.	4; no special record of progress.	Erysipelatous affections not prevalent in neighbourhood. Public Vaccinator was attacked by erysipelas 3 or 4 days after child, and died of erysipelas 4 days before the child. The Inspector does not consider child caught it from Public Vaccinator, or the Vaccinator from the child, but that inflammation prevalent among vaccinees was probably an undeveloped stage of erysipelas.
day redness, rapidly ncreasing; very exten- ve erysipelas by 10th ay.	Normal - -	2 normal - -	None - -	Unwholesome surroundings. Sore throats prevalent in family before child's vaccination.
or 4th day vesicles roken and discharging; uch inflammation by th day; 2nd week, rysipelas extended.	Normal, but about 2 months afterwards had some eczema.	1 normal; 2 other attendants at station vaccinated at same time from other sources showed irregular results.	None - -	Exposure to measles on the vaccination day; injurious sticky applications used.
day, normal; 11th ay, deep sloughing lcer from coalescence.	Normal calf, or no report to the contrary.	2 normal; 11 other children vaccinated with stored humanized lymph not reported otherwise.	$\frac{3}{5}$ vesicles opened, but apparently not used.	Unwholesome surroundings of house with putrid emanations. "Phagedenic ulceration" would have been better name.
sting of vesicles thin nd imperfect; 4th eek, inflammation and welling on *shoulder*, rysipelas; later suppu- ating sores formed nder ill-formed scabs.	Normal (stored tube lymph).	None - - -	None - -	Sweet oil applied (used also for children's heads) on lint, not changed but oil replenished. Vague history of relation to "rotheln" (?). Diphtheria prevalent in neighbourhood.
day, normal, but ith some areola; 8th day, scabs rubbed ff, causing bleeding; ome erysipelas followed.	Normal - -	7 normal - -	No record -	Injury to vesicles by rubbing during 1st week, and neglect of subsequent sores. Erysipelas and puerperal septicæmia prevalent in neighbourhood. Grandmother, with whom frequently in contact, suffering from erysipelas.
day, injury to vesicle ollowed by some dis- harge; 11th day, dema extending down rm and to chest, after- vards convulsions and neumonia.	Normal, but vesicles broken when lymph taken.	None - - -	Vesicle not opened	New shield used on 10th and 11th days.

Dr. Ballard's Memorandum.

GROUP

Cases in which unusually severe Inflammation of the Arm, Erysipelas, Ulceration of the Vaccinated Places (such ulce... attributable to the introduction of Septic material were observed and appe...

a. In which Vaccination is mentioned in the Certific...

Number on List of Cases. 1.	Initials. 2.	Age when vaccinated. 3.	No. of Insertions. 4.	Reported by 5.	Date of Death. 6.	Vaccination, Public or Private. 7.	Registered Cause of Death (if certified, in *Italics*). 8.	Dea... how lon... Vaccin... 9
XXIII	J. B.	2 months	?	Local Registrar, with supplement from Medical Officer of Health.	May 1, 1889	Medical Officer of Health operator.	*Erysipelas following vaccination with calf lymph.*	4 week
XXIV	J. W. R.	4 months	3	Local Registrar	May 1, 1889	Public Vaccinator. Tube 3 days old.	*Erysipelas following vaccination.*	3 week
XXV	M. B.	4 months	?	Local Registrar	May 17, 1889	Private, by a Public Vaccinator. Points.	*Erysipelas; Vaccination.*	4 week
XXVI	E. C.	3 months	2	Local Registrar	May 24, 1889	Private (assistant).	*Erysipelas following vaccination, 7 days.*	2 week
XXVII	M. C. P.	2 months	4	Local Registrar	June 23, 1889	Public Vaccinator.	*Vaccination; septic infection, 2 months.*	9 week
XXVIII	D. E. T.	5 months	5	Local Registrar	June 21, 1889	Dr. Cory	*Erysipelas following vaccination from calf lymph; convulsions.*	5½ wee
XXIX	M. J. L.	months	?	Local Registrar	June 25, 1889	Public Vaccinator.	*Vaccination, 6 weeks; erysipelas, 5 weeks; asthenia.*	6 week
XXX	J. M.	2 months	4	Local Registrar	July 28, 1889	Public Vaccinator. Arm to arm.	*Vaccination; erysipelas; asthenia.*	3 week
XXXI	M. A. B.	4 months	2	Local Registrar	July 29, 1889	Private, by a Public Vaccinator. Tubes.	*Vaccination; erysipelatous inflammation; acute bronchitis; exhaustion.*	2 week
XXXII	E. E.	1 month	4	Local Registrar	Aug. 13, 1889	Public Vaccinator. Arm to arm.	*Blood poisoning following vaccination, 8 weeks.*	9 week
XXXIII	H. E.	3 months	4	Local Registrar	Sept. 26, 1889	Public Vaccinator supervising. Arm to arm.	*Vaccination, erysipelas.*	5 week

inued.

Dr. Ballard's Memorandum.

being suggested as Syphilitic), or Abscess (axillary or otherwise) occurred, or in which other conditions possibly were suggested as in any degree concerned in the Death—*continued.*

th or in the record of the Cause of Death—*continued.*

en Illness commenced, l Progress of Disease. 10.	Vaccinifer. 11.	Co-vaccinees. 12.	Sub-vaccinees. 13.	Remarks. 14.
day, first inflamed on ight of inspection; nd week, erysipelas pread to abdomen.	Calf lymph, nothing known against it.	4 normal - - -	Vesicles punctured 8th day, but not for use.	Source of infection not traced. Child wore an unwashed maroon coloured frock.
8th day, vesicles found abbed, large areola; 0th day, and subse-uently, erysipelas.	Normal (stored tube).	11 normal; 1 not seen -	Sub-vaccinee from a co-vaccinee had some inflammation, not serious.	Family history of susceptibility to erysipelas. Probably communicated from mother to the child.
day, no redness; 2nd eek, erysipelas and oughing sores.	Not stated (fresh points).	4 normal - - -	No record -	Vesicles injured by adherent rag on 11th day, when poultice applied which brought away the tops of vesicles, then cream applied. Febrile ailment in family, and at school where eldest child attended.
day, normal; 10th day, dness *on head*, which pread, but not to vac-nated arm, which was en free from areola; nvulsions.	Unknown -	No record - -	Vesicles not opened	Erysipelas probably unconnected with vaccination. Home not obviously unwholesome.
day, vesicles inflamed d lymph opaque; 2nd eek, erysipelas and alescence of pocks to one deep sore; loss blood from stomach d bowels at end of ness.	One remove from trade calf; not identified with certainty; presumed vaccinifer rather inflamed on 8th day.	Identification doubtful, some seem to have been inflamed or ulcerated.	No record - -	Certifier attributes illness to dirt. Child's arm not kept clean. Water so polluted as to be unfit for drinking, used for all domestic purposes. Other children of family unhealthy; one of them had discharging sinuses from hip joint disease.
day, normal; 11th ay, redness; 4th week, ysipelas, which after-ards disappeared, and m healed; cerebral mptoms and con-ulsions.	Beard's calf lymph (nothing against it).	106, not heard of as abnormal.	Nothing particular; two tubes taken and sent abroad.	—
day, inflammation and ocks broken; 11th y, erysipelas, then ceration and slough-g.	Arm slow in heal-ing. Impetigo on face in 1st and 2nd weeks.	3 normal, as well as others vaccinated same day from different source.	No record -	Dirty house. Cream and poultices applied to arm. Thrush at time of vaccination. Mother had ulcerated legs.
inspected on 8th day child was not well; st seen 16th day; in-mmation began on 0th day, and spread tensively.	Normal - -	2 normal (one of them died of convulsions before inquiry).	None - -	Scarlatina prevalent. Sanitary surroundings not good.
day, thin scabs found place of vesicles, with-t redness, but large ister on elbow and dness *on forearm*, hich spread exten-vely with a few naller blisters; 11th y, bronchitis and arrhœa.	No record -	No LXV. vaccinated from same batch of tubes.	None - -	This Public Vaccinator had on a previous visit been blamed by inspector. In connexion with this case, *see* LXV., with a similar story, but vaccination not mentioned in death certificate. Also a *non-fatal* case of similar nature (C.M.M. in Table of Complaints) is noted by inspector; it occurred in the practice of the vaccinator who supplied the tubes for XXXI. and LXV. (*l. b.*). The lymph in one of the batch of tubes was found to be infected with the streptococcus of erysipelas, and in another the staphylococcus pyogenes albus.
day, normal; 2nd eek, or later; inflam-ation which spread ith vesications which ried up; when appa-ntly better, death by nvulsions.	Normal - -	3 norma; 1 not found -	No record -	Mother simultaneously attending to another child with compound fracture; foul surroundings; cases of mumps next door.
day, vesicles found lvanced, dark coloured, d with excessive reola; 12th day, in-mmation; extensive ysipelas.	Normal - -	1 normal - -	Vesicles not opened	Filthy home; erysipelas recently in house and immediate vicinity, and child used filthy couch and pillow used by sister when suffering from erysipelas.

Dr. Ballard's Memorandum.

GROUP —

Cases in which unusually severe Inflammation of the Arm, Erysipelas, Ulceration of the Vaccinated Places (such ulceration attributable to the introduction of Septic material were observed and appended,

a. In which Vaccination is mentioned in the Certificate of

Number on List of Cases. 1.	Initials. 2.	Age when Vaccinated. 3.	No. of Insertions. 4.	Reported by 5.	Date of Death. 6.	Vaccination, Public or Private. 7.	Registered Cause of Death (if certified, in *Italics*). 8.	Death how long after Vaccination. 9.
XXXIV	M. A. H.	4 months	1	Local Registrar	Oct. 8, 1889	Private - Arm to arm.	*Erysipelas following vaccination.*	4 weeks
XXX	W. A. C.	3 months	1	Local Registrar	Oct. 18, 1889	Private - Arm to arm.	*Vaccination, erysipelas, asthenia.*	3½ weeks
XXXV	L. E. B.	1 month	5	Local Registrar	Nov. 1, 1889	Dr. Cory	*Vaccination (calf lymph); erysipelas.*	25 days
XXXVIII	W. R. E. W.	6 weeks	3	Local Registrar	Nov. 3, 1889	Public Vaccinator. Tube.	*Erysipelas of chest and back (arising 15 days after vaccination), 5 days; exhaustion.*	18th day
XXXIX	R. A. T.	9 months	4	Local Registrar	Nov. 9, 1889	Public Vaccinator. Arm to arm.	*Post-vaccinal erysipelas; bronchitis.*	2 months
XL	L. E. E. B.	7 months	1	Local Registrar	Oct. 26, 1889	Private, by an unqualified practitioner at a 6*d*. dispensary, "under cover," charged 1*s*. for operation. Points used.	*Phlegmonous erysipelas, 19 days (after vaccination).*	3½ weeks
XLI	R. A. S.	5 months	3	Local Registrar	Nov. 10, 1889	Private	*Vaccinated Sept. 30; septicæmia Nov. 4; and erysipelas; convulsions, 10 hours.*	6 weeks
XLII	E. P.	4 months	4	Local Registrar	Nov. 17, 1889	Public Vaccinator. Preserved lymph.	*Vaccination (Oct. 18); septicæmia 14 days.*	4½ weeks
XLIII	F. E. H.	3 months	4	Local Registrar	Dec. 22, 1889	Public Vaccinator. Arm to arm.	*Pyæmia following vaccination; bronchitis.*	4½ weeks
XLIV	M. A. F.	1 month	4	Local Registrar	Dec. 25, 1889	Public Vaccinator. Arm to arm.	*Erysipelas; vaccination.*	3 weeks

ntinued.

ot being suggested as Syphilitic), or Abscess (axillary or otherwise) occurred, or in which other conditions possibly were suggested as in any degree concerned in the Death—*continued*.

eath or in the record of the Cause of Death—*continued*.

When Illness commenced, and Progress of Disease.	Vaccinifer.	Co-vaccinees.	Sub-vaccinees.	Remarks.
10.	11.	12.	13.	14.
3th day; erysipelas spreading from vesicle.	No record -	No record - -	Vesicles opened on 8th day, and lymph taken in tube.	Father being an anti-vaccinator, child was taken to a practitioner who only vaccinates in one place, and whose proceedings are not those of the Board; people cleanly; apparently this private vaccinator not very particular in important respects.
th day, redness; by 8th day, much inflamed; by 10th day, erysipelas had spread extensively to trunk; subsequently to head and other parts; ulceration; finally bronchitis and diarrhœa.	No record -	Not to be identified, but abundant inflammations, and failures in practice.	2 or 3 not identified	Vaccinator only vaccinates in one place, charging 6*d*. for it, and apparently in a rough manner, with small amputating knife. Milk, cream, rags, and poultices applied; scarlatina in neighbourhood; vaccinator had at the time some 70 cases of scarlatina under treatment.
th day, normal; 11th day, inflammation; 13th, erysipelas.	Board's calf vaccination.	86, no irregularity reported.	Vesicles not opened	No explanation.
th day, normal; 9th day, inflammation round pocks, and watery heads on inflamed area; 11th day, erysipelas on shoulder, which spread, and pocks by 15th day covered with one large crust.	Normal - -	4 normal (all vaccinated with tube lymph).	Vesicles pricked, but lymph not used.	Mother had offensive purulent discharge from her ear, which began day before child's vaccination. On 8th day, child's dress stuck to pricked vesicles, which were torn open in removing it; child insufficiently nourished, mother's milk failing from privation.
th day, normal; 21st day, scabs rubbed off, and in a few days, erysipelas extensive, and bronchitis, which caused death.	Normal - -	8 normal; 2 not found -	Vesicles not opened	Mother mill-hand; dirty neighbour takes charge of child in working hours; poultices, cream, &c., applied to wounds left by rubbed-off scabs; erysipelas got better, but child died with bronchitis.
By 7th day, inflamed, shoulder to elbow; by 10th day, erysipelas extended to chest; abscess; convulsions.	Unknown -	No record - -	Vesicle not pricked	Vaccinator uses "points" over and over again; child delicate; old shield, often used before, put on the day of vaccination; cases of erysipelas and puerperal septicæmia in neighbourhood; mother had trouble with vaccination of previous children, all of whom had used the same shield; weakly family; $\frac{2}{3}$ other children dead; home dirty.
Normal course until about 28th day, when blebs (regarded as vaccinia) appeared on arms and legs; at end of 5th week scabs rubbed off, leaving sores; bronchitis, erysipelas, and pneumonia, and died in convulsions.	Calf lymph (Renner's).	2 from same consignment of lymph; normal.	Vesicles not opened on 8th day.	Scabbing vesicles said to have been injured; sores dressed with cream and violet powder; probably also caught cold.
th day, normal; 21st day, or earlier, redness and sloughing ulcers, extensive erythema.	Normal - -	None - - -	Vesicles not opened on 8th day.	Surroundings of house (farmhouse) filthy; sewage close to doors; mother markedly scrofulous.
(19th day, arm had healed.) 23rd day, bronchitis; 32nd day, erysipelas.	Normal - -	1 normal; 1 could not be traced.	1 healing retarded by careless and dirty nursing; two tubes also filled.	Defective drainage of house.
th day, normal; 13th day, redness, which extended; convulsions before death.	Normal - -	18 normal, except where vesicles injured by careless nursing.	Vesicles normal on 8th day, and four tubes taken for N. V. E.; two of these produced normal results.	Erysipelas not explained; possibly some accidental infection of opened vesicles.

Dr. Ballard's Memorandum.

GROUP I.

Cases in which unusually severe Inflammation of the Arm, Erysipelas, Ulceration of the Vaccinated Places (such ulcerati attributable to the introduction of the Septic material were observed and appear

a. In which Vaccination is mentioned in the Certificate

Number on List of Cases. 1.	Initials. 2..	Age when vaccinated. 3.	No. of Insertions. 4.	Reported by 5.	Date of Death. 6.	Vaccination, Public or Private. 7.	Registered Cause of Death (if certified, in *Italics*). 8.	Death, how long af Vaccinatio 9.
LII	G. T.	4 months	?	Local Registrar	Apr. 4, 1889	Public Vaccinator.	*Broncho-pneumonia following vaccination.*	6½ weeks
LIII	C. B.	6 months	?	Local Registrar	May 12, 1889	Public Vaccinator.	*Vaccination; scarlet fever; ulceration; exhaustion.*	4 weeks
LIV	H. E. W. S.	2 months	4	Local Registrar	May 24, 1889	Public Vaccinator. Arm to arm.	*Vaccination*, 15 *days; pneumonia; meningitis.*	2 weeks
LVIII	A. T.	3 months	4	Local Registrar	Apr. 24, 1889	Private	*Erysipelas following vaccination*, 1 *month.*	4 weeks
LX	M. K.	3 months	3	Local Registrar	Oct. 11, 1889	Medical Officer of Institution. Arm to arm.	*Debility from birth; vaccination*, 24 *days; ulcerated arm*, 15 *days; exhaustion*, 15 *days.*	24 days
LXXX	G. S.	3 months	2	Registrar-General	June 1, 1889	Public Vaccinator. Arm to arm.	*Sloughing and cellulitis, post-vaccinal. (Inquest.)*	39 days
LXXXI	A. I. W.	3 months	2	Registrar-General	May 18, 1889	Private	*Vaccination*, 45 *days; secondary*, 9 *days; abscess of axilla*, 6 *days.*	45 days

Dr. Ballard's Memorandum.

nued.

being suggested as Syphilitic), or Abscess (axillary or otherwise) occurred, or in which other conditions possibly ere suggested as in any degree concerned in the Death—*continued.*

h or in the record of the Cause of Death—*continued.*

n Illness commenced, Progress of Disease.	Vaccinifer.	Co-vaccinees.	Sub-vaccinees.	Remarks.
10.	11.	12.	13.	14.
mal course up to 4 eeks after vaccination, en ulceration and scess; death from oncho-pneumonia.	Normal - -	6 normal - - - -	No record - -	Foul squalid domestic surroundings; unhealthy family; injury to vesicles during 4th week; mother with purulent discharge from eyes; crusts came off 4th week after poulticing, leaving ulcers.
nal up to end of 2nd ek, when scabs fell, d ulcer formed; 3rd ek scarlatina.	Calf lymph (Renner).	4 normal - - - - 1. Pocks discharged during an attack of scarlatina, but then dried up. 1. Discharging sores and inflammation.	No record - -	Dressed with poultices, housleek and cream; scarlatina and diphtheria prevalent during vaccination period. Fatal result ascribed to this. Family tuberculous.
lay, normal; 9th day, lness and swelling arm; then on 13th y, the four places nning into one and scharging pus, with tensive brawny elling, a vesicular bilicated eruption ossibly varicella) and eumonia.	Normal -	4 normal; 1 secondary scabs; 2 (apparently) varicella; 1 died of measles.	No record -	Measles and chicken-pox prevalent in neighbourhood; all kinds of patients received in vaccination room at vaccination times; mother applied rags steeped in castor oil. A co-vaccinee was on inspection day taken to the station while incubating measles.
day, vesicles broke; th day, "secondary sicles" or blebs gan to appear around imary pocks, and timately formed a ge crust by coalence, and arm subsequently inflamed; other nilar blebs appeared the face.	Calf lymph from N.V.E.	None recorded, but 31 children vaccinated from the same calf were normal.	No record; most probably none.	A first child of same couple (who are first cousins), aged 4 years, was privately vaccinated in 1887 by a *different practitioner* with *humanised lymph* from a normal arm. In the third week ulceration occurred on fall of the scabs with "secondary vesicles" between the sores, subsequently coalescing with them as in A. T.'s case, and child died 9 weeks after vaccination. This child also had a succession of blebs in various parts of the body. Registered cause of death was "Pemphigus gangrænosus." Four co-vaccinees normal. Both cases regarded by inspector as probably of the same nature and due to some constitutional peculiarity in the patients. Weakly parents.
8th day, broken vesi-es; 15th day, bulla, mbracing all three vesi-s which sloughed.	Vaccinifer normal on 8th day, but 4 days after inspection and use, suffered like LX. and his co-vaccinees, but recovered; his mother had a mammary abscess.	Primary, 4, re-vaccinations, 6; all on date of inspection or shortly afterwards had blebs or bullæ at seat of vaccination, followed by sloughing, results being more intense in the primary than in re-vaccinations; all recovered.	Vesicles not punctured.	No infectious sickness in institution at the time. With exception of mother of vaccinifer, who had mammary abscess, no chronic ulcers or sores, &c., among the attendants on the children in the institution. Vaccinifer illegitimate.
w days after 8th day spection, redness, ich extended, and cks ran into one re; typical phlegnous erysipelas; ortly before death a w spots "exactly like ccine pocks" apared on legs, arms, d scalp.	Normal - -	1 normal - -	1 normal - -	Mother dirty, slatternly, with discharging sore on ear; unwholesome surroundings of house; mother applied bread poultice on return from 8th day inspection, and cream later on.
cs crusted slowly th week); in 5th ek convulsions, durg which scabs came detached, followed by spreading dness, which (with res) healed; then scess in axilla.	Board's calf lymph (point).	2 others with points of same consignment, normal; 75 per cent. supplied from same source report only 2 trifling abnormalities.	Vesicles (normal) pricked on 8th day, but no lymph taken.	Mother apparently healthy, but with some strumous taint, and subject to abscesses. The term "secondary" on certificate had no technical signification, and only implied that the inflammation from abraded sores was a secondary cause of death; it did not mean syphilis.

Dr. Ballard's Memorandum.

GROUP I.

Cases in which unusually severe Inflammation of the Arm, Erysipelas, Ulceration of the Vaccinated Places (such ulcerati attributable to the introduction of Septic material were observed and appear

a. In which Vaccination is mentioned in the Certificate

Number on List of Cases. 1.	Initials. 2.	Age when vaccinated. 3.	No. of Insertions. 4.	Reported by 5.	Date of Death. 6.	Vaccination, Public or Private. 7.	Registered Cause of Death (if certified, in *Italics*). 8.	Death, how long af Vaccinatio 9.
LXXXII	G. B.	4 months	4	Registrar-General	May 31, 1889	Private	*Vaccinia, septic absorption.*	57 days
LXXXIII	E. S.	4 months	4	Local Registrar	Nov. 12, 1889	Public Vaccinator. Points. [This Public Vaccinator is in habit of using old calf lymph points, after steeping in boiling water with carbonate of soda.]	*Vaccination.* 3 *weeks; erythema,* 10 *days; diarrhœa,* 2 *days.*	22 days
LXXXIV	E. P.	6 months	4	Local Registrar	Nov. 13, 1889	Public Vaccinator (the same). Points.	*Diffuse cellulo-cutaneous inflammation,* 10 *days; after vaccination,* 19 *days.*	30 days
LXXXV	F. L.	5 months	4	Local Registrar	Nov. 16, 1889	Public Vaccinator (the same). Points.	*Vaccinia,* 33 *days; erythema and abscess of foot,* 22 *days.*	33 days
LXXXVI	M. P. C.	2 months	3	Local Registrar	Dec. 11, 1889	Public Vaccinator. Arm to arm.	*Vaccination and erysipelas.*	30 days
LXXXVIII	A. G.	4 months	4	Registrar-General	Aug. 1, 1889	Public Vaccinator. Arm to arm.	*Erysipelas,* 14 *days, which commenced* 14 *days after vaccination, and was caused by irritation of the vaccine vesicles.*	5 weeks

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Dr. Ballar Memorand.

being suggested as Syphilitic), or Abscess (axillary or otherwise) occurred, or in which other conditions possibly were suggested as in any degree concerned in the Death—*continued.*

th or in the record of the Cause of Death—*continued.*

hen Illness commenced, nd Progress of Disease.	Vaccinifer.	Co-vaccinees.	Sub-vaccinees.	Remarks.
10.	11.	12.	13.	14.
1 day, no inflammation; 10th day, pocks began to discharge causing "secondary vesicles" on arm, and arm to swell; spots coalesced, a large scab with vesicular margin formed, and "secondary vesicles" appeared elsewhere; died with bronchitis and diarrhœa.	Half a tube of Renner's calf lymph.	1 vaccinated with half of same tube as LXXXII. an hour previously, tube not sealed in the interval; course normal.	Vesicles not punctured on 8th day.	Inspector says secondary vesicles were apparently due to inoculation with child's fingers.
1 day, inflammation; 11th day, diffused.	No. LXXXV. (points), whose vesicles were *normal* on 8th day. (The charged points were laid on bed in vaccination room to dry.)	2, viz.:— C; from points; normal. B; from points; normal on 8th day; vesicles *not* opened; erysipelas from evening of 8th day, severe.	Of course pocks were not meddled with.	Public Vaccinator in vaccinating this child moistened points by *breathing on them*. Healthy family; no fault found otherwise with surroundings.
1 day, normal; 9th, arm inflamed; 10th, and subsequently, 4 spots ran into one sore, and erysipelas extended greatly.	Points taken by Public Vaccinator from normal pock on child vaccinated with N.V.E. calf lymph. Three other children had been vaccinated with similar calf points; two of these, and the sub-vaccinee of one of the 2, did well. *The third* had abscesses in axilla on 12th day, and in the 5th week in inflammation of arm. This third child was used as vaccinifer for 6 children (one tube, the rest points). All did well but one, viz., E. T., who began with erysipelas *on 8th day*, and since the illness 2 older children have had boils. E. T., was, however, used for an arm to arm vaccination, which had no serious result. Probably E. T.'s arm was not inflamed when the lymph was taken, as the vaccinator is said to be generally careful.	4 other children altogether were vaccinated from the same source, viz., LXXXV., who had erysipelas and died; the other 3 (2 from tubes and 1 from points), did well; their pocks had not been meddled with on 8th day, as those of LXXXIV. and LXXXV. were.	1, viz.:— W. L., tube; slightly inflamed on 8th day; but used for 3 arm to arm vaccinations, one of which on 9th day had a *rubeolous rash*, lasting 2 days only; the others did well.	While child was ill mother fell ill with submaxillary abscess, and subsequently the father with a sloughing abscess on his finger. House not unwholesome.
ild said not to have been well in first week; in 2nd week erysipelas, and in 3rd week abscess in foot.			3, viz.:— E.S. (No. LXXXIII.), from points; erysipelas apparently commencing on 4th day. C., from points; normal. B., from points; normal on 8th day; but erysipelas severe from 8th day; vesicles were not opened.	Family and dwelling healthy. [As respects Nos. LXXXIII., LXXXIV., and LXXXV., all vaccinated by Public Vaccinator either on the 14th or 21st of October, there is reason to suspect that the Public Vaccinator, himself personally infected, was the agent in infecting the children.]
h day, normal; 9th day, child irritable; 10th day, general papular rash; on its disappearance on 12th day, inflammation about vesicles with swelling and hardness, and erysipelas spread to trunk, limbs, and head.	Normal - -	5 normal, 1 not found -	7 tubes supplied to N.V.E.; normal results of use, except in one instance, where, in a child of delicate parentage, vesicles retarded, and some pustules appeared at some period after operation.	Sanitary condition of house good; no erysipelas in neighbourhood.
h day, normal; subsequently 2 lower vesicles broken by rubbing; later (apparently at beginning of 3rd week) redness passing into phlegmonous erysipelas.	Normal - -	2 normal - -	1 normal - -	Mother a dirty person; frequently with her dirty fingers rubbed inferior castor oil on vesicles.

Dr. Ballard's Memorandum.

GROUP —

Cases in which unusually severe Inflammation of the Arm, Erysipelas, Ulceration of the Vaccinated Places (such ulceration attributable to the introduction of Septic material were observed and appeared,

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Number on List of Cases. 1.	Initials. 2.	Age when vaccinated. 3.	No. of Insertions. 4.	Reported by 5.	Date of Death. 6.	Vaccination, Public or Private. 7.	Registered Cause of Death (if certified, in *Italics*). 8.	Death how long after Vaccination. 9.
XCIV	W. C.	5 months	4	Registrar-General	Nov. 18, 1889	Public Vaccinator. Arm to arm.	*Sloughing of vaccine vesicles, 3 weeks; bronchitis, 6 days.*	4 weeks
CVI	M. W.	6 months	3	Local Registrar	Mar. 5, 1890	Private - - Tube from Public Vaccinator.	*Vaccination, 46 days; erysipelas of arm and shoulder, 7 days; broncho-pneumonia, 4 days.*	5 weeks
CVIII	C. E.	3 months	4	Local Registrar	April 23, 1890	Private - - Tube (calf).	*Vaccination, 14 days; erysipelas, 3 days.*	14 days
CIX	H. W. W.	2 months	3	Local Registrar	April 30, 1890	Public Vaccinator. Tube, 1 remove from calf.	*Vaccinated 27 days; erysipelas, 5 days; convulsions, 1 hour.*	27 days
CX	A. H. P.	1 month	2	Local Registrar	Jan. 22, 1890	Private - -	*Effects of vaccination, 3 months; ulceration of bowels, 7 days.*	4 months

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… or in the record of the Cause of Death—*continued.*

…n Illness commenced, … Progress of Disease.	Vaccinifer.	Co-vaccinees.	Sub-vaccinees.	Remarks.
10.	11.	12.	13	14.
…day, seemed ill; 5th …y, slight redness …nd vesicles; 12th …y, inflamed from …oulder to elbow; sub-…quently scabs fell, …aving large sores, two … which coalesced; …ally bronchitis.	Normal - -	None. But of 6 other children vaccinated on same day from three different sources (other than W.C.'s) two had unduly inflamed arms in 2nd week, and one had burst vesicles, excessive inflammation first observed on 7th day, on 12th day axillary abscess and subsequently ulceration. The mother of this last case (the sanitary surroundings of whose home were extremelyunwholesome), was present at station when these vaccinations were performed. She had only recently recovered from enteric fever. A fourth child had broken vesicles, attributed to rubbing, but with the remaining $\frac{2}{3}$ did well.	Vesicles not opened	Vaccinator does not appear to cleanse his "Cooper Rose" vaccinating instrument before each operation. Family with strongly marked consumptive history.
…day, normal, scabbed …due course; 23rd …y, caught cold and …ield knocked off scabs; …dness and swelling …llowed; by 29th day …dness over whole …ob and bronchitis; …m got well, but child …d of broncho-pneu-…onia.	Not known, but said by Public Vaccinator to be healthy.	2 children vaccinated with same batch of tubes, from a Public Vaccinator, normal.	Vesicles not opened	Vaccination shield used to protect vesicles.
…day, inflamed; 9th day, …oken vesicles, brawny …elling to elbow; 13th …y, three of the pocks …cerated, and the …urth surrounded by …all blebs.	Calf lymph (trade) mixed with glycerine; other 18 tubes of *same consignment* with 1 exception produced no abnormalities *in other men's hands.*	7, not all on same days, with tubes of same consignment, of which 4 were normal, but 1, vaccinated on leg, had brawny red swelling on 9th day; 1 delayed, but subsequently arm much inflamed; 1 vaccinated on leg, much inflamed.	No record - -	Vaccinator had on day when he vaccinated deceased and 1 of the co-vaccinees, subsequently erysipelatous, come recently from a bad case of idiopathic erysipelas, and next day after similar visit vaccinated the second co-vaccinee mentioned; and then on a subsequent day paid last visit to his patient, and subsequently inspected deceased and vaccinated the third co-vaccinee mentioned. He had previously to all this been in daily attendance for a fortnight upon another case of facial erysipelas.
… day, erysipelas com-…enced in neighbour-…od of spots.	No statement except that same lymph had been used by another practitioner and no ill resulted.	1 normal - - -	8 normal, but 1 of them rubbed and healing retarded.	Previously used vaccination shield; no septic disease known to be prevalent in neighbourhood.
… spot failed; 8th day, …sicle normal; subsec-…ently, crusted; later …, crust detached and …cerated surface left, …ich again crusted; …out same time an …parently porriginous …uption came on …eeks, forehead, and …alp; a week before …ath, diarrhœa and …miting.	No satisfactory information, but human, and probably 1 remove from calf.	No record; but vaccinator says no other vaccination in his practice went wrong.	No record -	Mother had 2 miscarriages, but otherwise healthy. One child dead from teething, 2 living and healthy. Mother says child had general red rash at birth. Home when vaccinated, and up to 6 weeks before death, unwholesome surroundings.

Dr. Ballard's Memorandum.

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CXI	E. G.	1 month	4	Local Registrar	May 7, 1890	Public Vaccinator's deputy.	*Vaccination; acute eczema.*	15 day
CXII	H. E. M.	9 months	2	Local Registrar	Feb. 8, 1890	Private	*Epileptic convulsions since birth; exhaustion following vaccination, 5 weeks.*	5 wee
CXIII	E. W.	4 months	4	Local Registrar	June 4, 1890	Public Vaccinator. Arm to arm.	*Vaccination; erysipelas.*	3 wee
CXIV	A. A.	3 months	4	Local Registrar	May 28, 1890	Public Vaccinator. Arm to arm.	*Vaccination; erysipelas.*	4 wee
CXV	F. W. R.	5 months	4	Local Registrar	July 2, 1890	Public Vaccinator. Preserved lymph.	*Vaccination; erysipelas.*	6 wee
CXVI	E. A. C.	2 months	3	Local Registrar	June 14, 1890	Public Vaccinator. Tube.	*Erysipelas after vaccination.*	45 da
CXVII	J. M	2 months	4	Local Registrar	Feb. 8, 1890	Public Vaccinator.	*Erysipelas after vaccination, 12 days; gastro-enteritis 24 hours; convulsions 6 hours.*	31 da

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…Illness commenced, …rogress of Disease.	Vaccinifer.	Co-vaccinees.	Sub-vaccinees.	Remarks.
10.	11.	12.	13.	14.
…ay, vesicles found …een; 10th day, in- …ted round, and …s on cheek, which …nded *all over body.*	Normal. One remove from trade lymph.	2, both of which had broken vesicles on 8th day. Of these 2, one broke on 2nd day, followed by redness to elbow, axilla and side of trunk; 7th day, small bladders round vesicles; 8th day, a convulsion, but recovered. The other "all raw" on 2nd day, inflammation subsequently, small bladders about vesicles, discharge from which seems to have infected a 2 year old sister.	None - -	Child small and ill-nourished; partly breast fed, partly biscuit food; mother had 11 children, of which (in addition to deceased) 2 dead from infantile convulsions, and 1 from malformation from birth; 1 boy had boils 12 months after vaccination. There seems to have been some irritating quality in the lymph, notwithstanding vesicles of vaccinifer "said" to have been normal.
…failed. The other …an on 8th or 10th …as a blister, form- …crust a few days …r, with a *redness on …k and swelling of …scalp*, lasting a few …s; vomiting and …rhœa and epileptic …before death.	Calf tube (Renner's).	2 from same batch of tubes; normal.	None - - -	Child born blind and ailing from birth; subject to fits from 3 months old; vaccination twice postponed; shield used in 2nd week and became filthy with discharge; nursing bad. Mother had 4 still-born children, and lost 2 children, 1 from bronchitis, aged 3 weeks, and 1 from fits, aged 3 days.
…y, found injured by …bing; 9th or 10th …, inflammation pro- …ling to erysipelas, …ch extended to trunk.	Normal - -	7 normal; 1 injured by rubbing.	None; not pricked	Breast fed; 8th day arm poulticed with bread and milk. Drain gully just in front of house.
…y, normal; 9th day, …with swelling and …sipelas which spread …r body; sloughing …scrotum.	Normal - -	1 normal - -	5 normal -	Very unwholesome filthy surroundings of house.
…d; 8th day, normal …icles; 36th day, 2 …ts healed; 1 showed …erficial unhealed …e, red and angry; …sipelas, extended …erally over body.	Normal - -	4 normal - -	No record - -	From 8th day house-leek and cream applied with pigeon's feather; scarlatina prevalent in village, and at school where father taught.
…ed; 2nd day, slight …ness; 8th day, …od red from shoulder …elbow, which soon …sided, and spots …led by end of 3rd …k. But then ery- …elas of vaccinated …n *began from shoul-* …r and spread over …y and legs.	Slight localised redness from 3rd to 4th day, increasing after 8th day. All healed in 3 weeks. *Then* erysipelas, but recovered.	2 normal, but one of them, scab prematurely rubbed off, healed slowly; mother of the other contracted erysipelas somehow.	Vesicles pricked, 8th day.	Scarlatina and erysipelas rife in the district, and all three erysipelas cases mentioned had ample opportunities of getting infection. The somewhat similar and unusual course of vaccinifer and CXVI is worthy of note.
…day, inflammation, …ich on 8th day had …ended from shoulder …elbow; 11th day, …illary glands enlarged; …l week, erysipelas …ended generally over …ly; 14th or 15th day, …bs separated, leaving …p sores; diarrhœa.	Normal and no excess of areola.	9 undue inflammation, and 1 of these extensive; (similar occurrences in other vaccinations done about same time).	7, same as co-vaccinees.	Overcrowding; parents, the deceased and 5 brothers and sisters occupied a filthy comfortless room; scarlatina in two dwellings close by. (As regards the co-vaccinee, who suffered from extensive inflammation, dirty parents, and "serious privy nuisance.") Vaccinator not habitually careful to avoid use of areolated arms, *e.g.*, of J. M.

Dr. Ballard's Memorandum.

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CXXII	F. C.	3 months	1	Local Registrar	Mar. 7, 1890	Private — Arm to arm.	*Erysipelas*, 1 *week (from cold in recently vaccinated arm).*	3½ wee
CXXIII	P. F. S.	2 months	4	Local Registrar	July 29, 1890	Public Vaccinator. Tube.	*Vaccination*, 1 *month; erysipelas, 3 weeks.*	27 day
CXXIV	E. E. W.	2 months	2	Local Registrar	Aug. 25, 1890	Private	*Vaccination*, 1 *month; erysipelas, 2 weeks.*	6 week
CXXV	J. H. H.	4 months	3	Local Registrar	Aug. 21, 1890	Public Vaccinator. Arm to arm.	*Vaccination; pyæmia.*	6 week
CXXVI	A. V. P.	3 months	4	Local Registrar	July 26, 1890	Public Vaccinator (per student at Educational Establishment). Arm to arm.	*Vaccination; abscess.*	10 wee
CXXVIII	R. C.	1 month	?	Local Registrar	July 25, 1890	Private — Calf-lymph "conserve."	*Erysipelas after vaccination.*	4 week
CXXX	B. H. D.	5 months	2	Local Registrar	Oct. 16, 1890	Private — Tube (1 remove from trade Warlemont's calf).	*Vaccination; inflammation.*	13 day
CXXXI	H. S.	4 months	2	Local Registrar	Nov. 6, 1890	Private — Tube (1 remove from Hime's calf).	*Vaccination; erysipelas.*	3½ wee

Dr. Ballc... Memoran...

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...n being suggested as Syphilitic), or Abscess (axillary or otherwise) occurred, or in which other conditions possibly ...were suggested as in any degree concerned in the Death—*continued.*

...th or in the record of the Cause of Death—*continued.*

...hen Illness commenced, ...d Progress of Disease. 10.	Vaccinifer. 11.	Co-vaccinees. 12.	Sub-vaccinees. 13.	Remarks. 14.
...h day, normal; 10th day, arm inflamed; erysipelas spread to back.	Unknown - (Vaccinator keeps no record.)	2, not to be traced -	No record - -	Vaccinator vaccinates in one place only; inspection day bitterly cold; surgery common to vaccinees and all other patients. Privy middens in too close proximity to house. No shield. Only bread poultices applied. No erysipelas or infectious disease to be heard of in neighbourhood.
...h day, normal; 10th day, *redness on shoulder;* 17th day, erysipelas had become extended to chest, and ultimately to whole body.	Normal on 8th day, but subsequently inflamed.	4, of which 1 (dirty surroundings) undue redness to shoulder, injured by nursing; 1 undue redness 8th day, but healed naturally; 2 normal.	10, normal, except for undue redness in 3 cases, and injury in 1 case.	Bread poultices applied on 8th and 9th days. Scarlatina prevalent in neighbouring districts, but not about child's home. Unwholesome surroundings of home, and food (including bread) kept in small room, where inspector saw foul clothes also.
...h day, normal; 31st day, scabs fallen; red patch *just below one vaccinated place;* erysipelas extended generally over body; hacking cough last few days.	Normal - -	1, normal - -	1, normal; 1, not found.	Abundant unwholesome conditions; above the average of those found in and about dwellings of same class.
...rmal up to 11th or 12th day, when inflammation began; erysipelas extended to trunk, legs, and opposite arm; later, abscess of left ankle, and lumps in right ankle and axilla; lastly, diarrhœa and convulsions.	Normal - -	10, of which 1 not traced; 7 normal (no measles in the house). One, 3rd week, angry, and lump found near spots, and broken; 4th week, healed. One, 3rd week, scabs knocked off and arm inflamed, healed subsequently. (Measles in house or next door in these two abnormal cases.)	Vesicles not opened	Measles very prevalent in locality, and some scarlatina. Case of acute ulcerated sore throat five doors off.
...abbed normally; end of 3rd week, one scab knocked off, and deepish sore left; soon after, inflammation, which spread; phlegmonous erysipelas, with abscesses and axillary swelling.	Normal - -	1, normal - - -	1, and 3 tubes taken; no other record.	Mother, who suckled child during illness, was taken ill with sore throat and fever, followed by abscess of submaxillary glands. No probable source of infection found.
...h day normal; 12th day, red blush *on anterior fold of axilla,* which extended generally.	Hime's calf-lymph "conserve."	7, at various times, with same sort of material, of which 3 somewhat undue inflammation, but not until after 8th day, and 1 was inflamed by 8th day, extending.	1, 2nd week, inflamed and ulcerated.	After inspection, Fuller's earth applied. Day before commencement of erysipelas (11th day) taken to house where grandmother had chronic ulcer of leg, in connexion with which she had had (but not recently) several attacks of erysipelas.
...mmencing inflammation within an hour of vaccination, rapidly increased with surrounding blisters, the discharge from which gave rise to fresh similar blisters; 7th day, confluence of vesicles, and whole deltoid region affected similarly.	Normal - -	1, 2 small normal vesicles, ½ insertions having failed. This child was vaccinated 4 days before deceased.	None - -	No explanation discoverable. First child of a rather delicate mother.
...h day, normal; end of 2nd week, "fresh blisters" round unbroken vesicles. Beginning of 3rd week inflammation round vesicles, soon extending down the arm, and axillary glands enlarged; 19th day, scabs loose, and covering deep ulcers.	Not to be accurately identified.	1, scabs knocked off, but healed practically by 33rd day.	Not opened -	Within 18 months 3 deaths had occurred in house, viz., husband from pneumonia, 1 child from diarrhœa, and 1 child from measles. On day of vaccination mother tried to rub out one spot with clean handkerchief wetted in her mouth, and on 9th day applied dairy cream with her finger. Three cases of typhoid fever within 350 yards of house.

r. Ballard's emorandum.

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CXXXII	E. B. -	days (Vaccinator); 8 days (mother).	3	Local Registrar -	April 25, 1890	Medical Officer of Workhouse. Arm to arm (vaccinator); tube (mother).	*Cellulitis and sloughing, following vaccination wound.*	About wee
CXXXIII	G. M. -	4 months -	?	Local Registrar -	Nov. 16, 1890	Public Vaccinator.	*Convulsions brought on by vaccination.* (*Inquest.*)	1 mon
CXXXIV	E. L. -	3 months -	1	Local Registrar -	Nov. 1, 1890	Private - - Calf-tube (Renner).	*Erysipelas, 2 weeks; exhaustion (vaccinated 3 weeks ago).*	3½ wee
CXXXV	— O. -	2 months -	?	Registrar-General -	Oct. 27, 1890	Private - - Tube (6 weeks old).	*Erysipelas following vaccination.*	23 day
CXXXVI	H. J. E. -	6 weeks -	4 (2 on each arm).	Local Registrar -	Oct. 28, 1890	Public Vaccinator.	*Erysipelas after vaccination, 10 or 12 days.*	21 day
CXXXVII	E. B. -	2 months -	4	Local Registrar -	Sept. 10, 1890	Public Vaccinator by deputy. Arm to arm.	*Erysipelas, 20 days (post vaccination, 16 days).*	5 week
CXXXIX	C. D. -	3 months -	2	Local Registrar -	Dec. 5, 1890 -	Private - - Tube.	*Vaccinia; erysipelas; exhaustion.*	17 days (mother
CXLI	G. A. -	20 days -	?	Local Registrar -	Sept. 19, 1890	Medical Officer of Workhouse.	*Vaccination, 16 days; erysipelas, 14 days.*	16 days
CXLII	F. B. -	16 days -	?	Local Registrar -	Sept. 20, 1890	Do. -	*Vaccination, 17 days; erysipelas, 12 days.*	17 days

Dr. Ballar Memorandi

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being suggested as Syphilitic), or Abscess (axillary or otherwise) occurred, or in which other conditions possibly ere suggested as in any degree concerned in the Death—*continued.*

h or in the record of the Cause of Death—*continued.*

n Illness commenced, l Progress of Disease. 10.	Vaccinifer. 11.	Co-vaccinees. 12.	Sub-vaccinees. 13.	Remarks. 14.
day, slight inflam- ation; subsequently eep sloughing sores nd cellular inflamma- on of arm.	Normal; but suffering from tabes mesenterica.	2, normal; 1, rubbed and healed slowly; 1, not found.	Not opened -	After inspection day mother occupied, with child and grandmother, small squalid room, reached by dirty stair. Child illegitimate. "Eyes bad when born." Mother unhealthy looking girl, "who had weak eyes during pregnancy." Child had no snuffles.
day, normal; 10th or 1th day, red and swol- n, subsequently im- roved, but arm did not eal; 22nd day, abscess axilla; died sud- enly in convulsions.	Normal - -	12, viz.:—9 normal; 2 healed slowly; 1 not found.	Vesicles opened -	Vaccinator careful and experienced. Child fed artificially, and teething.
day, normal; 11th ay, erysipelas com- enced round pock, nd extended generally.	Renner's calf -	No record - - -	No record -	Vaccinator described as a "cheap dispensary doctor," who keeps no record. Was when he vaccinated and inspected child (at its home) in attendance on a case of facial erysipelas next door, into which house mother had taken the child occasionally during the illness. Another child (bed fellow) taken with whooping cough in 1st week of E.L.'s vaccination.
day, normal; 11th ay, inflammation com- enced in arm; 12th ay, extended erythema nd diarrhœa; subse- uently erysipelas ex- nded generally over dy.	Normal. [Some remaining tubes out of 12 were opalescent in November].	7, of which 6 successful; 1 failed, but succeeded with another of the 12 tubes from same packet in possession of vaccinator.	No record -	New shield used. "Bow-pen" (double blades, which can be separated for cleansing), used for vaccination. Said by vaccinator to be cleansed between operations (?). No other explanation suggested.
day, redness began und vesicles *on left m only*, extending to oulder, and down ft side of body and mbs; 15th day, crusts ormal; lung symp- ms a day or two fore death.	Two removes from Board's calf.	5, of which 1 slight inflammation about spots.	Not opened - -	Vaccinating instrument, 4 needles lashed together between two slips of wood (? how satisfactorily cleaned). Some sanitary imperfections about house. Another child in the family had sore throat in middle of October, and other children in neighbourhood bad throats and swellings in neck. Diphtheria prevalent in town. Medical practitioners speak of district as "home of sore throat." Whooping cough in neighbouring house.
day, normal; 12th ay, scabbed over; 15th ay, redness *near spots;* 5th day, crusts fell, d subsequently ery- pelas extended gene- lly.	Normal - -	5 normal (no abnormalities of moment in vaccination practice in August).	No record -	Back to back house, with imperfectly disconnected waste pipe from sink. No infectious disease heard of in neighbourhood.
day, vesicles found oken and one inch of cola; 11th day, axil- ry swelling and redness ere and on shoulder, hich extended to unk; abscess broke.	No record -	1, normal - -	None - -	Father "syphilitic cirrhosis of liver" and a sister with "scrofula." Home very dirty, offensive, and comfortless. Several days accumulation of fœtid matter in pail in scullery, with which living room communicated.
day, erysipelas com- enced in vaccinated m.	No record - -	Several vaccinated arm to arm from same vaccinifer, normal, except CXLII.	None, of course -	These two infants vaccinated same day in ward in which mothers had been confined. This ward was furnished with bedding that had been lying for a week in another ward that had been occupied from June 8 to July 20 (6 weeks), *i.e.*, 6½ weeks prior to the vaccination, by a child suffering from erysipelas. But the ward is said to have been fumigated with sulphur, floor scrubbed, and mattress and clothing used by the sick child disinfected. Measles had broken out in children's ward of institution.
day, erysipelas in accinated arm.	No record -	Several vaccinated direct from arm of vaccinifer, normal, except CXLI.	None, of course -	

F. Ballard's Memorandum.

GROUP

Cases in which unusually severe Inflammation of the Arm, Erysipelas, Ulceration of the Vaccinated Places (such ulceration attributable to the introduction of Septic material were observed and appeared,

a. **In which Vaccination is mentioned in the Certificate of**

Number on List of Cases. 1.	Initials. 2.	Age when vaccinated. 3.	No. of Insertions. 4.	Reported by 5.	Date of Death. 6.	Vaccination, Public or Private. 7.	Registered Cause of Death (if certified, in *Italics*). 8.	Death how long after Vaccination. 9.
CXLV	H. C. H.	3 months	4	Local Registrar	Nov. 30, 1890	Public Vaccinator. Arm to arm.	*Erysipelas following vaccination*, 12 *days*.	4 weeks
CXLVI	J. W.	2 days	3	Local Registrar	Dec. 9, 1890	Medical Officer of Workhouse. Tube from Warlomont's calf.	*Vaccination; severe suppuration of arm; septicæmia.*	4 weeks
CXLVIII	E. E. R.	6 months	?	Local Registrar	Nov. 23, 1890	Public Vaccinator. Tube calf (Renner).	*Strumous ulceration after vaccination; bronchitis*, 10 *days*.	2 months
CXLIX	R. R.	2 months	?	Local Registrar	Dec. 5, 1890	Public Vaccinator. Arm to arm. 1 remove from Board's calf.	*Vaccinia*, 2 *months; erysipelas*, 6 *days*.	8½ weeks
CL	C. H. M.	3 months	?	Local Registrar	Nov. 25, 1890	Private - Tube from calf (Renner's); 12 days old.	*Erysipelas following vaccination.*	4 weeks
CLII	R. H. W. T.	11 weeks	2	Medical Officer of Health.	Dec. 17, 1890	Private - Arm to arm.	*Erysipelas after vaccination.*	21 days
CLIII	L. J. C.	1 month	4	Local Registrar	June 21, 1890	Public Vaccinator. Tube.	*Cellulitis following vaccination.*	10 days
*CLIV	J. C.	Infant	?	Complaint of Mother to Inspector.	June 1, 1890	Public Vaccinator of CXX. (I. *b.*)	Death attributed in some way to vaccination performed same day and place as CXX.	About 6 weeks
CLV	C. G. C.	3 months	1	Local Registrar	Nov. 23, 1890	Private - Tube.	*Vaccination*, 18 *days; erysipelas*, 7 *days.*	19 days

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Dr. Ballard's Memorandum.

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hen Illness commenced, nd Progress of Disease. 10.	Vaccinifer. 11.	Co-vaccinees. 12.	Sub-vaccinees. 13.	Remarks. 14.
failed. 8th day, vesicles normal; 2nd week, inflammation. By 17th day, erysipelas to shoulder, which subseqently spread considerably. Finally symptoms of meningitis.	Normal - -	5, normal - -	No record -	On 3rd day child circumcised for phymosis. Erysipelas did *not* attack this wound. Home and surroundings dirty and unwholesome. Child had been ill for a week, previous to vaccination, with diarrhœa.
day, normal; 15th day, scabbed over; same day, in the evening, vesicles found injured; 17th day, red and angry, and circumscribed cellulitis; later abscess, coalescence later still, croupy cough, and diarrhœa, wound having scabbed over.	Warlomont's calf -	3, normal - -	No record - -	Illegitimate child of destitute, idle, careless, and dirty mother. Clothing in which child discharged from workhouse 15th day, scanty and dirty. In evening of that day arm found sticking to dirty sleeve, and again on 16th day.
day, normal; a few days later pocks broke and discharged and ran together into one deep sore; inflammation of lungs during last two weeks.	Renner's calf tube lymph.	16, viz.:—4 not found; 12, normal; (2 others same day, arm to arm; normal also).	Vesicles not opened	Mother delicate; had "cracked nipples and erysipelas" on both sides when child was vaccinated. Child delicate; 2 others (1 dead), formerly had abscesses, and another epistaxis during whooping-cough. No suspicion of syphilis. Home dirty.
r 3 weeks after vaccination, redness and inflammation appeared round pocks, and gradually extended to left forearm, and across chest and neck to back.	Normal - -	9; 1 failed, rest normal -	11, all normal, but 1 of them had a slight rash a fortnight after vaccination, and another, strumous child, axillary abscess 3 months after vaccination.	Mother unintelligent and dirty. Before redness appeared and also later applied with naked finger lard and castor oil bought at grocer's. Poulticed subsequently. Dwelling abounding in unwholesome conditions. One sub-vaccinee residing in same house did well.
day, one of pocks broken and redness; th day arm somewhat inflamed, which soon extended generally as superficial erysipelas.	Renner's calf tube lymph (344 applicants supplied from same calf; no ill-effects reported).	1, normal - -	Vesicles opened for microscopical purposes only.	Mother suffering at time and previously from inflammatory sore throat. No other illness in house. Three days after vaccination, vaccinator first attended a case of erysipelas. Some diphtheria in the district.
day, normal; 12th ay, or a little later, light redness, which ncreased and extended enerally; by 20th day cabs fallen, leaving 2 eepish ulcers; finally, ronchitis.	Normal 8th day, but died 27th day from "Meningitis and Convulsions" (arm not inflamed).	No record - -	No record - -	New shield, used for some days from 4th day. Home a single dirty unventilated room in a house occupied by 3 families. Children in adjoining room had discharging abscesses in neck.
day, vesicles found roken and coalesced, nd surrounding skin flamed.	Normal - -	None. 22 other children vaccinated same day from other sources, normal.	None - -	Child's home an exceeding dirty and miserable hovel. Rupture of vesicles probably due to rough and careless nursing.
d had inflamed arm nd burst vesicles, also omiting and convulsions, but sickness had gun before vaccination.	Not same as CXX., but vaccinator careless in selecting vaccinifers.	Not stated, but *see* CXX. (I. *b.*) as to other children vaccinated at same time.	No record -	Home a small dirty unventilated room. Mother delicate, unwell at the time, and thought her milk did not agree. Father also delicate. Had previously lost an infant through some wasting disease. Mother's family history bad and phthisical. Vaccinators' vaccinations apt to be unduly inflamed.
k did not rise properly, but broke and scharged watery matter during 1st week; h day, ill; 7th day, flamed; 8th day, running sore; 10th day, ronchitis and erysipelas had extended, and ntinued to do so.	Not identified -	3 *possible* ones; 1 inflamed to elbow, and 2 delayed healing.	None - -	Vaccinator only operates in 1 place. New shield from 7th day. Father gouty. Mother looks delicate. Erysipelas prevalent in district during all year, but most so in November, when child was vaccinated. $\frac{5}{6}$ notifications of erysipelas were of infants, and in $\frac{2}{3}$ it was referred to vaccination, one of these 2 having been vaccinated while scarlatina was in house: the other case is CLVI. (I *b.*)

Dr. Ballard's Memorandum.

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CLIX	W. J. J.	10 days	3	Local Registrar	Jan. 15, 1891	Private - Tube.	*Vaccination; erysipelas.*	17 days
CLXIV	E. G. C.	3 months	3	Local Registrar	Nov. 23, 1890	Public vaccinator Arm to arm.	*Erysipelas after vaccination, 35 days.*	51 days
CLXVI	L. B.	3 months	2	Local Registrar	Feb. 13, 1891	Private - Arm to arm.	*Exhaustion from abscesses on arm, axilla, and breast, with sloughing after vaccination.*	4 weeks
CLXVII	M. I. W.	5 months	3	Local Registrar	Mar. 19, 1891	Private by public vaccinator. Tube.	*Erysipelas following vaccination.*	25 days
CLXVIII	E. K.	3 months	4	Local Registrar	Mar. 21, 1891	Public vaccinator Arm to arm.	*Vaccination, 23 days; erysipelas, 10 days; gangrene; convulsions, 2 days.*	17 days
CLXIX	E. W.	3 months	3	Local Registrar	Apr. 7, 1891	Public vaccinator Arm to arm.	*Vaccination, 28 days; cellulitis.*	7 weeks

Dr. Ballard's Memoranda.

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en Illness commenced, d Progress of Disease. 10.	Vaccinifer. 11.	Co-vaccinees. 12.	Sub-vaccinees. 13.	Remarks. 14.
day, one insertion nailed and one vesicle nsignificant, otherwise ormal; 9th day, even- ng, inflammation com- enced and erysipelas pread.	Uncertain - -	2 normal - - -	Vesicles pricked -	On same day as W. J. J. began to be ill, the father (who had been feeling ill some days before) was attacked with sore throat (to which he is said to be liable). The mother from five days before child's vaccination until after child's death suffering from a small constantly discharging abscess in her right ear.
3rd week abscess in rmpit, which broke; ubsequently erysipe- as. By 5th week, had xtended to fingers, eck, and chest, and accination spots co- lesced with sloughing.	Normal - -	1 normal - -	All vesicles opened, but lymph not used.	A first child of unintelligent dirty mother. About 7th day a coloured woollen shawl stuck to pocks, and to heal places, mother applied poul- tices, and with naked (? dirty) finger, assiduously, cold cream, linseed oil, and zinc ointment.
day, normal; 9th day, velling began at spots. y 16th day, erysipelas om elbow to shoulder, ck, scalp, and left de of face, with rge sloughing ulcer seat of vaccination, d later over pectoralis uscle, and abscess in illa.	Normal - -	Uncertain if any - -	Uncertain if any, but vesicles pricked.	Immediately after inspection, and sub- sequently, mother applied bread and milk poultices, and also Fuller's earth with a feather from a newly killed fowl, and also with her finger. Home very dirty. Instrument used by vaccinator for laying on lymph found by inspector covered with dried blood from a recent vaccina- tion.
lay, vesicles broken careless nursing, d sleeve stuck to ots. 8th day, some lness round them, hich did not begin to read until 15th day. timately erysipelas read extensively, but d nearly disappeared. days before death nvulsions, which con- ued until death, when bs were dried up and ing.	Part of N.V.E. tube	1, with part of same tube, which was then re- sealed. Quite normal. This child used as vac- cinifer without ill results.	None, vesicles not meddled with.	Teething when vaccinated. Recently recovered from bronchitis. Inspector found inside of sleeve of child's frock caked with yellow discharge. Some scarlatina in the district. In vac- cinating child the vaccinator blew lymph out on his thumb nail, but says it was clean, and he had not on that day been attending any surgical or puerperal case.
ay, normal. 9th day, ning, redness below ks, which soon ead generally in an atic manner. Pocks obed normally, and s remained normal death. A few days ore death, blisters owed by superficial ghs on buttocks re wetted by urine.	Vaccinifer doubtful. The registered vaccinifer sickly, and when seen filthy.	Actual co-vaccinees doubtful, but of 21 other children vacci- nated same day and place, all but one, whose arm got injured and healed slowly, did well.	Vesicles opened -	Vaccination register not to be relied on. Home in a foul low-lying con- fined yard with nuisances. Erysi- pelas very prevalent.
y, 2 pocks, normal. ourse of 3rd week lling in axilla. day, scabs (quite nal) forcibly pulled after which ery- las, which ex- ed greatly. Axil- swelling had sub- d before death.	Normal -	1 normal - -	Vesicles not opened	Until 2 days before death this child was attended by the unqualified assistant of the certifier, who on 19th day "to allow the matter free vent" pulled off the healthy scabs with his fingers. No other explana- tion of the illness is discoverable, except that it is noted that on day of vaccination, and also on day of inspection, a child was present from each of 2 families, members of which were suffering from measles.

Dr. Ballard's Memorandum.

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CLXXIII	C. F.	6 months	4	Registrar-General	Aug. 7, 1890	Public vaccinator Arm to arm.	*Vaccination 24 days; sickness and diarrhœa, 7 days.*	23 days
CLXXIV	E. A. D.	4 months	2	Local Registrar	Apr. 30, 1891	Private N.V.E. calf point.	*Post vaccinal papular eruption and bronchitis, convulsions.*	30 days
CLXXV	L. S. D.	4 months	4	Local Registrar	May 22, 1891	Public Vaccinator. Arm to arm.	*Vaccination, erysipelas, 13 days.*	18 days
CLXXVI	H. F. H	6 months	5	Local Registrar	Mar. 27, 1891	Dr. Cory Board's calf.	*Congenital debility, bronchitis, and exhaustion after vaccination.*	36 days
CLXXVII	R. J. G. M.	2 months	4	Registrar-General	Aug. 20, 1890	Public Vaccinator. Arm to arm.	*Vaccination, 11 days; convulsions.*	13 days
CLXXVIII	B. E. A	5 months	4	Registrar-General	Dec. 20, 1890	Public Vaccinator. Arm to arm.	*Vaccinia, erysipelas.*	17 days

*; But was the illness so sudden Th

Dr. Ballard's Memorandum.

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hen Illness commenced, d Progress of Disease.	Vaccinifer.	Co-vaccinees.	Sub-vaccinees.	Remarks.
10.	11.	12.	13.	14.
day, not risen much, and child said not to have been well; 9th and 10th days rose more satisfactorily, and went on to scabbing. Mother then applied sweet oil, after which (date unknown) erysipelas with diarrhœa, and vomiting; 2 days before death scabs fell, leaving sloughing sores.	Normal, but discrepant statements as to areolation on 8th day.	3, in each of which mothers said the vesicles had been injured by rubbing, which condition of scars corresponded with. A child vaccinated with stored lymph from a different source on same occasion had, after vesicles had been opened, an inflamed arm, which mother says, "broke out below like vaccinated places."	——	Recorded statements are of events 10 months previously. Vaccinator in habit of using areolated arms. The oil applied on one occasion only was purchased at a small village shop, and mother says it did not agree with arm, which thereupon inflamed. It might have been rancid. Home overcrowded.
day, slight areola; 9th day, child dull and cross, and at night vaccinated arm inflamed from shoulder nearly to elbow; 10th day, redness round anus. During 3rd week, bronchitis, inflammation of arm disappeared, but lump in axilla; subsequently a papular rash which became eroded in places.	N.V.E. calf point. No untoward results from use by other practitioners.	None, except those referred to in previous column.	Vesicles not opened	Charged points seen to be carelessly kept. Injury to punctured spots by removing on 2nd day lint that had dried on them. Dressings of cream repeatedly. Child exposed on inspection day to septic infection of various kinds in out-patient room of hospital. Had had bronchitis soon after birth, and mother says never really strong afterwards. Vaccinator on the morning of vaccination at patient's home had been attending a case of erysipelas, and after that day was in care of other cases in hospital and outside.
day, child sleepy; 6th day, "fits"; 7th day, erysipelas with burst vesicles. Erysipelas spread extensively and vesicles seemed to "abort," did not coalesce.	Normal - -	19, of which 13 normal, 1 dead of bronchitis, rest not found.	Vesicles not opened	Father had sore throat from 2 days before child's vaccination, and abscess in throat broke the day before the child appeared ill.
day, pocks very small from delay of development. By 31st day, pots (not burst) had run into one; by 33rd day, extensive phlegmonous erysipelas, with one large deeply reaching dry blackish mass at seat of vaccination. No satisfactory evidence of bronchitis.	Board's calf -	63, of which 56 normal, but 7 somewhat delayed.	Vesicles not opened	A puny very weakly artificially fed child of epileptic mother, whose 2 former infants had died. Vaccination had been postponed and would have been well postponed again. Home surroundings not unexceptionable, and might have assisted in the production of mischief. But the interpretation perhaps to be put upon the phenomena is that the local hurt terminated (principally in consequence of the child's general weak condition) in local death of the vaccinated part with accompanying septic infection. Dr. Copeman (inspector) regards the sudden* illness after 30 days as due to "something superadded to vaccination," and the local death as the result of the erysipelas.
day, normal; 10th day, erysipelas from shoulder to wrist; skin round vaccination places said to have assumed a black colour with little blisters round about. Convulsions before death.	Normal - -	3 normal - -	1 normal - -	Scarlatina in neighbouring cottages in same row, with free family intercommunication.
day, normal; 11th day, redness and swelling, and erysipelas extended largely. Convulsions before death.	Normal - -	4, of which 3 normal, but 1 of them had died subsequently from teething, and bronchitis. 1 not found.	Vesicles not opened	Child always delicate and bottle-fed. Home unclean; mother also unclean, and wanting in intelligence. She could not recollect (6 months after events) whether arm was abraded at all after inspection. Scarlatina in district, but not in immediate neighbourhood.

sent depends on grandmother's credibility.

Dr. Ballard's Memorandum.

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CLXXIX	D. C.	6 months	4	Local Registrar	Apr. 11, 1891	Public Vaccinator. Arm to arm.	*Vaccination, diffuse cellulitis and pneumonia.*	61 day
CLXXX	P. K.	2 months	4	Registrar-General	Oct. 30, 1890	Public Vaccinator. Tube.	*Erysipelas following vaccination.*	24 day
CLXXXII	S. J. L.	4 months	3	Local Registrar	Apr. 5, 1891	Public Vaccinator. Arm to arm.	*Erysipelas following vaccination.*	5½ wee
CLXXXV	V. G.	3 months	?	Registrar-General	Dec. 19, 1890	Private	*Erysipelas 1 month; vaccination 35 days.*	35 day
CLXXXIX	H. B.	3 months	3	Public Vaccinator to Inspector.	Mar. 23, 1891	Public Vaccinator. Renner's calf lymph.	*Erysipelas vaccination.*	27 day
CXCI	A. M. J.	3 months	3	Local Registrar	June 13, 1891	Public Vaccinator. Arm to arm.	*Vaccination 22 days; erysipelas 13 days.*	23 day
CCXII	W. H. H.	2 months	4	Local Registrar	June 28, 1891	Public Vaccinator. Arm to arm.	*Vaccinia 13 days; erysipelas 4 days.*	17 day

Dr. Ballard's Memorandum.

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10.	11.	12.	13.	14.
inspected; but by 7½ eeks, 2 crusts still dherent, from beneath ne of which (that had een inflamed during st week) there was ozing of matter. ome axillary swelling fter 3rd week. ubsequently, when en at 7½ weeks, erysi- elas from vaccinated ots down left side groin; 8 weeks ter vaccination, pneu- onia.	Normal - -	3 normal. During some weeks prior and subsequent to this vaccination, various irregularities in course of vaccinia at this station but none serious.	Vesicles not opened	A delicate bottle-fed child in a dirty and untidy home, and a few yards away an overflowing offensive privy.
day normal, but pro- bly areolated; 9th y began to inflame d erysipelas spread tensively, with diar- ioea.	Normal - -	2 said to be normal, but 1 died 4 or 5 months after of bronchitis. Others vaccinated same day also normal.	Doubtful - -	One of the other children suffering from whooping cough at time of child's vaccination. Serious nuisances outside dwelling. Mother attacked with severe erysipelas 11 days after child's death and 5 days after its burial.
day normal. In 3rd ek (2 places having aled) 1 spot inflamed d erysipelas extend- over limbs and unk, and spot healed. onvulsions preceded ath.	Normal, but died 2 months after S.J.L., of bron- chitis.	8 normal; but 1 died May 15, from lung disease.	Doubtful if opened. Mother says tubes were taken, but no record of it.	Unwholesome surroundings of home. Whooping cough rife in immediate neighbourhood, and some scarlatina in adjacent streets.
ipelas began about week after vaccina- n and spread exten- ely. Death from haustion.	Nothing known -	1, twin; isolated when erysipelas appeared in sister, and did well.	None - -	An imperfect account of case from the medical man, who could scarcely speak with certainty about any of the details. Vaccination done with instrument used for other purposes. Scarlatina prevalent in immediate neighbourhood.
8th day commencing ysipelas. In 2nd ek spread exten- ely, pocks burst aving sores which ver healed.	Renner's calf tube	$\frac{6}{6}$ normal. $\frac{1}{6}$ punctured 8th day; "eczema" commenced near pocks in 2nd week and spread on arm. When crusts fell angry sores left which did not heal for several weeks. Sub-vaccinee of this last case and others normal.	Vesicles not opened	Home at an inn with various unwholesome surroundings. Child by day kept in dirty tap room and bagatelle room frequented by bargemen. Unusual number of cases of erysipelas about that time in the place, and vaccinator visited one on vaccination day and day before.
day normal; 9th day ld poorly; 10th day m swollen and red m shoulder to elbow. course of 2nd week ysipelas extended eatly. Pocks scabbed er 14th day and re- ained on until death.	Normal - -	$\frac{5}{6}$ normal. $\frac{1}{6}$ where home and family were dirty, redness and swelling in 2nd week, and sores formed.	$\frac{2}{3}$ vesicles punctured and tubes taken (?) but not used.	On 8th day $\frac{2}{3}$ vesicles punctured; 10th day (probably earlier) castor oil and cream applied with finger; subsequently "cold cream" rubbed on with feather. Filthy cesspool closely abutting on house.
slowly and pocks all. Ill on 12th day, en redness in neigh- urhood of pocks ich quickly disap- ared (probably nor- l areola). On 14th y *erysipelatous blush shoulder*, none about cks, which had rmal scabs. By 16th y marked erysipelas served on shoulder d chest (but not out pocks), which ead. Scabs normal.	Normal - -	$\frac{2}{6}$ normal, $\frac{4}{6}$ abnormal, viz.:— F.B., burst 3rd day, forming slowly healing sores. F.W., 8th day normal and used as vaccinifer; 9th day some inflammation (not serious) and 2 vesicles coalesced. F.K., 8th day normal. Middle of 2nd week inflammation neck to wrist, soon disappeared. D.S., 8th day normal. Used as vaccinifer. During 2nd week redness, 2 places coalesced and sores formed. Shield used.	None. Not opened; but subsidiary sub-vaccinees normal.	Illegitimate. Had had thrush and eczema which had not disappeared when child was vaccinated. Nothing amiss discoverable in previous or subsequent history of the lymph. Cause of these $\frac{4}{6}$ abnormal cases on June 11th, and not before nor after, not discovered, but something common in conditions of time and place must have been operating.

Dr. Ballard's Memorandum.

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a. In which Vaccination is mentioned in the Certifica...

Number on List of Cases. 1.	Initials. 2.	Age when vaccinated. 3.	No. of Inser-tions. 4.	Reported by 5.	Date of Death. 6.	Vaccination, Public or Private. 7.	Registered Cause of Death (if certified, in *Italics*). 8.	Deat... how long ... Vaccina... 9.
CXCIII	C. A. M.	14 days	4	Local Registrar	Sept. 5, 1891	Medical Officer of workhouse.	*Acute bronchitis; vaccination.*	25 days
CXCIV	H. S.	1 month	4	Local Registrar	June 10, 1891	Locum tenens of Public Vaccinator. Arm to arm.	*Vaccinia*	7 week
CXCV	N. H.	4 months	3	Local Registrar	Sept. 5, 1891	Public Vaccinator. Arm to arm.	*Vaccination*, 21 *days; erythema, exhaustion.*	22 day
CXCVI	H. C.	3 months	2	Inquest noted by Inspector.	Oct. 22, 1891	Private - - Arm to arm.	*Septicæmia after vaccination, probably from the use of tainted cream as a dressing.* (*Inquest.*)	21 day
CXCVII	M. T.	2 months	2	Registrar-General	Aug. 19, 1890	Private - - Tube.	*Erysipelas after vaccination.*	About ... week
XCVIII	L. D.	2 months	1	Registrar-General	July 7, 1890	Private - - Tube.	*Erysipelas after vaccination, 14 days; exhaustion.*	27 day

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Dr. Ballard's Memoranda.

being suggested as Syphilitic), or Abscess (axillary or otherwise) occurred, or in which other conditions possibly ere suggested as in any degree concerned in the Death—*continued.*

th or in the record of the Cause of Death—*continued.*

en Illness commenced, l Progress of Disease. 10.	Vaccinifer. 11.	Co-vaccinees. 12.	Sub-vaccinees. 13.	Remarks. 14.
day normal, and well hen taken out of orkhouse: 9th day hite heads between laces without inflam- ation; 16th day these roke, coalesced, and y 18th day formed ne large ulcer with ffensive discharge and nflamed and brawny ound, and redness om shoulder to elbow: 3rd day cough, and round beginning to eal. Convulsions efore death.	Calf tube lymph (Warlomont's).	Several; removed from workhouse before 8th day, but up to time of leaving normal.	None - - -	Illegitimate. Taken from workhouse on 7th day in a nightgown, sleeves of which were "not particularly tight," to a lodging in filthy dirty blind alley. Mother and child at that time dirty. On 9th day, and subsequently, arm dressed with vaseline (old and used for various purposes) on rag, sometimes (at least) removed with violence. Certifier says he should have returned cause of death as "septic pneumonia."
y 1 pock rose, 8th day, ormal; 14th day, re- accinated in one place, other arm, unsuccess- lly. Beginning of 3rd eek "new vesicles" egan about the primary ne, and coalesced with , but only transient dness. 29th day, scab ll, leaving large weep- g surface. A general milar eruption in ops in various parts body shortly after e accessory ones on m, which resembled accinia.	Normal, but some- what undue areola.	Normal, but some inser- tions failed.	None - -	Shield used, but not until arm had become bad. Mother in bed with phlegmasia dolens, when child was vaccinated; but she had no offensive discharge. One of mother's sisters had advanced phthisis. Family other- wise healthy. Inspector could hear of no varicella in neighbourhood.
day, normal; 10th y, commencing ery- pelas, which extended eatly; 11th day, con- ulsions; subsequently tense exhaustion.	Normal - -	5 normal - -	Not opened - -	Inspection day very rainy. Home an offensively ill-ventilated tumble-down cottage in a court, very damp, and with w.c. nuisances. Mother anæmic pasty faced woman. Another child strumous, and with eczema.
day, normal, and free om redness. After- ards (date uncertain), it apparently in 2nd 3rd week, pocks irst, and sores acquired nched-out appear- nce; 19th or 20th day, sh like measles; 22nd y, found dead in bed.	Normal (1st remove from trade calf).	Yes, but vaccinator keeps no record.	None - -	Child puny, and ill-nourished from birth, and had been under mercurial treatment for syphilis; vaccination had better have been postponed. Mother for some time ailing with "sore eyes, and especially from sore throat." Cream applied to burst vesicles. Another child, with measles, in the house where child died, but not when child was vaccinated.
day, much inflamed; 2th day, inflammation gan to extend and read extensively.	Not ascertainable -	No record - -	Pocks opened, and tubes taken.	Vaccinated and inspected by unqualified practitioner, who took lymph in tubes from the arm. From 8th day, poultices, cold cream, and cream applied. Erysipelas prevalent in district. [excviii., cxcix., and cc. were cases occurring in same Union about same time.]
day, arm swollen and flamed, and erysipelas ttended generally over dy and limbs. Symp- ms of peritonitis to- ards the end.	Not ascertainable -	No record -	Not opened - -	The vaccinator vaccinates daily at his surgery in one small place for 6*d.*, "as his only chance of competing with "the Public Vaccinator," and says usually from arm to arm. Erysipelas prevalent in district, and diphtheria in same road; suspected case of diphtheria (child's brother) shortly before child's vaccination in same house. Father, as a journeyman size maker, liable to be personally pol- luted with putrid matter. (*See also* CXCIX., I. *b.*, by same vaccinator on same day.)

Dr. Ballard's Memorandum.

GROUP [illegible]

Cases in which unusually severe Inflammation of the Arm, Erysipelas, Ulceration of the Vaccinated Places (such ulceration attributable to the introduction of Septic material were observed and appeared

a. In which Vaccination is mentioned in the Certificate of

Number on List of Cases. 1.	Initials. 2.	Age when vaccinated. 3.	No. of Insertions. 4.	Reported by 5.	Date of Death. 6.	Vaccination, Public or Private. 7.	Registered Cause of Death (if certified, in *Italics*). 8.	Dea how lon after Vaccina 9.
CCI	G. B. -	5 months -	4	Local Registrar -	Aug. 4, 1891	Public Vaccinator. Tube.	*Infantile decay*, 14 *days*; *exhaustion from ulcerated arm after vaccination.*	27 day
CCII	C. W. H. L.	3 months -	4	Local Registrar -	Sept. 20, 1891	Public Vaccinator. Arm to arm.	*Vaccinia*, 27 *days*; *erysipelas*, 17 *days*; *axillary abscess*, 14 *days*,	27 day
CCIII	R. E. M. -	3 months -	4	Local Registrar -	Nov. 16, 1891	Public Vaccinator. Arm to arm.	*Vaccination*, 6 *weeks*; *cellulitis*, 14 *days*; *exhaustion.*	42 day
CCIV	S. S. -	2 months -	4	Local Registrar -	Nov. 21, 1891	Public Vaccinator. Arm to arm.	*Vaccinia, septicæmia, broncho - pneumonia.*	24 day

b. Cases in which Vaccination is not mentioned in the Certificate of Death, but in which it was ascertained

LIX	P. J. S. -	7 months -	?	Registrar-General -	Jan. 12, 1889	Public Vaccinator. Arm to arm.	*Pyæmia* -	4½ wee
*LXII	C. M. W. -	3 months -	?	Father - -	Nov. 19, 1888	Public Vaccinator. Tube taken same day.	*Diffuse cellulitis.*	8 week
*LXIII	E. M. H. -	4½ months -	4	Mr. Young in "Echo."	Feb. 16, 1889	Public Vaccinator. Tube taken same day.	*Strumous diathesis*; *bronchitis.*	4½ wee
LXIV	E. M. H. -	4 months -	?	Local Registrar (addition by registrar).	Feb. 12, 1889	Public Vaccinator. Arm to arm.	*Bronchitis*, 7 *days*; *erysipelas of arm*, 4 *days*; *convulsions*, 2 *hours.*	3½ wee

Dr. Ballard's Memorandum.

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being suggested as Syphilitic), or Abscess (axillary or otherwise) occurred, or in which other conditions possibly ere suggested as in any degree concerned in the Death—*continued.*

ch or in the record of the Cause of Death—*continued.*

en Illness commenced, d Progress of Disease.	Vaccinifer.	Co-vaccinees.	Sub-vaccinees.	Remarks.
10.	11.	12.	13.	14.
day, normal. In 2nd eek, two lower scabs, r scabbing vesicles, rn off, and the places lcerated, the two upper nes scabbing natu- lly.	N. V. E. tube -	7 normal; 2 not found -	Not opened -	Mother of weak mind. Child feeble from birth, and vaccination once postponed on account of additional weakness after measles. Home dirty and ill-ventilated, in a close London court, reported to Metropolitan Board of Works as unfit for human habitation.
day, normal, and free om redness, when ocks were opened. In ourse of 2nd week, rulent discharges and rysipelas, which by th day had spread tensively, with oughing sores, and mmencing abscess in cilla which was opened 23rd day.	Normal - -	3 normal - -	2 normal; 1 died of bronchitis; 1 scabbed pocks injured, but otherwise normal.	Mother's history showed special liability to erysipelas. On 6th day of child's vaccination she had sore throat, and subsequently facial erysipelas, probably by extension from fauces. Home unclean, with adjacent privy nuisance, and probably tainted water supply. On 8th day, pocks anointed by mother's finger with dairy cream that had stood all day in dirty house. Scarlet fever prevalent in town. The sub-vaccinee that died had bronchitis when vaccinated.
day, normal. About d of 3rd week red- ss, and then ulcera- n of pocks, forming, 30th day, 4 sloughing cers, with cellulitis, hich spread to fingers d trunk.	Normal - -	1 normal - - -	3 normal, except one that became rubbed and healing then delayed.	Directly scabs began to fall mother, to expedite healing, rubbed into arm zinc ointment, diachylon, and various other things. Child wore a coloured dress. Certifier considers the tampering with the arm, and its neglected condition set up the diseased action.
day, normal. About d of 2nd week scabs bbed off, and then lness began about ces, which ulcerated. en abscess in palm right hand, and der right ear. On nd day, palmar scess was opened, and sloughing ulcers had arly coalesced.	Normal, but puny -	3 normal - - -	Vesicles not opened	Child when brought to hospital was dirty and looked neglected. On appearance of redness mother applied bread poultices and yellow ointment. Home, a crowded ill-ventilated room, with foul atmosphere, in a tenement house, dirty, and abounding in nuisances of most serious nature.

gistrar-General, Local Registrar, or Board's Inspector, or otherwise to have been recently performed.

day, vesicles small, t no inflammation; bsequently small bs rubbed off; sores not heal; still r arm inflamed, l abscess in both ee joints.	Normal - -	4 normal - -	Vesicles not punctured.	An illegitimate, scrofulous, neglected child put out to nurse; measles (unattended) a month before vaccination, which had been twice postponed.
day, commencing are- ; 6th day, vesicles oken; 8th day, in- ned; in course of l week, erysipelas ended to trunk, legs, l head.	Excessive areola on 8th day.	None - -	None - -	Public Vaccinator habitually gets areolated arms and uses them; unwholesome surroundings of residence; boils, abscesses, and fever about locality from bad drainage.
day, normal; 2nd k, inflammation, ich spread; 4th k, bronchitis.	Normal - -	1 normal - -	1 normal - -	Vulvitis since birth; severe and ulcerated on 11th day of vaccination: 3 days before death, bronchitis from exposure to cold; arm and vulvitis healing; mother had septic uterine discharge shortly before child's vaccination; shield used.
on well until 19th , when bronchitis urred; redness next *top of shoulder*, and n extended to wrist; lly convulsions.	Normal - -	1 normal - -	Vesicles not opened	2 other children unvaccinated and unhealthy; 2 others dead; child slept in same bed with father, who had sore discharging leg, and mother, who had recent sore throat.

Dr. Ballard's Memorandum.

GROUP

Cases in which unusually severe Inflammation of the Arm, Erysipelas, Ulceration of the Vaccinated Places (such ulcera attributable to the introduction of Septic material were observed and appeared.

b. Cases in which Vaccination is not mentioned in the Certificate of Death, but in which it was ascertained by

Number on List of Cases. 1.	Initials. 2.	Age when vaccinated. 3.	No. of Insertions. 4.	Reported by 5.	Date of Death. 6.	Vaccination, Public or Private. 7.	Registered Cause of Death (if certified, in *Italics*). 8.	Death how long after Vaccination 9.
LXV	S. C.	2 months	2	Noted by Inspector	Aug. 10, 1889	Public Vaccinator. Same batch of tubes as XXXI., I.a.	*Erysipelatous inflammation, marasmus, exhaustion.*	4 week
LXVII	M. L.	3 months	3	Local Registrar	Oct. 6, 1889	Public Vaccinator. Arm to arm.	*Erysipelas*	5 week
LXVIII	A. P.	5 months	?	Registrar-General	Dec. 2, 1888	Public Vaccinator. Preserved lymph, 6 months old.	*Septicæmia*	2 mon
LXIX	A. C. E. L.	6 months	?	Local Registrar	June 6, 1889	Public Vaccinator at *private dispensary.*	*Abrasion of arm; irritation; erysipelas, 10 days.*	2½ wee
LXX	H. E. H.	2 months	4	Local Registrar	June 26, 1889	Private, by a Public Vaccinator. Tube lymph 4 months old.	*Pyæmia; exhaustion.*	4½ mon
LXXI	M. A. B.	4 months	3	Local Registrar	Feb. 21, 1889	Private - Tube.	*Lymphadenitis and abscess; exhaustion.*	4 wee
LXXV	A. R. T.	2 months	3	Local Registrar: supplemented by practitioner.	Nov. 12, 1888	Private	*Blood poisoning, 2 months.*	10½ w
*LXXVII	E. P.	1¼ years	3	Mr. Young, anti-vaccinator.	Nov. 15, 1888	Locum tenens of Medical Officer of Workhouse.	*Sloughing ulceration; measles.*	5½ we
LXXVIII	A. J. P.	2 months	4	Local Registrar	Apr. 12, 1889	Public Vaccinator's assistant.	*Convulsions, pyæmia.*	19th d
LXXIX	E. F. D.	3 months	2	Local Registrar	Apr. 17, 1889	Public Vaccinator's assistant.	*Pyæmia, exhaustion.*	24th d

Dr. Ballard's Memorandum.

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…eing suggested as Syphilitic), or Abscess (axillary or otherwise) occurred, or in which other conditions possibly …re suggested as in any degree concerned in the Death—*continued.*

…trar-General, Local Registrar, or Board's Inspector, or otherwise to have been recently performed—*continued.*

…s Illness commenced, Progress of Disease. 10.	Vaccinifer. 11.	Co-vaccinees. 12.	Sub-vaccinees. 13.	Remarks. 14.
…re of one spot; …day, inactive super- …ial sore at the other …t, without redness …inflammation, but …re was redness and …elling *of forearm*, …ich extended largely; …sequently blisters …med on left instep, …ttock, and labia.	No record (believed to be same as XXXI.).	XXXI. vaccinated from same batch of tubes.	None - -	Public Vaccinator blamed by Inspector on previous visit. *See* remarks on XXXI. (I. *a.*)
…week (scabs fallen …d healed); two days …fore scabs fell erysi- …as *commenced at* …ow and spread, but …round the scars.	Normal - -	3 normal - -	Vesicles pricked 8th day, but lymph not used.	House dirty with unwholesome surroundings.
…ay, vesicles became …bbed; 2nd week, in- …mmation; erysipelas …ensive.	Normal - -	2 (?) failed; subsequent vaccination, normal.	No record, probably none.	Mother had a suppurating sore at time of child's vaccination; child delicate, $\frac{4}{5}$ other children dead of convulsions; half a year later, father had thecal abscess. Premises with defective drainage.
…day, severe inflam- …tion and blisters on …osite arm, extend- …afterwards to vac- …ated arm and on …ly.	No record -	No record - -	No record -	Crowded dispensary; some patients having suppurating sores, and room offensive. Vaccination under these circumstances encompassed with dangers.
…day, vesicles small, …hout inflammation; …1 week and subse- …ently, abscesses in …ious parts; vaccinated …ces formed one large …e.	Not stated -	Not stated - -	1 normal - -	Dirty house and family; father a knacker; effluvia from bones and flesh; certifier considers pyæmia due to this cause.
…8th day, excessive …ola; 13th day, scabs …med and inflamma- …n spread to shoulder, …l later on to pectoral …ion, where an abscess …med.	Not learned -	1 (?) normal - -	No record, probably none.	Measles in neighbourhood, and 2 months before, in the house.
…day, inflammation …ulder to elbow, re- …vered; 19th day, …nchial catarrh, and …a few days a shot- …e papular eruption …body, with ulcer on …f of mouth. Erup- …n apparently con- …ued till death.	Calf lymph (Warlemont); vaccination with similar lymph the week before having failed.	No record - -	No record, probably none.	Certified "blood poisoning," because certifier said he did not know what else to ascribe death to; vaccination not regarded by Inspector as concerned in illness or death.
…s coalesced into one …ge sloughing ulcer; …week, measles.	Could not be found; same vaccinifer as LXXVI., (III. *b.* 1.)	1, vaccination normal, but measles on 12th day, and recovered; 1 other measles, LXXVI.	No information -	Several cases of measles in the institution.
…day, vesicles found …oken. …day, vesicles found …oken.	Tubes from same child, normal, except that 2 vesicles had burst.	6: of which on 8th day, 1 had broken vesicle and later on inflammation; 1 had broken vesicle, later on inflammation and axillary abscess; 4 normal. (All ultimately did well.)	None - -	Vaccination performed during an epidemic of scarlatina; manifold cases among vaccinated children and others. [A series of cases given where, *in association with scarlatina or after exposure to scarlatina prevalence*, vesicles burst before 8th day, or inflammation or erysipelas or other mischief happened; *see also* series of 5 cases in Table of Complaints.]

Dr. Ballard's Memorandum.

GROUP I.—

Cases in which unusually severe Inflammation of the Arm, Erysipelas, Ulceration of the Vaccinated Places (such ulceration attributable to the introduction of Septic material were observed and appeared.

b. Cases in which Vaccination is not mentioned in the Certificate of Death, but in which it was ascertained by the

Number on List of Cases. 1.	Initials. 2.	Age when vaccinated. 3.	No. of Insertions. 4.	Reported by 5.	Date of Death. 6.	Vaccination, Public or Private. 7.	Registered Cause of Death (if certified, in *Italics*). 8.	Death how long after Vaccination 9.
CXXVII	H. J. S.	5 months	4	Noted by Inspector.	Nov. 11, 1889	Public Vaccinator. New points, 2 days old.	*Erysipelas*	4 weeks
XCI	A. A. D.	3 months	2	Registrar-General	June 14, 1889	Private	*Pyæmia, 14 days*	4 weeks
XCII	E. S. H.	4 months	4	Registrar-General	Nov. 10, 1889	Public Vaccinator. Tube lymph; 6 months old.	*Blood poisoning*	2½ weeks
XCVII	E. B.	5 months	?	Registrar-General	Dec. 22, 1888	(?)	*Septicæmia*	Probably 2 months
XCVIII	W. F.	2 months	?	Registrar-General	Dec. 20, 1888	Private	*General œdema*	3 weeks
C	S. E.	5 months	?	Noted by Inspector.	Dec. 5, 1889	Public Vaccinator.	*Blood poisoning*	8 weeks
CI	R. M.	7 months	?	Noted by Inspector.	Oct. 31, 1889	Public Vaccinator.	*Catarrh, some days.*	2 weeks
CIII	E. C.	7 days	3	Registrar-General	Nov. 13, 1889	Medical Officer of workhouse. Tube lymph 3 months old.	*Septicæmia, exhaustion.*	31 days

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being suggested as Syphilitic), or Abscess (axillary or otherwise) occurred, or in which other conditions possibly ere suggested as in any degree concerned in the Death—*continued.*

strar-General, Local Registrar, or Board's Inspector, or otherwise to have been recently performed—*continued.*

a Illness commenced, Progress of Disease.	Vaccinifer.	Co-vaccinees.	Sub-vaccinees.	Remarks.
10.	11.	12.	13.	14.
day, normal; 14th y pocks dried up; th and 26th day, sipelas about upper rt of arm and spread tensively; for some days before child l not appeared well.	Normal - -	14 normal, and some of them furnished lymph which produced no bad results.	None, and vesicles not pricked.	Child did not appear well after a visit to Yarmouth on 15th day; no shield or dyed clothing; about time child took ill there were at least 4 persons ascertained to be ill with erysipelas in neighbourhood, one close to child's home.
ay, normal; 17th to h day inflammation, ch spread exten- ely; abscesses formed various places; lly pneumonia.	Calf lymph (Warlomont's) tube.	No statement -	Vesicles opened 8th day.	Mother and home very dirty; mother had several discharging abscesses in her breast; had been applying dirty linen, china clay, cream, and other substances to child's arm.
les normal on 8th ; 10th or 11th day, chitis began; 16th , an apparently mal inflammation ead, and erysipelas noted, but some bt as to order of bid conditions.	Tube lymph (6 months old); vaccinifer normal.	1 normal (with tube lymph 1 year old from same source).	Doubtful if vesicles opened; mother *thinks* they were pricked.	Vaccinator did not hear of illness until several months after death; unwholesome home conditions; dirty house; foul atmosphere from overcrowding; a badly nourished unhealthy child.
nformation available hat arm was long in ling, and that there axillary abscess d 3 or 4 weeks r vaccination.	? - -	No information - -	No information -	Little information obtainable, as both parents and certifier had left the locality; information obtained from certifier's assistant; probably septic infection through an open sore.
y, normal; on 18th certifier saw child diffuse superficial mmation of vacci- d arm and side.	Normal - -	No information - -	6, normal, and no erysipelatous blush.	Mother had mammary abscess at time of child's vaccination; she (against medical advice) continued to suckle child from bad breast, and it is said by child's aunt that some of the discharge found its way into vesicles opened on 8th day; certifier says he should have described cause of death "Diffuse Cellulitis."
ay, red; 5th day, med arm; 8th day, h inflamed; about week, transient rash puffiness of arms feet; by 4th week, sipelas found ex- ed over arm and t; abscess in a; confluence of s into one ulcer.	Not ascertainable -	Not ascertainable, but of 13 other children vaccinated at same place and on same occasion 2 others died, viz., CI. and CII., and rest were more or less abnormal, *i.e.*, inflammation, scarlatina-like rash, &c.	No reliable information, but vesicles pricked.	A delicate ill-nourished child. This was one of 5 fatal cases (LXI., LXVI., C., CI., and CII.) out of 40 vaccinations performed at two stations on different days in one periodical vaccination attendance, and noted by Inspector during his inquiry into a complaint of injury from vaccination. The vaccinator was 80 years of age, mentally deranged, and reckless in his non-observance of the Board's Instructions.
8th day, restless poorly; by 8th extensive erysipe- which commenced *shoulder and back*; ination vesicles ely rose, but ele- ns broke and dis- ged.	Not ascertainable -	Not ascertainable (*see* Case C., *supra*).	No reliable information.	*See* observations, Case C., *supra*.
d 15th day, quite al; by 27th day, se redness and ing, and foul un- hy crusts on arm; multiple abscesses phlegmonous infil- on of tissues of .	Normal - -	21, of which, 1 unsuccessful, 12 normal, 8 not found.	No record - -	Mother and child left establishment on 15th day; not known what became of them for next 12 days; mother a dirty, ill-conditioned, destitute woman, addicted to standing about in the street with the child in her arms.

Dr. Ballard's Memorandum.

Geo I.–

Cases in which unusually severe Inflammation of the Arm, Erysipelas, Ulceration of the Vaccinated Places (such ulcera attributable to the introduction of Septic material were observed and appr

b. Cases in which Vaccination is not mentioned in the Certificate of Death, but in which it was ascertained by th

Number on List of Cases. 1.	Initials. 2.	Age when vaccinated. 3.	No. of Insertions. 4.	Reported by 5.	Date of Death. 6.	Vaccination, Public or Private. 7.	Registered Cause of Death (if certified, in *Italics*). 8.	Date how lo after Vaccin
CIV	H. M. R. -	2 months -	4	Medical Officer of Health.	Mar. 10, 1890	Public Vaccinator. Arm to arm.	*Erysipelas; exhaustion.*	21 d
CV	J. .	4 months -	4	Inspector - -	April 11, 1890	Public Vaccinator. Tube kept 1 week.	*Blood poisoning* (inquest).	23 d
*CVII	No. 70 on Public Vaccinator's register.	5 months -	3	Secretary of Anti-Vaccination League; complaint to President.	April 1, 1890	Locum tenens of Public Vaccinator. Tubes.	Pyæmia -	21st
*CVII (a)	No. 83 on Public Vaccinator's register.	2 months -	3	Secretary to Anti-Vaccination League; complaint to President.	April 10, 1890	Locum tenens of Public Vaccinator. Tubes.	Convulsions -	24 d
*CXVIII	M. W. -	5 months -	2	Clerk to Guardians	May 15, 1890	Public Vaccinator. Arm to arm.	*Septicæmia* -	19 d

Dr. Ballard's Memorandum.

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s being suggested as Syphilitic), or Abscess (axillary or otherwise) occurred, or in which other conditions possibly were suggested as in any degree concerned in the Death—*continued.*

egistrar-General, Local Registrar, or Board's Inspector, or otherwise to have been recently performed—continued.

When Illness commenced, and Progress of Disease.	Vaccinifer.	Co-vaccinees.	Sub-vaccinees.	Remarks.
10.	11.	12.	13.	14.
insertions failed; 8th day, 2 good vesicles without areola; child at inspection feverish with some redness *about inner canthus of right eye* (vaccinated side); 9th day and following days erysipelas extended to head, face, and neck; comatose and convulsed finally; *no erysipelas at vaccinated spots.*	15th day (same day as H. M. R.), erysipelas began around vaccinated spots, and extended to body and opposite arm; recovered.	4 normal - -	No record -	Mother had lost 5 years ago another child (unvaccinated) from erysipelas following inflammation of eyes. Vaccinifer and vaccinee lived in same street, and Public Vaccinator was attending a case of idiopathic erysipelas in neighbouring street; complaints of offensive midden privies overflowing in the locality; instruments not in fault; no ill result among 29 other children present when H. M. R. was vaccinated.
insertion failed; 20th day, internal pains and convulsions; arm scabbed over; erysipelas, which spread; scabs came off after poulticing and lotion, leaving sores.	Precise source unknown, but it was one of 5 children all of which were normal.	8 normal (none of 24 children vaccinated on 4 weekly periods, from March 4 to March 25, were ill, except J. S.).	Vesicles not opened	Bread poultices applied 8th day to 11th, and then cold cream; poulticing again on 20th day; child had had convulsions previously, and also ophthalmia some weeks before vaccination; mother lost 3 children previously and 3 living are deformed, or ricketty. Sanitary conditions unsatisfactory; drain air entering house. Inquest exonerated vaccinator. [The medical practitioner who made post-mortem examination stated cause of death "general septic poisoning, due to absorption of some septic material at an abraded surface." There were evidences of pericarditis, peritonitis, and meningitis.]
h day, vesicles burst, inflamed round them; worst on 12th day; 13th day, leg swollen above knee, extending to rest of limb, buttocks, and back.	Not accurately known, but almost certainly inflamed arm.	14 other children vaccinated same day, but not certain if from same vaccinifer, had early inflammation, burst vesicles, and axillary abscesses (illnesses mostly commencing in 1st week).	Vesicles not opened.	These are two of a series of 26 vaccinations *performed by a locum tenens* at 4 different stations on 4 different days, *all* of which were abnormal in the way of burst vesicles, erysipelas, abscess, inflammation commencing (*mostly in 1st week*) from 1st or 2nd day onwards. The vaccinations were started by N.V.E. tube lymph. The solitary vaccinee on the 5th March had inflammation on 8th day, and in course of 2nd week, deep discharging sores, yet lymph from this was used largely for vaccination in succeeding weeks, in the course of which other lymph from similarly inflamed arms seems also to have been used; the N.V.E. lymph was from unexceptionable vaccinifer, and in other hands produced no abnormal result; results of Inspectors' inquiries into health histories of vaccinees, sanitary surroundings, &c., were negative; no evidence of personal infectiveness of vaccinator; but the instruments he used were improper, and used for other than vaccination purposes, thus affording opportunity for introduction of septic material, and he did not cleanse them between operations.
d or 4th day, vesicles burst and arm inflamed from shoulder to elbow, subsequently inflammation subsided and spots dried up; 23rd day, convulsions recurring till death.	Not accurately known, but almost certainly inflamed and damaged arm.	14 other children vaccinated same day, but not certain if from same vaccinifer, had early inflammation, burst vesicles and abscesses (inflammation commencing 1st or 2nd day).	Vesicles not opened.	
vening of day of vaccination, redness round scratches; 3rd day, vesicles discharging; 5th day, extended to elbow and then to trunk and other arm.	Normal on 8th day, but 9th day, inflamed; inflammation spread, scabs renewed several times; on 14th day, eyes inflamed, and, from neglect, one permanently damaged.	5 abnormal—2 of them had inflammation after 8th day; 2 of them burst vesicles, and early inflammation; 1 axillary abscess on 7th day. [One other same day, from source unknown, was worst case of all].	None, of course -	About the day M. W. was vaccinated, case of erysipelas came for advice to the surgery, where Public Vaccinator vaccinated. The day before M. W.'s vaccination, Public Vaccinator visited for first time a very bad case of erysipelas. Sanitary condition of district very unsatisfactory, and there had recently been very much enteric fever.

Dr. Ballard's Memorandum.

GROUP

Cases in which unusually severe Inflammation of the Arm, Erysipelas, Ulceration of the Vaccinated Places (such ulcer... attributable to the introduction of Septic material were observed and appe...

b. Cases in which Vaccination is not mentioned in the Certificate of Death, but in which it was ascertained b...

Number on List of Cases.	Initials.	Age when vaccinated.	No. of Insertions.	Reported by	Date of Death.	Vaccination, Public or Private.	Registered Cause of Death (if certified, in *italics*).	Death how lo... after Vaccina...
1.	2.	3.	4.	5.	6.	7.	8.	9.
CXX	J. W. E.	3 months	4	Local Registrar	May 24, 1890	Public Vaccinator of cliv. Arm to arm.	*Erysipelas, 1 month.*	5 weeks
CXXI	T. W. A.	2 days	?	Registrar-General	Jan. 19, 1890	Public Vaccinator.	*Pyæmia, 2 weeks; asthenia.*	1 month
CXXIX	E. M. A.	1 month	4	Local Registrar	Aug. 24, 1890	Public Vaccinator. Arm to arm.	*Scrofula*	11 mon...
CXLIII	J. B. A.	3 months	2	Local Registrar	May 25, 1890	Private - Tube.	*Pyæmia; erysipelas.*	4 weeks
CXLIV	C. E. B.	5 months	2	Local Registrar	June 30, 1890	Private - Tube; Renner's calf lymph.	*Gangrene of arm; convulsions.*	3 weeks
CLI	E. H.	3 months	4	Father to Board	Nov. 17, 1890	Public Vaccinator. Arm to arm.	*Erysipelas*	26 days
CLVI	[illegible]	2 months	4	Noted by Inspector.	Aug. 19, 1890	Public Vaccinator. Arm to arm.	*Erysipelas*	10 weeks

Dr. Ballard's Memorandum

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being suggested as Syphilitic), or Abscess (axillary or otherwise) occurred, or in which other conditions possibly were suggested as in any degree concerned in the Death—*continued.*

istrar-General, Local Registrar, or Board's Inspector, or otherwise to have been recently performed—*continued.*

en Illness commenced, l Progress of Disease.	Vaccinifer.	Co-vaccinees.	Sub-vaccinees.	Remarks.
10.	11.	12.	13.	14.
day, 1 vesicle found roken (by rubbing?) at morning; slight reola only; 10th day, xillary abscess, broke n 15th day; subse-uently erysipelas gan *about abscess* d spread generally; ually convulsions.	Normal, but 2 out of 4 vesicles had burst on 7th day through rubbing; in 3rd week, axillary abscess occurred, attributed to a fall.	7, all more or less inflamed arms; one living in dirty house, near which erysipelas was, had axillary abscess; another had burst vesicles with inflammation about 5th day, and also whooping cough. *See also* CLIV. (I. *a.*).	Not opened - -	Vaccinated places poulticed from 10th day; vaccinator careless in selecting vaccinifers and vaccinations apt to be attended with undue inflammation; vaccinator not sufficiently careful to avoid using pocks with conspicuous areola; surgery where vaccinations are done is open to chance of septic infections; possibility described of exposure to scarlatina and erysipelas infections. (*See also* CLIV.)
cination normal up to ith day; after which ceration and axillary bscesses.	No record - -	10 said to have done well	No record -	Seven months' child, puny, and probably syphilitic. Ought not to have been vaccinated.
th week after vaccina-n 4 ulcers, and area inflammation hard; upper and 2 lower ots severally coales-d; subsequently en-ged axillary glands; n healed by 11th ek. Six months after cination, whooping ugh and chicken pox, d boils about body; rious evidences of rofula.	Normal; (mother of vaccinifer had 3 other children; 1 died of convulsions; 1 a deaf mute, with strabismus; 1 had boils after whooping cough).	2, normal - -	None, and not opened.	$\frac{3}{12}$ of other children dead (thrush 3 months; scarlatina 16 months; "bad liver" 1 week). Tendency to skin affections and phthisical taint in family. Offensive nuisances at rear of house.
ay, normal, also on th day, and not in-med, but a *nævus* on ht leg (not a seat of cination), was angry l swollen, and *ery-elas spread from this* l pus formed in right ee joint; *vaccinated n not inflamed.*	No record -	No record - -	Not opened -	A strumous first child with 2 nævi, hand-fed; rash on nates at birth; erysipelas in house 10 months previously; scarlatina prevalent in neighbourhood. Shield used.
day, normal; 10th , inflammation, ich spread exten-ly, and axillary elling.	Renner's calf lymph	None - - -	Vesicles opened 8th day, lymph not used.	No gangrene, but "phlegmonous erysipelas;" measles had been prevalent in district, but not near child's home; only $\frac{2}{3}$ of the mother's children living (1 having been still born).
day, one broken icle, according to ther, but "nothing ably irregular" ac-ding to vaccinator; l week, erysipelas, ch spread exten-ly, notwithstanding by 27th day (that leath) 3 places had led and only 1 had still adherent; ery-las *does not appear to e commenced about* ks but in forearm.	Normal - -	1 normal - - -	None - -	Other cases of erysipelas in neighbourhood, scarlatina also; vaccinator had been visiting a scarlatina case on morning of child's vaccination; dirty home and neighbouring ashpit nuisances.
ocks healed, but 2, e opened on 8th , did not, but formed ning sores, which bed from time to . Erysipelas began 0th week, *near the* , where there had previously a sore, extended largely.	Normal, but infant as well as mother and house filthy in the extreme.	1, normal - - -	6, viz., 3 normal, 1 retarded healing, 2 not found.	Erysipelas prevalent, moreover mother had had erysipelas some 7 or 8 months previously in another house from which she might have brought fomites.

Dr. Ballard's Memorandum.

GROUP —

Cases in which unusually severe Inflammation of the Arm, Erysipelas, Ulceration of the Vaccinated Places (such ulcera… attributable to the introduction of Septic material were observed and appea…

b. Cases in which Vaccination is not mentioned in the Certificate of Death, but in which it was ascertained by…

Number on List of Cases. 1.	Initials. 2.	Age when vaccinated. 3.	No. of Insertions. 4.	Reported by 5.	Date of Death. 6.	Vaccination, Public or Private. 7.	Registered Cause of Death (if certified, in *Italics*). 8.	Death how long … Vaccinat… 9.
CLXXII	G. C.	4 months	4	Notified to Board by the Public Vaccinator.	April 21, 1891	Private by Public Vaccinator at Public Station (counted in this Report among Public Vaccinations). Arm to arm.	*Erysipelas*, 16 *days*; *pneumonia*, 2 *days*.	30 days
CLXXXVIII	L. A. C	4 months	4	Registrar-General.	June 25, 1890	Public Vaccinator. Arm to arm.	*Blood poisoning*, 1 *week*.	15 day…
CXC	S. A. S.	3 months	3	Medical Officer of Health.	June 17, 1891	Public Vaccinator. Arm to arm.	*Erysipelas* (*head and neck*); *exhaustion*.	33 day…
CXCIX	B. E. W.	3 months	1	Discovered by Inspector.	July 20, 1890	Private	*Erysipelas*; *convulsions*.	About … wee…
CC	C. L. P.	2 months	4	Discovered by Inspector.	Aug. 21, 1890	Public Vaccinator. Arm to arm.	*Erysipelas*; *diarrhœa*. (There was no diarrhœa.)	16 day…

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ng suggested as Syphilitic), or Abscess (axillary or otherwise) occurred, or in which other conditions possibly suggested as in any degree concerned in the Death—*continued.*

rar-General, Local Registrar, or Board's Inspector, or otherwise to have been recently performed—*continued.*

Illness commenced, rogress of Disease. 10.	Vaccinifer. 11.	Co-vaccinees. 12.	Sub-vaccinees. 13.	Remarks. 14.
lay, redness and ling; 7th day, red- to elbow, pocks imperfectly and d; 8th day, each an open sore. Sub- ently erysipelas ex- ted to all parts pt head. Two days re death it had ppeared, but child pneumonia.	Normal - -	9, of which 5 (4 being early consecutive numbers on register) normal; 1 rose imperfectly, vesicles broken by 8th day, and subsequently erysipelas and axillary abscess; 1 on 10th day, redness and swelling from shoulder halfway to elbow, with lump on breast (a sub-vaccinee of this case normal); 1 on 12th day, erysipelas and axillary swelling; 1 on 10th day "rose rash" lasting 2 days. All recovered.	None - -	Careful and full inquiry failed to discover source of G. C.'s abnormality, or of that of the co-vaccinee (No. 316), which was also abnormal on 8th day. The two attacked on 10th and 12th days might have acquired infection from G. C. on day of inspection at station. The "rose rash" in one of co-vaccinees might have been merely an instance of an occasional occurrence in vaccinated children. Public Vaccinator a most careful vaccinator. No infectious disease in district.
, redness; 8th day, ased with swelling; week, extended to der and elbow, scence of vesicles ulceration.	Normal - -	4 normal - -	Vesicles opened -	Home damp, dark, ditty, and ill-ventilated. Child after vaccination frequently taken into a house where was a case of measles.
week (?) axillary s. During 2nd inflammation, spread; heads of s came off after cing, leaving s.	Normal - -	Not recorded; but the co-vaccinees of first vaccination (which failed) were all normal.	1 normal -	Vaccination a week previously failed. Home miserable, filthy, one-roomed cottage, with abundant unwholesome surroundings. Scarlatina and erysipelas prevalent in place and neighbouring parts.
lay, apparently al. End of 2nd inflammation and elas spread gene- over body and .	Not ascertainable -	No record -	Not opened -	Same cheap vaccinator as CXCVIII, (I. *a.*) who vaccinates in 1 small place for 6*d.* Arm dressed with cream after 8th day. Erysipelas prevalent in district, and other subsequent cases (not among vaccinated children) in same road.
, normal. About day, when pocks drying up, in- ation commenced them, and the elas spread down and to trunk; p" in back and on genitals.	Normal - -	2 normal - - -	Tubes taken but not used.	Erysipelas prevalent in district. Mother had "sore throat like diphtheria" very shortly before child's vaccination.

Dr. Ballard's Memorandum.

GROUP II.

Cases alleged in Certificate of Death to have been Syphilitic (whether actually so or not) or

a. In which Vaccination is men

Number on List of Cases. 1.	Initials. 2.	Age when vaccinated. 3.	No. of Insertions. 4.	Reported by 5.	Date of Death. 6.	Vaccination, Public or Private. 7.	Registered Cause of Death (if certified, in *Italics*). 8.	Dea how lon Vaccin 9
XLV	V. R. B.	3 months	1	Registrar-General	Nov. 25, 1888	Private	*Specific eruption of skin; sequela of vaccination, 14 days.*	3½ we
XLVI	B. S.	6 months	3	Registrar-General	Dec. 2, 1888	Public Vaccinator. Arm to arm.	*Syphilis, 5 months after vaccination.*	5½ mo
XLVII	M. M. T.	4 months	5	Local Registrar	Mar. 10, 1889	Public Vaccinator.	*Vaccination, 2 months; since wasting, convulsions.*	8 we
XLVIII	F. N.	1 month	4	Local Registrar	Aug. 18, 1889	Public Vaccinator. Tube lymph 2 weeks old.	*Vaccine syphilis?*	3½ w
XLIX	J. H. W.	2 months	3	Local Registrar	Nov. 20, 1889	Public Vaccinator. Arm to arm.	*Vaccination; syphilis, exhaustion.*	8 we
XC	E. M. C	3 months	3	Report of inquest	July 1, 1889	Public Vaccinator's assistant. Preserved lymph.	*Syphilis acquired at or from vaccination.* (Inquest.) (Recognised as syphilis by the staff of Leeds Infirmary.)	14

Dr. Ballard's Memorandum.

GROUP II.

lieved by the Board's Inspector to have been Syphilitic (whether so registered or not).

Certificate of Death.

Illness commenced, rogress of Disease. 10.	Vaccinifer. 11.	Co-vaccinees. 12.	Sub-vaccinees. 13.	Remarks. 14.
g abnormal noted t pocks.	No record -	No information - -	No record -	Because the eruption was believed o have been subsequent to vaccination certifier regarded vaccination as cause; but it was actually found on inquiry to have preceded the vaccination. Case of congenital syphilis.
healed normally; 2 ths after vaccination philitic rash; never local chancre.	Normal - -	3 normal; 2 not found -	None - -	Common case of congenital syphilis; diagnosed as syphilis at Children's Hospital.
ent nursing and les probably in- l; about 12th day, inflamed and 3 he vesicles soon sced into one large without induration enlargement of ary glands.	Normal - -	2 normal - -	No record -	Congenital syphilis so diagnosed at Children's Hospital 4 weeks after vaccination; soon after birth "snuffles" and rash on buttocks still existent at time of vaccination. Mother had 1 miscarriage and 1 child still-born; one child died of "consumptive brain," and 2 out of 4 living have a strumous aspect.
y; an injury, re- g in swollen leg, vaccine vesicles jured; on 21st blebs below knee, of which burst ng a sloughing also on leg, ankle, one of fingers h also burst and ores; those on foot finger said to have umbilicated ut redness, like ne vesicles on 3rd h day (?); on day e death, sloughing under tongue.	Normal - -	5 normal - -	No record -	Almost all local mischief in lower half of body; probably injury to femoral vein. No reason for suspecting syphilis. The account of first blebs below knee given by Medical Officer of a hospital; the account of the rest by the medical man who thought it was syphilis.
y, fugitive erup- of red spots; after eks, aphthæ, diar- , abscess on ck.	Normal; parents also.	3 normal; 1 not found -	No record -	Post-mortem; normal vaccination scars; arms normal; little excoriation and abscess in buttock. No evidence of syphilis; mere thrush and diarrhœa. Mother had sore nipple and was treated with mercury because child was ill.
8th day, eleva- (not vaccine s) rose, and other ead elevations them broke and ogether, forming a hing sore.	Normal - -	7 normal; 1 not found -	None - -	Syphilis certainly not acquired at vaccination. Family history suspicious. Home surroundings wholesome. Not regarded as syphilitic by Mr. Hutchinson

Dr. Ballard's Memorandum.

GROUP II.—

Cases alleged in Certificate of Death to have been Syphilitic (whether actually so or not) or

a. In which Vaccination is me

Number on List of Cases. 1.	Initials. 2.	Age when vaccinated. 3.	No. of Insertions. 4.	Reported by 5.	Date of Death. 6.	Vaccination, Public or Private. 7.	Registered Cause of Death (if certified, in *Italics*). 8.	Dea... how ... Vacci...
CXLVII	F. B. T. -	7 weeks -	5	Local Registrar -	May 21, 1890	Dr. Cory - Tube, from Board's calf.	*Syphilis (congenital) or through vaccination; exhaustion.*	9 mo...
							b. In which Vaccina...	
LXXII	C. T. -	3 months -	?	Local Registrar -	Mar. 14, 1889	Public Vaccinator. Arm to arm.	*Ulceration of arm, 11 weeks* (8 weeks really); *exhaustion.*	2 mo...

Dr. Ballard's Memorandum.

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lieved by the Board's Inspector to have been Syphilitic (whether so registered or not)—*continued.*

Certificate of Death—*continued.*

Illness commenced, rogress of Disease.	Vaccinifer.	Co-vaccinees.	Sub-vaccinees.	Remarks.
10.	11.	12.	13.	14.
of the insertions d; 8th day 3 small vesicles; al; scabbed pro-; 4 months later mouth and ecze-ns eruption spread it over face and , infecting mother's and breast. Some ths later, diarrhœa thrush.	Board's calf tube -	6, of which 2 normal, 4 not found.	None, of course -	No evidence of syphilis. It was a contagious eruption of some kind which infected mother's nipple, so that child had to be fed artificially, from which time it fell away, and had at last diarrhœa and thrush. Child not treated constitutionally at St. Thomas's Hospital.
ntioned in the Certificate of Death.				
ks after vaccina-patch of redness ulceration seen scabs.	Normal - -	2 normal; 2 not to be traced.	No record - -	Child had snuffles prior to vaccination. Parents syphilitic. Certifier and Inspector both regard case as "congenital syphilis."

Dr. Ballard's Memorandum.

Group III.

Miscellaneous Cases, *i.e.*, such as

a. In which Vaccination is mentioned in the Cert

Number on List of Cases. 1.	Initials. 2.	Age when vaccinated. 3.	No. of Insertions. 4.	Reported by 5.	Date of Death. 6.	Vaccination, Public or Private. 7.	Registered Cause of Death (if certified, in *Italics*). 8.	Dea how lon Vacci
							(1.) Eruptive	
xxxvi	W. A. S.	4 months	?	Local Registrar	Oct. 19, 1889	Public Vaccinator.	*Scarlet fever; vaccination; phlegmonous erysipelas.*	19 da
lxxxix	C. B.	5 months	?	Registrar-General	Nov. 2, 1888	Public Vaccinator.	*Vaccinia*, 17 *days; scarlatina*, 9 *days; erysipelas*, 9 *days.* (Classed with scarlatina by Registrar-General.)	17 da
cxii	S. J. M.	3 months	?	Local Registrar	Mar. 12, 1890	Public Vaccinator.	*Measles* 2 *weeks; abscess stated to arise from vaccination.*	3 mo
clxxxiv	J. L.	1 month	?	Local Registrar	May 23, 1891	Public Vaccinator.	*Vaccinia*, 9 *days; measles.*	9 da
							(2. Di	
i	P. B.	6 months	4	Registrar-General	Nov. 1, 1888	Public Vaccinator. Arm to arm.	Father states "convulsions probably owing to vaccination."	9 da
ii	B. T. N.	1 month	?	Registrar-General	Dec. 25, 1888	Private	*Convulsions, 3 weeks after vaccination.*	4 wee
iii	M. O.	3 months	?	Local Registrar	Jan. 29, 1889	Public Vaccinator. Arm to arm.	*Vaccination*, 14 *days* (21 days really), *bronchitis; convulsions*, 2 *days.*	3 wee
iv	H. R. P.	3 months	?	Local Registrar	Feb. 3, 1889	Public Vaccinator	*Vaccination*, 14 *months; convulsions*, 3 *months.*	14 mo
v	E. C.	3 months	?	Local Registrar	Feb. 5, 1889	Public Vaccinator. Arm to arm.	*Broncho-pneumonia*, 10 *days; convulsions*, 10 *hours; vaccination.*	2 wee
vi	J. J.	3 months	3	Local Registrar	Mar. 27, 1889	?	"Convulsions, vaccination, with doubtful effect." (Uncertified.)	5 da
vii	E. P.	5 months	?	Local Registrar	Apr. 1, 1889	Public Vaccinator.	*Convulsions, vaccination.*	8-9 m
viii	T. R.	4 months	2	Local Registrar	June 2, 1889	Private (by a public vaccinator). N.V.E. tube.	*Vaccination; brain disturbance; shock to system; facial and cervical paralysis and collapse.*	10 w

Dr. Ballard's Memorandum.

GROUP III.

cluded in Groups I. or II.

or in the record of the Cause of Death.

lness commenced, ogress of Disease. 10.	Vaccinifer. 11.	Co-vaccinees. 12.	Sub-vaccinees. 13.	Remarks. 14.
OPING COUGH.				
, normal; 9th day, 10th, swelling older; 11th day, tina and erysi- together.	Normal - -	1 normal - -	1, broken vesicles and late crust, perhaps from careless nursing.	No information how infection received, but in one family represented at vaccination inspection there was diphtheria; scarlatina recently in neighbouring house.
, nothing amiss d; 10th day, inal rash and elatous blush vesicles, which l, and case termi- with congestion gs.	Not stated - -	4 normal; several others vaccinated from other sources same day, all of which did well.	None -	Child had been exposed a few days before illness to scarlatina infection.
tion did well, but cks later small s on scalp, which and healed, and on buttock; es taken from 2½ months after nation.	Normal - -	2, of which 1 normal; the other failed, both remained healthy.	No record - -	Child ill-cared for; home a squalid dark ill-ventilated room.
normal, no rash ed; 9th day, on of measles urried breathing; lay, died.	Normal - -	2 normal - -	1 normal (and escaped measles).	Measles in neighbouring houses. Death due to measles, probably complicated with broncho-pneumonia.
D CONDITIONS.				
, normal; 9th day, convulsions?	Normal - -	1 normal - -	None (lymph taken, but not used).	Vesicles normal; coroner considered no inquest necessary; probably child accidentally suffocated.
tion normal; con- ns 4 weeks after nation, child died day.	Not stated -	Not stated - -	No statement -	Had had convulsions previously to vaccination; a previous child had also died from convulsions.
y, normal; 2nd fretful; 3rd week, fretful, convul-	Normal - -	4 normal - -	Vesicles not punctured.	A neglected illegitimate child, no evidence of convulsions being due to vaccination.
tion not abnormal; rious times after- , eczema, summer hœa, teething, and convulsions.	Not stated - -	Not stated - -	No record -	Vaccination mentioned to humour mother; food shield used; nurse ascribed various ailments to teething.
itis next day, sub- ntly meningitis, convulsions.	Normal - -	1 normal; 2 unduly inflamed (?).	No record -	Vaccination not regarded as concerned in death.
days constipation, zing, &c., &c.; convulsions.	Normal - -	1 (? others also), normal -	No record -	Vesicles had hardly risen; illness apparently independent of vaccination; child hand fed; and bowels left unrelieved for several days.
ation was progress- ormally when con- ons occurred.	Not ascertained -	Not ascertained - -	No record -	Medical attendant and parents agreed that there was no relation between vaccination and death; child had had convulsions several times prior to this attack; teething.
y, eruption like e-stings on face, , arms, and legs; by 8th day; 10th inability to swal- face drawn, col-	Normal; N.V.E. lymph.	Lymph from same source produced satisfactory results in other hands.	No record -	

Dr Ballard's Memorandum.

Group II.

Miscellaneous cases, i.e., such cases

a. In which Vaccination is mentioned in the Certificate.

Number on List of Cases. 1.	Initials. 2.	Age when Vaccinated. 3.	No. of Insertions. 4.	Reported by 5.	Date of Death. 6.	Vaccination, Public or Private. 7.	Registered Cause of Death (if certified, in *Italics*). 8.	Dth. how long Vacc
IX	C. H.	3 months	?	Local Registrar	July 10, 1889	Public Vaccinator.	*Vaccination, convulsions, diarrhœa.*	6 d
XI	F. W.	4 months	3	Local Registrar	Nov. 2, 1889	Public Vaccinator.	*Vaccination*	18 d
XIII	C. M. E. L.	4 months	1	Local Registrar	Nov. 30, 1889	Private - Preserved lymph "recently taken."	*Vaccination, 9 days; vomiting and diarrhœa, 2 days; exhaustion.*	9 d
XIV	A. T. P.	3 months	?	Local Registrar	Dec. 23, 1889	Public Vaccinator.	*Bronchial catarrh, 14 days; hepatitis, 3 days; vaccinated on 9th instant.*	14 d
L	E. M.	7 months	3	Registrar-General	Dec. 10, 1888	Public Vaccinator.	*Vaccination, 1 month; marasmus, 1 month.*	3½ w
LI	T. W. T.	2 months	2	Local Registrar	Mar. 16, 1889	Private; tube	*Vaccination; convulsions.*	5½ w
LV	E. S. L.	3 months	?	Local Registrar	June 24, 1889	Public Vaccinator's partner.	*Vaccination, 6 days; convulsions, 6 days.*	6 da
LVI	V. E. E. C. (girl).	7 weeks (twins.)	?	Local Registrar	July 23, 1889	Private ?	*Thrush, 8 weeks; blood-poisoning (vaccinia); 7 weeks exhaustion.*	6 we
LVII	C. (boy)	6 weeks	2	Noted during Inspector's inquiry.	End of June	Private - Preserved lymph.	Exhaustion	
*LXXIV	C. F.	4 months	3	Father complained of death after vaccination with Board's calf lymph.	Nov. 10, 1889	Dr. Cory	*Death from natural causes.* (Inquest.)	19 d
XCV	J. A. C.	?	?	Registrar-General	Oct. 1, 1889	An army surgeon at Dover.	*Blood - poison (after vaccination); exhaustion.*	? but certainly more than mon
XCVI	B. E.	4 months	?	Registrar-General	Aug. 21, 1889	Public Vaccinator. Arm to arm.	*Phthisis, consequent on vaccination, 4 months; convulsions, 1 month.*	8 mo

Dr. Ballard's Memorandum.

nued.

s included in Groups I. or II.—*continued.*

ath or in the record of the Cause of Death—*continued.*

n Illness commenced, Progress of Disease. 10.	Vaccinifer. 11.	Co-vaccinees. 12.	Sub-vaccinees. 13.	Remarks. 14.
sed Conditions—*continued.*				
lay, diarrhœa -	Normal - -	1 normal - -	No record -	Unwholesome home; neighbours suffered from diarrhœa, and 1 infant not vaccinated died in same street from diarrhœa about same time.
ination went on rmally, except for pture of vesicles in d week from careless rsing; died of constitutional debility.	Normal - -	1 normal - -	Vesicles not punctured.	Puny ricketty infant ailing from birth: children of family ricketty, $\frac{5}{7}$ dead; strophulus before vaccination; no reason for naming vaccination as cause of death; but child ought not to have been vaccinated when so ill and weak, even at wish of mother.
day, vesicles normal, rrhœa; 9th day, nvulsions.	Not stated - -	2, normal - -	Vesicle not meddled with on 8th day.	Father states that 4 years ago they lost another child, aged 8 months, from similar short illness unassociated with vaccination.
chitis, apparently time of vaccition.	Not stated - -	Not stated - -	No record -	Certifier did not wish to imply that vaccination had anything to do with the death, but thought it right to mention it.
day, normal; 11th y, broken vesicles.	Normal - -	3, normal - -	Vesicles not punctured.	A feeble child, whose vaccination had been previously postponed, and had better not have been vaccinated; a previous child had died from "wasting" in nowise connected with vaccination.
day, normal; 15th y, vaccination spots d up; blebs near cination spots, which urred in crops elsere, resembling vace vesicles; convulns preceded death.	Not recorded -	Apparently none -	No record - -	Case obscure (varicella? history somewhat like CLXII).
lay, convulsions -	Normal - -	2, normal - -	None, of course -	Bottle-fed; diarrhœa, but seemed well at time of vaccination.
inia, normal, one sicle only rose; rush and eczema at ne of vaccination.	Calf (trade) lymph	Not known - -	No record -	Weakly, premature twin children, hand-fed; had thrush when vaccinated. Observe same symptoms fatal after vaccination with totally different lymph.
sh and eczema at time vaccination, but vacination normal.	Stored human lymph; source unknown.	Not known - -	None -	
ination normal; 18th y, convulsions.	Board's calf lymph	No irregularity reported -	No record - -	Convulsions independent of vaccination; father subject to "fits" in early life.
in 6 months of death, e removed for tuberlous infiltration of eball.	No record - -	No information - -	No information -	Certifier (a known opponent to vaccination) now dead; parents dirty, and of unsatisfactory habits; father a drunkard; children believed to have been neglected.
months after vaccition, vomiting and rrhœa; during dention, convulsions.	Not ascertained -	No information - -	No information -	Certifier a prominent anti-vaccinator who saw child first the day before death, says by "consequent on" he meant "following"; admitted that he gave certificate on hearsay evidence only, and confessed that he would have been inclined to alter his opinion had he known family history, which is markedly a consumptive one; other children "went off" in health after dentition.

Dr. Ballard's Memorandum.

GROUP II.—

Miscellaneous Cases, *i.e.*, such as cold

a. In which Vaccination is mentioned in the Certificate

Number on List of Cases. 1.	Initials. 2.	Age when vaccinated. 3.	No. of Insertions. 4.	Reported by 5.	Date of Death. 6.	Vaccination, Public or Private. 7.	Registered Cause of Death (if certified, in *Italics*). 8.	Death how long after Vaccination 9.
								(2.) C
XCIX	J. C. L.	2 months	?	Registrar-General	Oct. 5, 1889	Private	*Vaccination; acute eczema; asthenia.*	4 weeks
CLVIII	E. P.	9 months	2	Local Registrar	Mar. 10, 1891	Private - - Renner's calf tube.	*Teething; convulsions, 10 hours (vaccinated with fresh calf lymph, Mar. 3, 1891).*	8 days
CLX	J. H. M.	3 months	4	Local Registrar	Jan. 13, 1891	Public Vaccinator. Arm to arm.	*Pneumonia; vaccinia.*	8th day
CLXI	D. R.	12 weeks	?	Inquest	Feb. 11, 1891	Public Vaccinator. Arm to arm.	*Syncope due to exposure to the weather while suffering from a degree of irritation, the result of vaccination.*	8th day
CLXII	C. D.	5 weeks	4	Reported by Public Vaccinator.	Mar. 13, 1891	Public Vaccinator. Arm to arm.	*Vaccinia, 6 weeks; varicella, 3 weeks; exhaustion.*	44th day
CLXIII	F. M. W.	4 months	4	Local Registrar	Nov. 9, 1890	Public Vaccinator. Arm to arm.	*Vaccination, 9 days; erysipelas, 4 days.*	11th day
CLXV	E. D.	2 weeks	3	Registrar-General	May 19, 1890	Public vaccinator Arm to arm.	*Axillary abscess after vaccination; congestion of lungs, 4 hours.*	5 weeks
CLXX	K. I. B.	3 weeks	4	Local Registrar	June 6, 1891	Medical officer of workhouse. Tube 6 weeks old.	*Erythematous eruption, 2 days after vaccination; asthenia.*	9 days

Dr. Ballard's Memorandum.

nued.

e included in Groups I. or II.—continued.

ath or in the record of the Cause of Death—continued.

n Illness commenced, Progress of Disease.	Vaccinifer.	Co-vaccinees.	Sub-vaccinees.	Remarks.
10.	11.	12.	13.	14.
sed Conditions—*continued.*				
r 2 weeks rash on ites, scrotum, and dor- m of one hand, and re throat; broncho- neumonia.	Renner's calf lymph	No information -	Vesicles opened and lymph taken for vaccination of other children, who did well.	Rash was probably mere "intertrigo," and the aggravation of chest trouble due to an imprudent exposure to cold and damp; coroner was satisfied with this explanation, and declined to hold an inquest.
day, normal; 9th day, nvulsions, death.	Renner's calf tube	None - - -	Not opened - -	Vaccination had been twice postponed, once on account of bronchitis and once on account of eczema; dentition proceeding; five weeks before vaccination while cutting lower incisors, often moaned and screamed on waking up; was restless, and slept very badly; indications of neurotic family tendency.
day, found suffering om pneumonia; 8th y, convulsions.	Normal - -	1 normal - -	None - -	Certifier considered the pneumonia to be result of exposure on vaccination day (one of severe frost), and not in any way due to vaccination.
day, normal - -	Normal - -	9 normal (25 vaccinated from other sources, also normal).	No record -	Child after inspection carried about visiting friends until late in the evening, which was cold and windy; on reaching home found to be dead.
to 15th day, quite rmal; by 22nd day, upper and 2 lower ots severally coalesced, d by 29th day, all d coalesced and abbed, and apparently formation of inter- ning and circum- ential vesicles. From out 25th day, vesicles face, body, and in outh, like varicella.	Normal - -	3 normal - -	None - -	Chicken-pox prevalent in village; home damp, unclean, and with six very offensive ashpit privies at the end of the yard. See LI (III. *a*.)
ing amiss. No ery- elatous redness. On h or 6th day, child ain refused breast er indiscrete exposure night by taking a religious service; ooped apparently en then.	Normal - -	6 normal - -	None (not taken for inspection).	A first child: "refused breast, although mother had plenty of milk," a fortnight before vaccination. Certifier could give no account of erysipelatous illness, and said "there must have been some mistake." No infectious sickness in house or neighbourhood. Unwholesome and offensive surroundings of home.
lay, perfectly normal. ring 2nd week ooz- g from pricked sicles; 14th or 15th y, some swelling in illa, which soon dis- peared and vacci- ted spots healed; th day, influenza ke rest of family) d child died.	Normal - - -	1 normal - - -	Vesicles pricked, but not for use.	Parents did not accuse vaccination. Certifier states that he filled in cause of death under a misapprehension; he is of opinion now that child died from influenza.
lay, normal; 8th day, all patch of redness tween shoulders; 9th y, similar slight patch either side of neck; th day, suddenly died convulsions. Arm t inflamed at any ne, but normal up to last.	Normal - -	1 re-vaccination with similar tube, normal.	Vesicles not meddled with.	Puny illegitimate child of undersized anæmic untidy mother. Vesicles not injured in any way. Mother attributed erythema to friction from a blanket. Certifying practitioner did not regard redness as erysipelatous, nor wish to imply that it was caused by vaccination.

Dr. Ballard's Memorandum.

GROUP I.—

Miscellaneous Cases, i.e., such as

a. In which Vaccination is mentioned in the Certi

Number on List of Cases. 1.	Initials. 2.	Age when Vaccinated. 3.	No. of Insertions. 4.	Reported by 5.	Date of Death. 6.	Vaccination, Public or Private. 7.	Registered Cause of Death (if certified, in *Italics*). 8.	Dea how lon fr Vaccina 9.
								(2.)
CLXXXI	N. B. M. S.	1 month -	2	Local Registrar -	May 18, 1891	Private. Trade calf tube.	*Vaccination*, 4½ *months; blood poisoning*, 4 *days; afterwards convulsions*, 1 *hour.*	5½ mon
CLXXXVI	F. A. E. -	4 months -	3	Local Registrar -	May 21, 1891	Private - - Arm to arm.	*Morbus cordis; vaccinia; pneumonia.*	10 day
							b. In which Vaccination	
							(1.) ERUPTIVE F	
LXI	J. S. -	Not stated -	?	Noted by Inspector -	Nov. 8, 1889 -	Public Vaccinator.	*Whooping-cough*	4½ wee
LXXVI	A. P.	2½ years -	3	Mr. Young, anti-vaccinator	Nov. 11, 1888	Locum tenens of Medical Officer of Workhouse.	*Measles; ulcerative stomatitis.*	5 week
XCIII	J. L. -	5 months -	4	Registrar-General -	Aug. 1, 1889 -	Public Vaccinator.	*Septicæmia exhaustion.*	4½ mon
								(2.) Ca
LXVI	C. J. -	Not stated -	?	Noted by Inspector -	Oct. 22, 1889	Public Vaccinator.	*Catarrh some weeks.*	12 days
*LXXIII	S. R. M. -	5 months -	3	Father, to Lord Herschell.	July 28, 1889	Private -	*Meningitis* -	11 days
CII	F. C. -	2 months -	?	Noted by Inspector	Nov. 15, 1889	Public Vaccinator.	*Infantile convulsions.*	4 weeks

Dr. Ballard's Memorandum.

cluded in Groups I. or II.—*continued.*

or in the record of the cause of Death—*continued.*

ness commenced, gress of Disease.	Vaccinifer.	Co-vaccinees.	Sub-vaccinees.	Remarks.
10.	11.	12.	13.	14.
Conditions—*continued.*				
normal, and sub- tly also up to which was ayed. In course week some en- ent of cervical 3 months after tion otitis and ea. 5 months vaccination, ec- scalp and bullæ nd about trunk bs with glandu- argements, abs- angle of jaw nciation; hæ- ge from bowels last week of	Renner's calf lymph in tubes.	No ill consequence from use of lymph from same source by other practitioners.	Vesicles not opened	Mother delicate and strumous-looking. No suspicion of syphilis. Child had *before* vaccination been attended by public vaccinator for eczema of scalp. A previous child died at 10 months of "ulceration of stomach." This was apparently a case of struma.
ill with pulmo- ptoms; 8th day, rmal, no redness mmation at any hest symptoms rse; 11th day er convulsions.	Vaccinifer healthy	No information - -	Vesicle opened -	At 6 weeks old ill with chest symptoms; believed to have heart disease. The renewed illness believed by medical man to be influenza, which had been prevalent in family and neighbourhood.
in the Certificate of Death.				
PING-COUGH.				
well; death m whooping-	Not ascertainable -	Not ascertainable, but 1 child vaccinated same place and day did well.	No reliable information.	*See* observations on Case c. (I. *b.*) Whooping cough prevalent.
normal; 3rd ots unhealthy; s, measles.	Could not be found; same vaccinifer as LXXVII., (I. *b.*)	1, vaccination normal, but measles on 12th day, and recovered; 1 other, sloughing ulceration. (I. *b.*, LXXVII.)	No information -	Several cases of measles in the institution; LXXVI., the places became unhealthy about 3rd week, but did not coalesce. Inquest exonerated vaccination, except as having accelerated the stomatitis.
vent through course and perfectly. g-cough began of 2nd week; or axillary	No record- -	No record - -	Vesicles not opened	Child had a cough when vaccinated. Family on both sides consumptive.
ONDITIONS.				
arcely rose at arrhœa, &c., accinated, and y.	Not ascertainable -	Not ascertainable, but 17 other children vaccinated same place and day; one had inflamed arm on 8th day, and subsequently abscesses elsewhere.	No reliable information.	See observations on Case c., Group I. *b.* Child was in almost dying condition from persistent diarrhœa, whooping-cough (which was prevalent), and scalp eruption when vaccinated; had been taken to station for postponement.
ain and squint- cination nor-	Calf lymph (Renner's).	Not stated - -	None - -	No suggestion of relation of meningitis to vaccination. Child fed artificially; had thrush previously. Phthisis in mother's family.
did well and aled; convul- before death.	Not ascertainable -	Not ascertainable, but vaccinated on same day and at same station as c. and CI., and 11 others more or less abnormal.	No reliable information.	Nothing observed by certifier to connect child's death, even as a suspicion, with vaccination. See observations on Case c. (I. *b.*)

Dr. Ballard's Memorandum.

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Miscellaneous Cases, *i.e.*, such

b. In which Vaccination is not

Number on List of Cases. 1.	Initials. 2.	Age when vaccinated. 3.	No. of Insertions. 4.	Reported by 5.	Date of Death. 6.	Vaccination, Public or Private. 7.	Registered Cause of Death (if certified, in *Italics*). 8.	ho V
CXXVII	W. A. W.	4 months	3	Discovered by Inspector.	Feb. 11, 1890	Private - Calf tube (Renner's).	*Abscesses in axilla; convulsions.*	5
CXXVIII	G. B. B.	?	?	Noted by Inspector	Dec. 31, 1889	Public Vaccinator. Calf lymph; source unknown.	*Acute tubercular pneumonia*, 3 *weeks.*	2
CXL	W. F.	3 months	?	Noted by Inspector	May 4, 1889	Public Vaccinator. Arm to arm.	*Purpura hæmorrhagica.*	d
CLVII	E. B.	3 months	3	Noted by Inspector.	Dec. 22, 1890	Public Vaccinator. Tubes.	*Bronchitis*	
*CXXXI	W. R.	3 months	4	Complaint to vaccination officer on registering death.	Mar. 13, 1891	Public Vaccinator. Arm to arm.	*Pneumonia*	

Dr. Ballard's Memorandum

ued.

ncluded in Groups I. or II.—*continued.*

Certificate of Death—*continued.*

Illness commenced. Progress of Disease. 10.	Vaccinifer. 11.	Co-vaccinees. 12.	Sub-vaccinees. 13.	Remarks. 14.
ny, normal, and by week scabs fallen, ing perfectly healed ace. About same scrofulous deposits ite of vaccination, ch softened and st. Later on another arently similar swel- in axilla, which was ed. Convulsions re death.	Renner's calf -	1, half of a calf tube had been used, resealed and next day used for deceased; normal.	No record -	Mother's family markedly tuberculous.
r says (2 years after t) inflammation in week, with pimples head to foot, and lary swelling; heal- of spots retarded by bing and breaking again. More than ears after vaccina- "acute tubercular monia."	Calf lymph, but Public Vaccinator's register not always trustworthy.	3, normal - -	No record - -	Vaccination accused by parents. Child had chronic eczema, but otherwise well. A baby had pneumonia at same time. Shield used and dairy cream applied with finger. Father lost several brothers and sisters during infancy, "went off quickly, and coughed."
y, child "very dull poorly." 3rd day, uric spots gene- , and bleeding from th; pocks com- ing slightly red, not hæmorrhagic.	Normal -	No record - - -	None, of course -	Child "a little dull" on vaccination day and day before. Careful vaccinator. Measles about home at time of vaccination. Probably a case of hæmorrhagic or petechial measles.
l, until about 2nd , when axillary ess formed, and opened and healed. inflammation oc- ed around it and ed. Recovered. plete healing of inated spots de- d for some weeks. ear after vaccina- bronchitis.	Normal - -	4 normal (vaccinated from tubes, 2 on same day as CLVII, and 2 a fortnight later).	Not opened -	Mother regarded death as possibly due to vaccination. Public vaccinator drew Inspector's attention to the case as one of axillary abscess after vaccination.
lay normal, and complaint made. bor states (10 ths after vaccina-) that arm was med at end of 1st, ning of 2nd week, healing was de- d; that there was d blotchy rash on and 10th days, and subsequently to ing a discharge ear and nose, and l became weak. or 4 months after ination there ars to have been eczema. Just e death, broncho- monia.	Normal - -	3 normal - - -	Vesicles opened for use.	Child's condition 3 or 4 months after vaccination was regarded at a "Dispensary" as due to dentition. Another medical man told Inspector that it suggested "syphilis transmitted by vaccination" to his mind, but he saw no clear evidence of syphilis, and did not use antisyphilitic treatment.

Dr. Ballard's Memorandum.

GROUP I.

Miscellaneous Cases, i.e., such as on

b. In which Vaccination is not men on

Number on List of Cases. 1.	Initials. 2.	Age when vaccinated. 3.	No. of Insertions. 4.	Reported by 5.	Date of Death. 6.	Vaccination, Public or Private. 7.	Registered Cause of Death (if certified, in *Italics*). 8.	Des how lon Vaccin 9.
*CLXXXIII	A. D.	6 months	4	Coroner	Aug. 16, 1891	Public vaccinator Arm to arm.	*Syncope from formation of a clot in the heart when suffering from inanition and diarrhœa; natural causes.* (Inquest.)	19 da
*CLXXXVII	A. E. B.	19 years	4	Letter in "Echo"	June 24, 1891	Public vaccinator. Preserved lymph.	*Cerebral tumour; epileptic convulsions.*	9 mo hs

Dr. Ballard's Memorandum

ued.

included in Groups I. or II.—*continued.*

Certificate of Death—*continued*

n Illness commenced, Progress of Disease.	Vaccinifer.	Co-vaccinees.	Sub-vaccinees.	Remarks.
10.	11.	12.	13.	14.
er says spots running and somewhat red days after vaccination, probably injured; th day, vomiting and rrhœa and 2 vesicles nd injured, otherse normal. Post-tem examination owed ordinary conions in death from mer diarrhœa.	Normal: 1 or 2 pustules of impetigo on occiput and mouth after vaccination.	4 normal - -	Vesicles not meddled with.	Vaccination had been twice postponed on account of some cutaneous crack behind ear. Another child had diarrhœa at same time: $\frac{2}{3}$ other children dead before vaccination, one from "inflammation of lungs," the other from "abscess of brain." House a stable-loft dwelling pervaded by ammoniacal effluvia (such as is described in 1st Trade Nuisance Report (p. 127)), and likely to engender diarrhœal disease.
10 days after vaccition sudden headache d vomiting becoming ce frequent, and lowed by other phemena pointing to rebellar tumour."	Normal, but died in December 1890 of "inflammation of heart."	4, of whom 1 normal, 3 not to be found.	None - -	A re-vaccination. Mother asked at hospital if disease could have been caused by a blow "as someone was said to have knocked him about."

Dr. Ballard's Memorandum.

TABLE II.

—	1. Vaccinifer (human) abnormal ocular.	2. Vaccinifer unfit when used.	3. Vaccinator possibly personally infected.	4. Vaccinifer apparently free or free otherwise than as indicated in Columns 1, 2, 3, and 12.	5. Unwholesome surroundings at Vaccinifer's home.	6. Exposure to Erysipelatous or Septic Infection.	7. Erysipelas or its Congeners prevalent in Neighbourhood.	8. Exposure to Infection of Eruptive Fevers, &c.	9. Eruptive Fevers, &c., prevalent in Neighbourhood.	10. Injury to Vesicles during 1st Week, or Bursting.	11. Improper Management or Neglect.	12. Delicacy of Vaccifer or Illness when Vaccinated.	13. Family Unhealthiness or Feverishness.	14. Vesicle opened on Day. For Use. / Not for Use.	15. Co-vaccinees Normal or Abnormal.	16. Sub-vaccinees.	GROUP I. — *Abnormalities* Apparently commencing in	17. Public or Private.	18. Age in Months.	19. Number of Insertions.	20. Kind of Lymph used.	Further Particulars.
																	1ST WEEK.					
xv	n					×							×		n		7th day, inflamed; 8th, erysipelas	Pub.	5		a to a	Unhealthy tuberculous family. Dwelling extremely filthy.
xvii	n					×	×						×	No	n	o	4th day, redness. By 10th, extensive erysipelas	Pub.	6		H.	Sore throats prevalent in family. Child vaccinated just as a series of cases was ending.
xviii	×							×		×	×			No	(×)	o	3rd or 4th day, vesicles broke; 8th, much inflamed. 2nd week, erysipelas extended.	Pub.	3		H. pr.	Exposure to infection of measles on day of vaccination. Vaccinifer normal, but eczema later on. A co-vaccinee had measles on 9th day (i.e., incubating when vaccinated). Other attendants at station irregular course. Sticky applications used.
xl	?			×	×						×	×	×	No		o	By 7th day greatly inflamed, then erysipelas and abscess	Pr.	7	1	H. pr.	Vaccinator unqualified. Uses old points repeatedly. Old shield, often used before, put on the first day.
lxv	?			×											(×)	o	8th day, redness and swelling of fore arm, which extended	Pub.	2	2	H. pr.	Vaccinator probably in fault; previously blamed by inspector. Two other cases by same operator (one xxxi) with similar troubles.
lxix						×											4th day, erysipelas on opposite arm, which extended	Pr.	6		H.	Vaccinations done in crowded room of a private dispensary, offensive and containing patients with suppurating sores.
lxxxii	×	×	×	×										No	×	o	4th day, inflamed; 11th day, diffused	Pub.	4	4	H. pr	Vaccinifer (lxxxv) ill in 1st week, had erysipelas in 2nd week (possibly, however, by infection from vaccinator on 8th day). *See also* lxxxiv and lxxiv.
*c				×								×			×	(×)	2nd day, red; 8th day, much inflamed, erysipelas; abscess, ulceration.	Pub.	5		H.	Vesicles of c picked on 8th day.
ci				×						×					×	(×)	By 8th day extensive erysipelas	Pub.	7		H.	Vaccinator mentally deranged and thoroughly reckless. These are part of a series of 5 fatal and other non-fatal cases. *See* Ser. IV., lxi, lxvi, etc.
xxxi				×										No	o (×)	o		Pr.	4	2	H. pr.	*See* Note to lxv. The same batch of tubes produced various abnormalities in other vaccinees. Two tubes from the vaccinator who supplied them contained pathogenic organisms (viz., S. erysipelas and S. pyogenes).
*xxxv				×			×				×			×	(×)	Yes, but not identified.	6th day, redness; by 8th day much inflamed; subsequently extensive erysipelas, ulceration.	Pr.	3	1	a to a	Vaccinator operates in one place only and very roughly for 6d. Had some 70 cases of scarlatina under treatment. Cream, rags, and poultices applied. No record of co-vaccinees, but abundant failures and inflammations in practice.
lxii	×	×		×	×		×		×					No	o (×)	o	2nd day, commencing areola; 8th day, inflamed; erysipelas extended greatly.	Pub.	3		H. pr.	Vaccinifer excessive areola (habitual to this vaccinator). Boils, abscesses, and fever in neighbourhood prevalent from bad drainage.
lxxxv	n		×											×	×	×	1st week, ill; 2nd week, erysipelas, and then abscess	Pub.	5	4	H. pr.	*See* lxxxiv *supra*, and note. There is some doubt whether the ailment in 1st week was connected with the incubation of erysipelas, or whether disease commenced after inspection on 8th day, when vesicles were opened for use by the infected vaccinator. ‡ sub-vaccinees became erysipelatous.
*xxvii	?	?			×	×					×		×	No	(×)		7th day, inflamed and lymphopaque; erysipelas, ulceration	Pub.	2	4	H.	Presumed vaccinifer under inflammation on 8th day. Another child of family discharging sinuses from hip-joint disease. Possible co-vaccinees inflamed or ulcerated. Child's arm not kept clean.
lxxvii	o	×						×	×					No	× (×)		Pyæmia	Pub.	2	4	H.	Some of vaccinifer's vesicles had burst when tubes taken. Vesicles of lxxvii and lxxix found broken on 8th day. Co-vaccinees pyæmia, abscess, or broken vesicles. Vaccinations done during an epidemic of scarlatina. A series of cases reported in this connexion in which inflammation or erysipelas or other mischief occurred.
lxxix	×	×						×	×					No	× (×)	o	Pyæmia	Pub.	3	2	H.	
*xcv	n			×			?						×	No	o (×)	o	3rd day, ill; 5th day, redness; erysipelas, ulceration, abscess.	Pub.	5	4	a to a	Vaccinator negligent in cleansing instrument. Woman just recovering from enteric fever present. Marked family tendency to consumption. Other vaccinees from other vaccinifers various irregularities (inflammation and burst vesicles).
xxiv	n					×				×			×		n		By 8th day vesicles broken and large areola; erysipelas	Pub.	4	3	H. pr.	Erysipelas probably communicated from mother to child. Family history of susceptibility to erysipelas.
xxxii	n			×	×	×								No	n	o	By 8th day vesicles dark, with excessive areola; erysipelas	Pub.	3	4	a to a	Filthy home. Erysipelas recently in house and neighbourhood. Child used filthy couch and pillow used by a sister when ill with erysipelas.
lxxi									×						n		By 8th day excessive areola; erysipelas, abscess	Pr.	4	3	H. pr.	Measles in neighbourhood and two months previously in house.
cxviii	n ×		×		×				×	×					× (×)	o	1st day, red; 3rd day, pocks broken; 5th, erysipelas	Pub.	5	2	a to a	Vaccinifer inflamed 8th day and lost an eye. Vaccinator attending bad case of erysipelas. Much enteric fever. (Vaccinifer and vaccinee possibly infected on same day.)
cxxx	n												×	No	n	o	1st day, inflamed, and then blisters all round deltoid region	Pub.	5	2	H. pr.	Mother delicate. A first child. Explanation not discovered.
cxvi	×	×				×		×							×	n	2nd day, red; by 8th day extensive, later erysipelas	Pub.	2	3	H. pr.	Vaccinifer had erysipelas at end of three weeks when pocks had healed. Scarlatina and erysipelas prevalent. Mother of one co-vaccinee contracted erysipelas. Pocks pricked on 8th day. This case is interesting, inasmuch as the inflammation in 1st week subsided, scabs and pocks healed and *after* that erysipelas began on shoulder and spread generally. The vaccine *also* had similarly acted localised redness in 1st week, and erysipelas after arm had healed. It looks as if in both instances a second dose of erysipelas infection might have been received.
cvii	×	×		×						×				No	(×)	o	5th day, pocks burst and inflamed; erysipelas	Pub.	3	3	H. pr.	Belong to Hereford series. Vaccinifer almost certainly inflamed arm. Vaccination with instrument used for other purposes. Probable co-vaccinees also attacked mostly in 1st week.
cviii	×	×		×						×				No	(×)	o	3rd or 4th day, pocks burst and inflamed; erysipelas	Pub.	2	3	H. pr.	
*cxvii	n			×	×					×				×	× (×)	×	7th day, inflamed; erysipelas, ulceration	Pub.	3	4	H.	Overcrowding in filthy, comfortless room. Scarlatina in two dwellings close by. Vaccinator not habitually avoiding use of inflamed arms. ‡ sub-vaccinees inflamed arms.
cxli	?						×							No	×	o	3rd day, erysipelas commenced	Pub.	20 days		H.	These two co-vaccinees occupied a workhouse ward furnished with bedding that had lain for a week in a ward previously occupied by a case of erysipelas. Other co-vaccinees vaccinated elsewhere direct from arm of same vaccinifer were unaffected. Measles in the workhouse.
cxlii	?						×		×					No	×	o	6th day, erysipelas	Pub.	16 days		H.	
ci							×			×	×		×		n		6th day, broken pock; 8th day, inflamed; erysipelas	Pr.	3		Calf pr.	Mother suffering at time and previously from inflammatory sore throat. Diphtheria in district. (Lymph taken 8th day was for microscopical investigation.)
civ	n ×		×		×								×		n		8th day, erysipelas, commencing *near eye*	Pub.	2	4	a to a	Vaccinifer attacked with erysipelas same day as civ (probably both infected same day). A previous child, unvaccinated, died of erysipelas.
cxxxix	?				×					×			×		n	o	8th day, broken pocks and inflamed; erysipelas, axillary abscess.	Pr.	3	2	H. pr.	Home very dirty and offensive. Father, "syphilitic liver"; sister, scrofula.
cliii	n				×					×	×			No	o	o	8th day, pocks broken, coalesced, and skin inflamed; cellulitis.	Pub.	1	4	H. pr.	Home an exceedingly dirty hovel. Broken vesicles attributed to rough nursing. Other children vaccinated from other sources normal.
*clv	?					×				×	×		×		(×)	o	Pock broke in 1st week; 7th day, inflamed; erysipelas, ulceration.	Pr.		1	H. pr.	Vaccinator operates in one spot only. Shield from 7th day. Father gouty; mother delicate. Prevalence of erysipelas. Possible co-vaccinee vaccinally abnormal.
cviii		×													×		6th day, inflamed; 9th day, broken vesicles; erysipelas, ulceration.	Pr.	3	4	Calf, trade	Vaccinator (for a fortnight previously attending case of erysipelas) just come from another bad case. ‡ co-vaccinee inflamed, &c.
*clxxi	n													No	×	o	5th day, inflamed; erysipelas, ulceration	Pub.	4	4	a to a	‡ co-vaccinees, erysipelas. §, rose rash. Cases of abnormalities not discovered.
clxxv	n					×							×	No	n	o	By 7th day erysipelas	Pub.	4	4	a to a	Father sore throat from two days before child's vaccination. Abscess in throat burst day before child appeared ill.
*clxxvii	n			×				×							×	n	6th day, red; 8th, increased, with swelling; then extension of erysipelas, and ulceration.	Pub.	4	4	a to a	House dark, dirty, and ill-ventilated. Child after vaccination frequently taken into house where was a case of measles.
*clxxxix			×		×		×							No	×	o	8th day, commencing erysipelas; 2nd week, burst pocks and sores.	Pub.	3	3	Calf, trade	Unwholesome surroundings at home and in tap-room of inn. Erysipelas prevalent, and vaccinator visited a case on vaccination day and day before. ‡ co-vaccinees had eczema commencing near pocks in 2nd week, and sores on falling of crusts. § normal.
xii	n									×	×	×	×	No	n		8th day, redness round pocks, and blebs near them which crushed.	Pub.	2		a to a	Died from diarrhœa then prevalent. Delicate from birth. Neglect and improper feeding. Father a delicate youth.
cxcvii	?			×			×				×						8th day, much inflamed; 12th, erysipelas extended	Pr.	2	2	H. pr.	Vaccinated by unqualified assistant, but inspected 8th day by principal, who took tubes from arm; he was at that time attending cases (not had not vaccinated her). Poultices, cold cream, and cream used from 8th day.
cxcvii	?			×			×		×					No			8th day, arm inflamed and swollen; erysipelas spread	Pr.	2	1	H. pr.	Vaccinator operates in one place for 6d. Father a journeyman shoemaker liable to personal putrid pollution (*see* also cxcix vaccinated by same vaccinator on same day). Erysipelas prevalent.
41	{ n 13 / × 3 / n × 3 } 28	7	6	13	14	9	7	4	9	14	8	3	13	No. 22. × 8	{ n 13 / × 11 / (×) 16							

Explanation of Symbols used in Table II.

n = normal. n × in column 1 = normal on 8th day, but some abnormality later on, but not necessarily in the progress of the vaccinia.
(×) in column 15 = some abnormalities among "Satisfactory" co-vaccinees, i.e., among persons vaccinated by the same operator at or about the same time but from a *different* source.
× = the existence of the several conditions or events specified at the head of the several columns.
H. in column 20 = Lymph from a human source. H. pr. = the same, but preserved in some way.

In this and succeeding Tables * against any case indicates that it was an ulcerative one.

Further Particulars.

ator attacked by erysipelas three or four days after child, and died of it four days before child. Inflamed arms
alent among vaccinees about same time.
ifer's vesicles broken when used. Vesicles injured on 7th day and discharging. Shield used 10th and 11th days.

ded maroon coloured frock worn.

es and cream applied. Some febrile ailment in family and at the school the eldest child attended.

of erysipelas not discovered. Probably unconnected with vaccination.

ifer had impetigo, arm slow healing. Child, thrush when vaccinated. Cream and poultices applied. Mother had
rated legs.
tina prevailed.

r attending to another child with compound fracture. Mumps next door.

ator's (private) proceedings not those of the Board. Operates only in one place.

insufficiently nourished. Dress stuck to pricked vesicles. Mother purulent discharge from ear. Privation.

bly some accidental infection of opened vesicles.

ds of patients in vaccination room. Measles and chicken-pox prevalent. Rags steeped in castor oil applied. ⅓ co-
inees had measles, and ⅓ varicella.
y parents. Previous child died nine weeks after vaccination from "Pemphigus Gangrenosus." The two cases quite
lar. Probably some family constitutional peculiarity.
is when vaccinated. Mother just previously septic uterine discharge. Shield used.

r suppurating sore at child's vaccination. Father a thecal abscess six months later. Defective drainage. Child
ate.
a knacker. Dirty house and family. Offensive effluvia from knacker's yard.

ed "blood poisoning" without sufficient reason. Vaccination not regarded by inspector as concerned in illness or
h.
r dirty and slatternly with discharging sore on ear. Bread poultices and cream applied on return from inspection.

xiii. In this case infection was probably conveyed on day of inspection. Sub-vaccinee very slight inflammation 8th

plained, unless some casual infection gained access by opened vesicles which furnished seven tubes.

plained.

y family. Shield used. ⅓ co-vaccinee inflamed after opening pocks for use. Another case of (non-vaccinel) infantile
us in district.
ifer first remove from trade-lymph, which was possibly partly in fault as possessing some irritating quality. Child
urished.
ifer had burst vesicles by 7th day, and subsequently axillary abscess. Surgery open to septic infection. All co-
inees inflamed, &c, *See also* cliv.
imate. Born with bad eyes. Squalid home. Vaccinifer with tabes mesenterica. Mother unhealthy. ⅓ co-vaccinee
ed and healed slowly.
cing 8th day.

nwholesome, filthy surroundings of home.

peria prevalent. Sore throats in house and neighbourhood. Instrument used of doubtful capability of cleansing
e that although two spots were inoculated on each arm, erysipelas only attacked one side.)
blind. Ailing from birth. Shield used in 2nd week, and became filthy with discharge. Bad nursing. Mother four
lren still-born; two dead.
ifer inflamed after 8th day. Bad drainage. Food kept in scullery with foul clothes. Bread poultices. Some co-
inees and sub-vaccinees undue redness.
teething and artificially fed. Died suddenly in a convulsion. ⅔ co-vaccinees healed slowly from injury.

ator operates in one place only. Surgery open to all sorts of cases. Inspection day bitterly cold. Bread poultices
ied.
s and scarlatina prevalent. $\frac{2}{10}$ co-vaccinees exposed to measles had inflamed arms; rest, not so exposed, normal.

ator a cheap dispensary doctor. Child taken into next house, where vaccinator was attending case of facial erysipelas.

remaining tubes opalescent after a few weeks. Capability of cleansing instrument doubtful. Shield used.

efore attack visited grandmother having chronic ulcer of leg and occasional erysipelas. ⅓ co-vaccinees inflamed. Sub-
inee inflamed and ulcerated.
y of vaccination mother tried to rub lymph off with her saliva. 9th day cream applied with finger. Typhoid in neigh-
rhood. Three recent deaths in family.
es prevalent. ⅓ mother's children dead and one still-born.

y circumcised for phymosis. Erysipelas did not attack this wound. Diarrhœa when vaccinated.

elas and scarlatina prevalent in neighbourhood. Vaccinator just come from case of scarlatina. Lane full of ashpit
ances.
ifer (not inflamed) died 27th day of meningitis. Shield from 4th day. Children (probably playfellows) in next room
l abscesses in neck.
r attacked with sore throat same day as child fell ill. From five days before child's vaccination mother had discharging
ess in ear.
cing from 8th day and Fuller's earth applied with feather and finger. Instrument of vaccinator found filthy. Very
y home.
ed points carelessly kept. Punctured spots injured 2nd day. Exposed to septic inflammation on inspection day.

TABLE II.—*continued.*

Dr. Ballard's Memorandum.

—	1. Vaccifer (human) abnormal source.	2. Vaccifer unfit when used.	3. Vaccinator possibly personally infected.	4. Vaccine apparently more or less efficient in Insti. than as indicated in Columns 5, 7, 8, and 12.	5. Unwholesome surroundings at Vaccinee's Home.	6. Exposure to Erysipelatous or Septic Infection.	7. Erysipelas or its Congeners prevalent in Neighbourhood.	8. Exposure to Infection of Eruptive Fevers, &c.	9. Eruptive Fevers, &c., prevalent in Neighbourhood.	10. Injury to Vesicles during 1st Week, or Diarrhœa.	11. Improper Management or Neglect.	12. Delivery of Vaccine or Illness when Vaccinated.	13. Family Unhealthiness or Functional.	14. Vesicles opened 4th Day. For Use.	14. Vesicles opened 4th Day. Not for Use.	15. Co-vaccinees Normal or Abnormal.	16. Sub-vaccinees.	GROUP I.—*continued.* *Abnormalities* Apparently commencing in	17. Public or Private.	18. Age in Months.	19. Number of Insertions.	20. Kind of Lymph used.	Further Particulars.
																		3RD OR 4TH WEEK.					
*xx	n					×	×		×		×					o	o	Crusting imperfect, erysipelas commenced on shoulder, ulceration of spots.	Pr.	3	3	H. pr.	Sweet oil (used also for children's heads) applied on unchanged lint. Diphtheria prevalent.
xxi	n						×	×		×	×					n		10th day, scabs rubbed off, erysipelas	Pub.			H.	Grandmother, with whom frequently in contact, suffering from erysipelas, which was prevalent in neighbourhood. Vesicles injured during 1st week and sores neglected.
xxvii														×				3rd or 4th week, erysipelas	Pub.		5	Bds, Calf.	Cause of erysipelas not ascertained.
xxxix	n				×					×	×			No		n	o	21st day, scabs rubbed off, then erysipelas and bronchitis	Pub.	9	4	a to a	Mother, a mill hand, habitually left child with dirty neighbour. Poultices and cream applied to wounds left by rubbed-off scabs.
*viii	n				×								×	No		o	o	21st day, sloughing ulcers and erythema	Pub.	4	4	H. pr.	Mother markedly scrofulous.
lxiv	n					×							×	No		n	o	12th day, bronchitis and erysipelas commencing at shoulder.	Pub.	4		a to a	Slept in same bed with father having sore on lip, and mother having recent sore throat.
lxvii	n				×										×	n	o	Pocks healed; erysipelas commenced at elbow	Pub.	3	3	a to a	Erysipelas commenced two days before crusts fell, leaving healed surface. Erysipelas did not occur about scars.
lxxxvii	n						×							No		n	o	Pocks healed; 23rd or 26th day, erysipelas	Pub.	5	4	H. pr.	Persons ill with erysipelas in neighbourhood; one close to child's home.
lxxxviii	n				×					×	×			×		n	n	3rd week, vesicles broken; 3rd week, erysipelas	Pub.	4	4	a to a	Mother a dirty person. Frequently, with dirty fingers, rubbed inferior castor oil on pocks.
xci					×	×					×		×		×			19th day, erysipelas, multiple abscesses	Pr.	3	2	Calf, trade	Mother, several discharging abscesses in breast; dirty, home also. China clay, cream, &c., applied.
xcii	n				×							×				n		13th day, erysipelas	Pub.	4	4	H. pr.	Badly-nourished, unhealthy child. Diet and overcrowding at home.
xcvii	?																	Arm healed slowly; 3rd or 4th week, axillary abscess	?	5		H.	Little information obtainable. Death registered as from "Septicæmia."
xcviii	n					×							×	×			n	By 18th day diffused inflammation of arm and side	Pr.	2		H.	Mother with mammary abscess suckled child (against advice) from bad breast. Opened vesicles said to have been thus infected.
xciii	n										×					n		By 27th day phlegmonous inflammation and multiple abscess.	Pub.	7 days	3	H. pr.	Mother dirty, ill-conditioned, and destitute; stood about in street with child in her arms after 15th day.
*xc	n				×						×	×	×	No		n	o	3rd week, erysipelas, scabs came off, leaving sores	Pub.	4	4	H. pr.	Child had had ophthalmia and convulsions. Other children deformed or rickety. Poultices applied.
xlx	?										×			×		n	n	21st day, erysipelas commenced	Pub.	2	3	H. pr.	Previously-used shield put on.
*xxvi	n									×				×		n		3rd week, scabs knocked off, sore left, erysipelas and abscesses.	Pub.	3	4	a to a	Erysipelas followed production of open sore. Mother, who suckled child during illness, subsequently sore throat, fever, and submaxillary abscess.
cxxxvii	n				×											n		16th day, crust fell, then erysipelas	Pub.	2	4	a to a	Home a back-to-back house with imperfectly disconnected sink pipe.
cvi	?									×	×			No		n	o	23rd day, scabs knocked off, erysipelas	Pr.	6	3	H. pr.	Shield used, knocked off crusts. Arm got well, but child died of broncho-pneumonia.
cxlii	?					×					×	×		No		n	o	10th day, erysipelas began about a nævus; abscess	Pr.	3	2	H. pr.	Strumous first child with two nævi. Rash on nates at birth. Erysipelas in house 10 months before. Scarlatina prevalent.
cxlvi											×	×				n		13th day, vesicles injured; 17th day, cellulitis, abscess	Pub.	3 days	3	Calf, trade	Shield used. Illegitimate. Mother dirty, idle, and careless. Dirty clothing stuck to injured pocks on 15th day.
cxlix	n				×						×			×		n	×	Erysipelas two or three weeks after vaccination	Pub.	2		a to a	Mother dirty and unintelligent. Applied lard and castor oil from a grocer with naked finger, and poultices. A sub-vaccinee in same house did well; ½ slight rash and ½ (strumous) axillary abscess three months after vaccination, but otherwise normal.
*clxiv	n					×				×	×			×		n	o	3rd week, axillary abscess, then erysipelas, sloughing	Pub.	3	3	a to a	Mother dirty and unintelligent. First child. About 7th day coloured woollen shawl stuck to pocks. Various improper things applied.
clxvii	?			×					×	×			×	No		n	o	12th day, spread of erysipelas commenced	Pr.	5	3	H. pr.	Teething, and just recovered from bronchitis. Sleeve of frock caked with discharge. Vaccinator blew lymph from tube on to his thumb-nail. Scarlatina in district.
clxix	n			×				×		×				No		n	o	20th day, scabs pulled off, then erysipelas	Pub.	3	3	a to a	On 19th day an unqualified assistant pulled off normal crusts. On day of inspection children from two families with measles were present.
clxxxii	n ×				×						×			?		n		3rd week, inflammation, which spread, but spots healed	Pub.	4	3	a to a	In 3rd week 1 spots healed, but sore inflamed, and erysipelas spread from it. Mother says pocks opened. Whooping-cough and scarlatina in neighbourhood. Vaccinifer died of bronchitis three or four months after vaccination.
*clxxxiii	n			×	×						×			No		? [×]	o	Late desquamat, crusting; 3rd week, erysipelas, sloughing sores.	Pub.	6	4	a to a	Sweet oil from village shop once applied after scabs had become brown, "did not agree." Home overcrowded. Vaccinator uses habitually assisted arm.
cxxiv	×	×											×	No		n	o	General crop of vesicular eruption, commencing near pock	Pub.	1	4	a to a	Mother ill with phlegmasia dolens, and a sister of hers dying of phthisis (but not at vaccinee's home). Vaccinifer unhealthy.
cx	n							×	×					×		n	o	About 12th day erysipelas commenced and spread	Pub.	2	4	a to a	Erysipelas prevalent. Mother, shortly before child's vaccination, had "sore throat, like diphtheria."
*xcii	n										×			×		n	n	About end of 3rd week sloughing ulcers and cellulitis	Pub.	3	4	a to a	When scabs were falling, various improper things rubbed into arm; general neglect.
*lii	n									×			×			n		3rd week, scabs fell and ulcer formed, scarlatina	Pub.	6		Calf, trade	Scarlatina and diphtheria prevalent. Poultices, household, and cream applied to sore. Family tuberculous. 2 co-vaccinees with discharging vaccination spots, one of them during attack of scarlatina; rest normal.
*lx	n ×	×		×		×				×				No		×	o	13th day, one large bulla, which sloughed	Pub.	3	3	a to a	Mother of vaccinifer had mammary abscess. Vaccinifer illegitimate. Pocks normal on 8th day, but four days later (i.e., in 2nd week) ulceration like lx. Co-vaccinees suffered similarly.
*lxxvi	?							×								×		Spots coalesced into one large sloughing ulcer; 4th week, measles.	Pub.	18	3	H.	Measles in institution. Co-vaccinees had measles, and one, lxxvi. (Group III.), unhealthy spots also.
*cxxi	?											×				n		3rd week, ulceration and axillary abscesses	Pub.	2 days		H.	Puny, probably syphilitic, 2 months' child. Ought not to have been vaccinated.
*cxxix	n	×			×							×	×	No		n	o	By 8th week ulcers, which healed by 11th week	Pub.	1	4	a to a	Vaccinifer's family unhealthy. Child weakened by illness. Family tendency to skin affection, and phthisis. Offensive measinees. Various evidences of scrofula. Whooping-cough six months after vaccination.
*cxcvi	n							×			×	×	×				o	About 3rd week pocks burst and "punched out" sores, then measles.	Pr.	3	2	a to a	Puny, ill-nourished; had been treated for syphilis. Mother had sore eyes, and especially sore throat, for some time. Cream used to burst pocks. 12th and 23th day, a rash regarded as measles. Another child in the same house with measles, but not when child was vaccinated.
*clvi	n	×				?	×					×	×	×		n	n	Opened vesicles formed sores; 9th week, erysipelas	Pub.	2	4	a to a	Vaccinifer very filthy when seen by inspector. Erysipelas began near ear. Erysipelas prevalent. Mother had erysipelas 18 months before, and lesaites might have been concerned in child's attack.
*lii	n					×	×			×	×		×			n		4th week, ulceration	Pub.	4		H.	Mother, purulent discharge from eye. Injury to vesicles in 4th week, when crusts came off after poulticing. Unhealthy family.
59	{ n 25 × 1 n × 3 } 29	4	—	4	14	7	4	4	5	12	18	7	10	No. 13. × 12		{ n 26 × 3 (×) 1 }	—						
																		5TH WEEK OR LATER.					
*xli										×	×			No		n	o	5th week, blebs, sores, and then erysipelas	Pr.	5		Calf, trade	Scabbing vesicles appeared to have been injured by rubbing after 4th week. Cream and violet powder applied to sores.
xlii	n				×									×		n	×	Two weeks after healing, erysipelas	Pub.	3	4	a to a	Defective drainage. In the one sub-vaccinee there was retarded healing from dirty and careless nursing.
lxxxi										×			×	×		n	o	5th week after detachment of scabs, erysipelas, ulceration, abscess in axilla.	Pr.		2	Calf, N.V.E.	Scabs detached during convulsions in 2th week. Mother strumous and subject to abscesses.
cxxiv	n				×									×		n	n	31st day, scabs having fallen, erysipelas	Pr		2	H.	Unwholesome conditions of home above average.
cxv	n								×		×					n		26th day, an unhealed sore, erysipelas	Pub.		4	H. pr.	From 8th day household cream applied with pigeon feather. Scarlatina prevalent.
*clxxxv					×								×	No		n	o	31st day, spots coalesced, then erysipelas and sloughing	Pub.	6	5	Bds, Calf	Puny, very weakly child of epileptic mother, and artificially fed. Home surroundings calculated to promote illness.
		1	—	—	3	—	—	—	1	2	2	1	1	No. 2. × 3		n 6	—						
																		WEEK UNCERTAIN.					
lix	n									×	×	×		No		n	o	Crusts rubbed off sore, inflammation, abscesses in both knee joints.	Pub.	1		a to a	Scrofulous, neglected, illegitimate child put out to nurse; had measles a month prior to vaccination.
clix	?			×	×							×	×			(×)		Inflammation, burst vesicles, vomiting began before vaccination.	Pr.			H.	Vaccinator careless in selecting vaccinifers. Father delicate. Mother also with phthisical family history. Some vaccinator, sleeve, and time scarce.
clxxix	n			×	×							×		No		n (×)	o	After 3rd week, erysipelas	Pub.	6	4	a to a	Delicate bottle-fed child. Dirty home with privy nuisance. Frequent use of lymph from inflamed arms.
*xx	?			×														Crust detached, leaving ulcerated surface	Pr.	1	2	H.	Ulceration probably somewhat into occurrence. Mother had had two miscarriages. Child had a general red rash at birth.
4	0.2	—	—	2	2	—	—	—	—	1	1	2	1	No. 2. =		{ n 2 (×) 2 }	—						

TABLE II.—*continued.*

—	Vaccinifer (human) abnormal course. 1.	Vaccinifer unfit when used. 2.	Vaccinator possibly personally infected. 3.	Vaccinator apparently pursuing imperfect method in some other respect than as stated in Columns 2, 3, 4, and 12. 4.	Unwholesome surroundings at Vaccinator's home. 5.	Exposure to Erysipelatous or Septic Influence. 6.	Erysipelas or its Compeers prevalent in Neighbourhood. 7.	Exposure to Infection of Eruptive Fevers, &c. 8.	Eruptive Fevers, &c., prevalent in Neighbourhood. 9.	Injury to Vesicles during 1st Week, or Bursting. 10.	Improper Management or Neglect. 11.	Delicacy of Vaccinee or Illness when Vaccinated. 12.	Family Unhealthiness or Predisposition. 13.	Vesicles opened 8th Day: For Use. 14.	Vesicles opened 8th Day: Not for Use. 14.	Co-vaccines Normal or Abnormal. 15.	Sub-vaccines. 16.	46 ULCERATIVE CASES OF GROUP I. *Ulceration* Apparently commencing in	Public or Private. 17.	Age in Months. 18.	Number of Insertions. 19.	Kind of Lymph used. 20.	Further Particulars
																		1ST WEEK.					
clv	?						×			×	×		×			(×)	0	Pock broke in 1st week; 8th day, "running sore"	Pr.	3	1	H. pr	Vaccinator operates in one place only. Shield from 7th day. Father gouty. Mother delicate. Prevalence of erysipelas. Possible co-vaccinees inflamed or ulcerated.
clxxii	n														No	×	0	Ulceration by 8th day	Pub.	4	4	n to n	½ co-vaccinees erysipelas. ½, rose rash. Cause of abnormalities not discovered.
2	—	—	—	—	—	—	1	—	—	1	1	—	1	No. 1.		× ½ (×) ½	—						
																		2ND WEEK.					
xxvii	?	?				×	×				×		×	No		(×)		7th day, inflamed and lymph opaque	Pub.	2	4	H.	Presumed vaccinifer undue inflammation on 8th day. Another child of family discharging sinuses from hip-joint disease. Possible co-vaccinees inflamed or ulcerated.
lxxx	n					×	×				×		×	×		n	n	Early 2nd week, erysipelas	Pub.	3	2	n to n	Mother dirty and slatternly with discharging sore on ear. Poultices and cream applied on return from 8th day inspection.
lxxxiv	n			×										×		×	×	9th day, inflamed	Pub.	6	4	H. pr.	Sis lxxiii. In this case infection was probably conveyed on day of inspection. Sub-vaccinee slightly inflamed 8th day.
x	n									×	×		×	No		×	0	9th day, redness; 13th, sloughing; 23rd, tetanus	Pub.	2	4	n to n	Weekly family. Shield used. ½ co-vaccinees inflamed after opening pock for use. Another case (non-vaccinal) tetanus in district.
xciv	n				×			?					×	No		o (×)	0	3rd day, ill; 5th, redness	Pub.	5	4	n to n	Vaccinator neglects cleaning instrument. Woman just recovering from enteric fever present. Marked family bend up to consumption. Other vaccinees from other vaccinifers various irregularities (inflammation, burst vesicles, &c.).
clvi	n	×					?	×						×		n	n	Vesicles opened 8th day, formed running sores	Pub.	2	1	n to n	Vaccinifer very filthy. Erysipelas began near ear. Erysipelas prevalent. Mother had erysipelas 10 months before, and families might have been concerned.
xxv	?									×	×		×			n		2nd week, erysipelas; vesicles injured 11th day; sloughing	Pr.	4		H. pr.	Adherent rag after poulticing brought away tops of vesicles on 13th day. Febrile ailment in family and eldest child's school.
cxxxii	n	×				×						×	×	No		n	0	2nd week, deep sloughing sores	Pub.	4 days	3	n to n	Illegitimate, born with bad eyes. Squalid home. Vaccinifer with tubes mesenterica. Mother unhealthy. 1 co-vaccinee rubbed and healed shortly.
cviii			×													×		By 9th day vesicles broken; by 13th day ulceration	Pr.	3	4	Calf, trade	Vaccinator for fortnight previously attending case of erysipelas; just come from another bad case. ½ co-vaccinees inflamed.
clxvi	n			×	×						×					×		By 10th day sloughing ulcers	Pr.	3	2	n to n	Poulticing from 8th day, and Fuller's earth applied with feather and finger. Instrument of vaccinator found filthy.
clxxviii	n				×				×							n		8th day, inflamed, then ulceration	Pub.	4	4	n to n	House dirty and ill-ventilated. Child after vaccination frequently taken into house where was a case of measles.
clxxxix				×	×			×						No		×	0	8th day, commencing erysipelas; 2nd week, burst pock and sores.	Pub.	3	3	Calf, trade	Unwholesome surroundings at home (an inn) and in taproom. Erysipelas prevalent. Vaccinator visited a case on vaccination day and day before. ½ co-vaccinee had eczema commencing near pocks in 2nd week, and sores on failure of crusts. ½ normal.
cvii	n				×	×			×		×		×	×		n	n	2nd week, erysipelas and sloughing ulcers	Pub.	3	4	n to n	Mother erysipelatous sore throat and special liability to erysipelas. Unclean house with privy nuisance. Cream (possibly tainted) applied on 8th day to opened pocks with finger. Scarlatina prevalent.
xix					×										×	n	0	11th day, deep sloughing ulcer from coalescence	Pub.	4	3	Calf, trade	Certified as "pyæmic." "Phagedenic ulceration" a better name. Unwholesome surroundings of home with poor expectations.
cxlviii				×	×								×	No		n	0	Pocks broke, formed one deep sore	Pub.	6	4	Calf, trade	Mother delicate, with cracked nipples and erysipelas. Other children apparently strumous.
cvi	n				×					×		×		No		n	0	2nd week (after injury) ulceration	Pub.	5	4	H. pr.	Feeble from birth. Recent measles. Home dirty and ill-ventilated in a condemned London East End court. Elder children picked crusts off 7 pocks.
lxxxii														No		n	0	16th day, pocks discharged, spots coalesced	Pr.	4	4	Calf, trade	Secondary vesicles elsewhere (? by auto-inoculation).
cxc	n				×			×		×	×	×				×	n	1st week (?), axillary abscess; 2nd week, inflammation, and subsequently ulcers.	Pub.	3	5	n to n	A previous vaccination failed. Home miserable and filthy. Scarlatina and erysipelas prevalent. Heads of pocks cases of in a poultice. Co-vaccinees of the first vaccination (which failed) normal.
18	—	2	3	2	11	4	3	1	2	4	7	2	8	No. 3. × 8		n. 15. × 3 (×) 2	—						
																		3RD OR 4TH WEEK.					
xxix	n	×			×	×				×	×	×	×			n		9th day, inflammation; 11th, erysipelas, then ulceration and sloughing.	Pub.	3		H.	Vaccinifer had impetigo, and arm slow in healing. Child had thrush when vaccinated. Cream and poultices applied. Elder had ulcerated legs.
	n				×						×		×	No		o	0	21st day (or earlier), sloughing, ulceration, erysipelas	Pub.	4	4	H. pr.	Mother markedly scrofulous.
xxxv	?			×					×		×			×		(×)		1st week, inflammation, &c., erysipelas spread and then ulceration.	Pr.	3	1	n to n	Vaccinator operates roughly in one place only for 6d. Had some 70 cases of scarlatina under treatment. Cream, tar, and poultices applied. No record of co-vaccinees, but abundant failures and inflammations in practice.
lxx	?				×						×			×		n	n	2nd week, multiple abscess, subsequently pocks ulcerated	Pr.	2	4	H. pr.	Father a knacker. Dirty house and family. Offensive effluvia from knacker's yard.
cxvii	n			×	×				×					×		× (×)	×	By 8th day, erysipelas: 14th and 15th, scabs fell, deep sores.	Pub.	2	4	H.	Overcrowding in filthy, comfortless room. Scarlatina in two dwellings close by. Vaccinator not habitually washing use of inflamed arms. ½ sub-vaccinees inflamed arms.
cxxvi	n									×				×		n		3rd week, scab knocked off, deep sore left	Pub.	3	4	n to n	Mother, who suckled child during its illness, had subsequently sore throat, fever, and submaxillary abscess.
cxxxi	?									×	×		×	No		n		2nd week, erysipelas; 19th day, loose scabs covering ulcers.	Pr.	4	2	H. pr.	On day of vaccination mother tried to rub off lymph with her saliva. 9th day, cream applied with finger. Typhoid in neighbourhood. Three recent deaths in family.
cliii	n ×				×	×					×					n		By 20th day scabs fallen, leaving ulcers	Pr.	3	2	n to n	Vaccinifer (arm not inflamed) died 27th day from meningitis. Shield from 4th day. Children next room, abscesses in neck.
clxxiii	n			×	×						×			No		? (×)	0	Late development, crusting; 3rd week, erysipelas and sloughing sores.	Pub.	6	4	n to n	Sweet oil from village shop once applied after scabs had become brown, "did not agree." Home overcrowded. Vaccinee was habitually scrubbed arms.
cciii	n										×			×		n	n	About end of 3rd week sloughing ulcers and cellulitis	Pub.	3	4	n to n	When scabs were falling various improper things rubbed into arm. General neglect.
liii	n									×	×		×			×		3rd week, scabs fell and ulcers formed, scarlatina	Pub.	6		Calf, trade	Scarlatina and diphtheria prevalent. Poultices, cream, and housleek applied to sore. Family tuberculous. ½ co-vaccinee had scarlatina; rest normal.
lx	n ×	×		×		×				×				No		×	0	13th day, one large bulla which sloughed	Pub.	3	3	n to n	Mother of vaccinifer had mammary abscess. Vaccinifer illegitimate, pocks normal on 8th day, but four days later (i.e. in 2nd week) ulceration like lx. Co-vaccinees suffered similarly.
lxxvii	?							×								×		Spots coalesced into one large sloughing ulcer; 5th week, measles.	Pub.	15	3	H.	Measles in institution. Co-vaccinees had measles, and one of them unhealthy spots also. (*See* lxxvi, Group III.)
cxxi	?											×				n		3rd week, ulceration and axillary abscess	Pub.	2 days		H.	Puny, probably syphilitic, 7 months' child. Ought not to have been vaccinated.
cxxix	n	×			×							×	×	No			o	By 4th week ulcers which healed by 11th week	Pub.	1	4	n to n	Vaccinifer's family unhealthy. Family tendency to skin affections and phthisis. Offensive nuisances. Various evidences of scrofula. Whooping-cough six months after vaccination.
cxcvi	n						×			×	×	×	×				o	About 3rd week pocks burst, leaving punched out sores, then measles.	Pr.	3	2	n to n	Puny, ill-nourished, and had been treated for syphilis. Mother had sore eyes, not especially sore throat, for some time. Cream said to burst pocks on 19th and 20th days. Rash regarded as measles. Another child in house had measles.
lii	n				×	×				×	×		×			n		4th week, ulceration	Pub.	4		H.	Mother had purulent discharge from eyes. Injury to pocks in 4th week, when crusts came off after poulticing. Unhealthy family.
o	?			×							×				×	(×)		1st week, inflamed; by 4th week, coalesced into one ulcer	Pub.	5		H.	Vaccinator mentally deranged and thoroughly reckless. One of a series of fatal and non-fatal cases in his practice.
cv	n				×						×	×	×	No		n	0	3rd week, erysipelas; scabs fell, leaving sores	Pr.	4	4	H. pr.	Scabs came off after poulticing. Child had had ophthalmia and convulsions. Other children deformed or rickety.
clxiv	n				×					×	×					n	0	3rd week, axillary abscess, then erysipelas and sloughing	Pub.	3	3	n to n	First child of dirty, unintelligent mother. About 7th day coloured woollen shawl stuck to pocks. Various improper applications.
cclv	n	×			×					×	×			No		n	0	End of 2nd week, crusts injured, ulceration and abscesses	Pub.	2	4	n to n	Child dirty and neglected. Poultices and yellow ointment on appearance of first redness. Very filthy crowded home with most serious nuisances.
cxciii					×					×	×			No		n	0	8th day, white heads between pocks, then coalescence and one large ulcer, pneumonia.	Pub.	11 days	1	Calf, trade	Illegitimate. Mother dirty. On 7th day child removed from workhouse to unwholesome lodgings. Use of old vaccine-rag sometimes removed with violence.
22	n × 2	4	—	5	12	4	—	2	4	8	13	6	8	No. 3. × 7		n. 10. × 4 (×) 4	—						
																		5TH WEEK OR LATER.					
xx	n								×		×					o	0	4th week, erysipelas commenced on shoulder, ulceration	Pr.	3	3	H. pr.	Sweet oil (used also for children's heads) applied on unchanged lint. Diphtheria prevalent.
clxxvi					×							×		No		n	0	By 31st day spots coalesced, then erysipelas and sloughing	Pub.	6	5	Res. calf	Puny very weakly child of epileptic mother and artificially fed. Home surroundings calculated to promote illness.
xli										×	×			No		n	0	7th week, blebs, sores, and then erysipelas	Pr.	5	3	Calf, trade	Scabbing vesicles said to have been injured.
3	—	—	—	—	—	1	—	—	—	1	1	2	1	—	No. 2.	n. 2	—						
																		WEEK UNCERTAIN.					
cx	?					×												Crust detached, leaving ulcerated surface	Pr.	1	2	H.	Ulceration probably of somewhat late occurrence. Mother had had two miscarriages. Child had general red rash at birth.
1	—	—	—	—	—	1	—	—	—	—	—	—	—	—		—	—						

TABLE II.—*continued.*

?—	Vaccinifer (human) Abnormal Course. 1.	Vaccinifer unfit when used. 2.	Vaccinator possibly personally infected. 3.	Vaccinator otherwise in fault. 4.	Unwholesome surroundings of Vaccinee's Home. 5.	Exposure to Erysipelatous or Sepsis Infection. 6.	Erysipelas or its Conveners prevalent in Neighbourhood. 7.	Exposure to Infection of Eruptive Fevers. 8.	Eruptive Fevers, &c. prevalent in Neighbourhood. 9.	Injury to Vesicles or Bursting. 10.	Improper Management or Neglect. 11.	Delicacy of Vaccinee or Illness when Vaccinated. 12.	Family Unhealthiness or Peculiarities. 13.	Vesicles opened 8th Day. For Use. 14.	Vesicles opened 8th Day. Not for Use. 14.	Co-vaccinees Normal or Abnormal. 15.	Sub-vaccinees. 16.	GROUP II.* *Abnormalities.*	Public or Private.	Age in Months.	Number of Insertions.	Kind of Lymph used.	Further Particulars.
xlv	:			×								×	×					Syphilitic eruption. Nothing abnormal noted about pocks.	Pr.	3	1	it	Vaccinator operates in one place only with a knife not in good condition when seen by inspector. Syphilitic eruption *preceded* vaccination. 3 children dead. This child and two others born with cleft palate.
xlvi	n												×			n		Pocks, normal course, leaving no sore or lesion behind. Two months after vaccinat on syphilitic rash.	Pub.	6	3	a to a	Mother miscarried in three first pregnancies.
xlvii	n									?	×	×	×	×		n		About 12th day arm inflamed, subsequently ulcerated without any induration. At Children's Hospital diagnosed as "congenital syphilis."	Pub.	4		H.	Soon after birth snuffles and redness about buttocks, persistent up to time of vaccination. Never strong. Vesicles perhaps rubbed by children who nursed infant. Mother had one miscarriage, one still-born child, one died from "consumptive brain," and 2 living children strumous. Linen bandages and Fuller's earth applied to unhealed arm.
xc	n										×				no	n	o	6th or 8th day elevations (not vaccine pocks) began to appear, and others near them broke and ran into a sloughing sore.	Pub.	3	3	H. pr.	Case recognised as syphilis by staff of Leeds Infirmary. Family history suspicious.
lxxii §	n															n		Three weeks after vaccination, patch of redness (which extended) and ulceration near scabs.	Pub.	3		a to a	Snuffles prior to vaccination. Parents syphilitic. Certifier and inspector regarded case as congenital syphilis.
5	n 4			1							1	2	3	nc 1 › 1		n 4							

* Three cases, included in Group II. in Table I., viz., Cases xlviii, xlix, and cxlvii, because *alleged* to have been syphilitic, are excluded here because they turned out not to have been syphilitic, and have been therefore transferred in Table II. to Group III.

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TABLE II.—continued.

1. Vaccinifer (Summary statement given).	2. Vaccinifer unfit when used.	3. Vaccinifer probably personally affected.	4. Vaccinifer otherwise in fault.	5. Unwholesome Surroundings at Vaccinator's House.	6. Exposure to Erysipelatous or Septic Infection.	7. Erysipelas or its Congeners prevalent in Neighbourhood.	8. Exposure to Infection of Eruptive Fevers, &c.	9. Eruptive Fevers, &c. prevalent in Neighbourhood.	10. Injury to Vesicles or Scarring.	11. Improper Management or Neglect.	12. Delivery of Vaccine or Illness when Inoculated.	13. Family Unhealthiness or Pestilence.	14. Vesicles spread 8th Day. For Use. / Not for Use.	15. Constitutional Normal or Abnormal.	16. Sub-vaccinoses.	GROUP III. *Death-causing Abnormalities* Apparently commencing in	Public or Private.	Age in Months.	Number of Insertions.	Kind of Lymph used.	Character of the Vaccinia.	Death, how long after Vaccination.	Further Particulars.
																1ST WEEK.							
×				×										(×)		Whooping cough	Pub.			H	Arms did well	6½ weeks	Whooping cough prevalent. [*See* Case *c*, Group I.]
×														×		2nd day, bronchitis, subsequently meningitis	Pub.	3		a to a		2 weeks	Of co-vaccinees 1 somewhat inflamed, 1 ill-kept child; scabs coalesced.
×														n		Constipation, wheezing, convulsions	?	3	3	H	Arm rising	5 days	Bowels allowed to remain several days unrelieved. Child hand-fed.
×				×										n		6th day, diarrhœa (summer)	Pub.	5		H	Normal throughout	6 days	Diarrhœa prevalent in the neighbourhood and in the house.
×														n		2nd day, convulsions	Pub.	3		H		6 days	Bottle-fed child, and some diarrhœa. Hot weather.
×								×				×				3rd day, purpura and hæmorrhage from mouth	Pub.	3		a to a	Vesicles rising. Not hæmorrhagic.	3rd day	Probably hæmorrhagic or petechial measles. Measles prevalent in neighbourhood. Not well on vaccination day.
×													×			3rd day, pneumonia (influenzal?)	Pr.	4	3	a to a	Normal	10 days	Worn six weeks old, chest symptoms. Influenza prevalent in family and neighbourhood.
n													No	n	0	7th day, pneumonia	Pub.	3	4	a to a		18 days	Pneumonia due to exposure on vaccination day (one of severe frost).
57				1	1				1				No 1 / × 1	n 4 / × 1 / (×) 1									
																2ND WEEK.							
n								×	×					n	×	9th day, "rash"; 10th day, swelling over shoulder; 11th day, scarlatina and erysipelas together.	Pub.			H	Pocks normal on 8th day; did not heal.	19 days	Scarlatina recently in neighbouring family. On inspection day a member of a family in which was diphtheria was present at station. Sub-vaccinee broken vesicles, and late crust, perhaps from injury.
?								×						n	o	10th day, scarlatina and erysipelas together	Pub.	3		H	8th day, normal; 10th day, scarlatina and erysipelas.	17 days	Child exposed to scarlatina infection a few days before illness.
n														n	n	9th day, eruption of measles	Pub.	1		H	8th day, normal	9 days	Measles in neighbouring houses. Measles probably complicated with broncho-pneumonia.
n													×	n	o	9th day, "convulsions"	Pub.	6	4	a to a	Normal	9 days	Probably accidentally suffocated.
?														n		8 or 9 days after vaccination, convulsions	Pub.	5		H	Progressing normally	8 to 9 days	Several attacks of convulsions before vaccination. Was teething.
													No	n		8th day late, vomiting and diarrhœa	Pr.	4	1	H. pr.	Progressing normally	9 days	Previous child had died from similar illness unassociated with vaccination.
															o	9th day, meningitis	Pr.	3	3	Calf, trade	Normal	11 days	Child had previously had thrush. Fed artificially. Mother's family phthisical.
?													No		o	Whooping cough	Pub.	3	4	H	Normal and healed perfectly	4½ months	Child had a cough when vaccinated. Family on both sides consumptive.
n										×				n		Syncope from exposure	Pub.	3		a to a	8th day, normal	8th day	Child exposed on evening of inspection day to cold and wind (in February).
n													No	n	o	10th day, seldom convulsion	Pub.	5 weeks	4	H. pr.	Normal to the last	9 days	Puny illegitimate child of undersized, anæmic, untidy woman.
n														n	o	About 9th day, headache, vomiting; cerebellar tumour	Pub.	19 years	4	H. pr.	Normal and healed duly	9 months	Re-vaccination. A suggestion that he had been "knocked about."
n														n		10th day, brain disturbance	Pr.	4	2	H. pr.	Unduly inflamed?	10 days	Vaccinator says redness (10th day) of arm moderate. Mother says from elbow to shoulder.
											×	×	No	o	o	Teething convulsions	Pr.	9	2	Calf, trade	Normal	8 days	Twice postponed for bronchitis or eczema. Previous nervous phenomena. Neurotic family tendency.
57							2	1		1	1	1	No 4 / × 1	n 9									
																3RD WEEK.							
n									×				No	n		2nd week, fretful; 3rd week, convulsions	Pub.	3		a to a	8th day, normal	3 weeks	Neglected illegitimate child.
																12th day, blebs "like vaccination vesicles" in crops; convulsions	Pr.	2	2	H. pr.	Normal. 12th day, crusts dry	2½ weeks	Case obscure. Perhaps varicella. For somewhat similar case, *see* Group III., cxii.
																13th day convulsions	Pub.	4	3	Bd's, calf	Normal	19 days	Father subject to "fits" of some kind in early life.
										×			×		n	Bronchopneumonia	Pr.	2		Calf, trade	Normal	4 weeks	Imprudent exposure to cold and damp.
54			×						×	×	×	×	No	n		18th day, vomiting and diarrhœa (summer)	Pub.	6	4	a to a	Vesicles injured in 1st week	19 days	Twice postponed for cutaneous eruption. 2 other children dead before vaccination from "inflammation of lungs" and "abscess of brain."
n										×				n		16th day, accident; 21st day, blebs in various parts, followed by ulcers.	Pub.	1	4	H. pr.	Normal	2½ weeks	Injury apparently to femoral vein, and certified "vaccine syphilis!". No ground whatever for this opinion. Positively on return from inspection.
42 / 12				1					1	3	1	1	No 2 / × 1	n 2									
																4TH WEEK.							
?								×						×		Measles; stomatitis	Pub.	21 years	3	H	3rd week, spots unhealthy, but did not coalesce.	5 weeks	Measles in institution. *See* Group I., lxxvii, for co-vaccinee, who had measles.
n			×						×			×	No	n	o	By 23th day, varicella extending to mouth and tongue	Pub.	1	4	a to a H	22nd day, coalescing of vesicles complete by 23th day.	43 days	Coalescion of vesicles apparently due to intervening vesicles of chicken pox. Coalesced vesicles scabbed and dry. Varicella prevalent. Homo unclean and with nuisances. Compare Group III., 3.
12				1				1	1				No 1	n 1 / × 1									

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TABLE II.—*continued.*

—	1. Vaccinifer (human) abnormal cicatrix.	2. Vaccinifer unfit when used.	3. Vaccinator probably personally infected.	4. Vaccinator otherwise in fault.	5. Unwholesome Surroundings at Vaccinator's Home.	6. Exposure to Erysipelatous or Septic Influence.	7. Erysipelas or its Congeners prevalent in Neighbourhood.	8. Exposure to Infection of Eruptive Fevers, &c.	9. Eruptive Fevers, &c. prevalent in Neighbourhood.	10. Injury to Vesicles or bursting.	11. Improper Management or Neglect.	12. Delicacy of Vaccinee or Illness when Vaccinated.	13. Family Unhealthiness or Peculiarities.	14. Vesicles opened 8th Day. For Use.	14. Vesicles opened 8th Day. Not for Use.	15. Co-vaccinees Normal or Abnormal.	16. Sub-vaccinees.	GROUP III.—*continued.* *Death-causing Abnormalities* Apparently commencing in	17. Public or Private.	18. Age in Months.	19. Number of Insertions.	20. Kind of Lymph used.	21. Character of the Vaccinia.	22. Death, how long after Vaccination.	23. Further Particulars.
																		5TH WEEK OR LATER.							
cxix					×						×					n		2½ months after vaccination, measles	Pub.	3		H	Normal	3 months	Before measles had abscess on scalp and a boil. Hereon to child squalid,
ii	?											×						4 weeks after vaccination, convulsions	Pr.	1		H	Normal	4 weeks	Had had convulsions prior to vaccination, and a previous child had convulsions.
iv	?										×							At various times after vaccination had eczema, diarrhœa, and finally convulsions.	Pub.	3		H	Normal	14 months	Various ailments ascribed to teething. Foul child and delay in vaccination.
xcv	?										×							Probably tuberculous disease	Pr.			H		6 months and more.	An eye removed at one time for tubercular disease. Parents consumptive habits.
xcvi	?												×					2 months after vaccination, vomiting and diarrhœa	Pub.	4		a to a		8 months	Family history markedly consumptive.
cii	?			×														Convulsions day before death	Pub.			H	Normal, and healed	4 weeks	Same vaccinator, day, and station as c, ci, and cxlvi. See Group I.A.
cxxvii													×			n		6th week, scrofulous deposits and abscess	Pr.	4	2	Calf, trade	Normal, and healed	5 months	Mother's family markedly tuberculous.
cxxxvii											×		×			n		2 years after vaccination, tubercular pneumonia	Pub.			Calf, pr.	Inflammation and retarded healing.	2½ years	Chronic eczema after vaccination. Shield used and cross mark finger. A baby had pneumonia at same time as the child. See family history.
clxv	n													×		n		28th day, influenza	Pub.	2 weeks	3	a to a	Normal fairly	5 weeks	Other members of family suffering from influenza.
clxxi	n													×		n		Eczema. Just before death, broncho-pneumonia	Pub.	3	4	a to a	Some inflammation, and healing delayed.	6 months	Dates and statements about pocks, made 20 months after vaccination, much to be trusted. The eczema, &c. after vaccination seen in association with dentition.
clvii	n													No		n	o	Bronchitis	Pub.	3	3	H, pr.	Axillary abscess and erysipelas. Inflammation round it. Recovered.	1 year	
xlix	n															n		After 5 weeks, spathic, diarrhœa, and abscess on buttock	Pub.	3	3	a to a	Normal but purgative; red rash on 8th day.	8 weeks	Certified as "syphilis," of which there was no evidence. Subject to and diarrhœa.
cxlvii																n	o	4 months after vaccination, sore mouth and eczema on face, and which infected mother's breast. Then diarrhœa and thrush.	Pub.	7 weeks	5	Bf's. calf, tube.	Vaccination normal and stabbed properly.	9 months	Certified as "syphilis," without any sufficient reason.
13	n 5			1	1						4	1	3	No 1 × 0		n 4									
																		PRIOR TO VACCINATION.							
xi	n											×	×	No		n	o	Constitutional debility	Pub.	4	3	H	Normal but injured vesicles	18 days	Puny, rickety infant; had strophulus before vaccination. One of rickety. ⅔ of them dead.
xiv	?											×						Bronchitis	Pub.	3		H		14 days	Bronchitis apparently when vaccinated.
l	n											×		No		n	o	Marasmus	Pub.	7	3	H	8th day, normal; 11th, broken vesicle.	8½ weeks	Feeble child, had been previously postponed. Parents did not 15 months, of "wasting" in no way connected with vaccination.
lvi												×						Thrush and eczema	Pr.	2		Calf, trade	Normal	6 weeks	Diseased conditions existed when vaccinated. Weakly, puny hand-fed.
lvii	?											×					o	Thrush and eczema	Pr.	3	2	H, pr.	Normal	?	
lxvi	?			×								×						Diarrhœa, &c.	Pub.			H	Vesicles scarcely rose	12 days	Almost in a dying condition when vaccinated. See Group I.A.
clxiii	n				×						×	×		No		n	o	Undefined	Pub.	4		a to a	Normal	10 days	Not well before vaccination. On 8th or 9th day related case of indiscreet exposure.
clxxxi												×	×	No		n	o	Various strumous phenomena	Pr.	1	2	Calf, trade	Normal	3½ months	Struma. Eczema before vaccination. Mother delicate and sickly looking.
8	n 3			1	1						1	8	2	No 4		n 4									

Addenda.

Dr Ballard's Memorandum.

Signification of Symbols in the Addenda.

* Cases in which ulceration occurred, under which term is included any instances in which solution of continuity of the integument at the vaccinated spot is recorded as having occurred at any time after the vaccination, whatever the depth and whether it was confined to the area of the pock or extended beyond it.

n = Normal, wherever it occurs.

\+ in columns relating to co-vaccinees signifies some sort of abnormality in them. In every other column it signifies that the circumstances at the head of the column are on record.

(+) signifies some sort of abnormality in subsidiary co-vaccinees.

n + in col. 1 signifies that the vaccinifer was normal when used, but that some abnormality of the vaccinia or disease of some sort occurred later on.

† indicates cases in which co-vaccinees suffered some sort of abnormality.

‡ ,, ,, ,, subsidiary co-vaccinees ,, ,, ,,

§ ,, ,, ,, both co-vaccinees and subsidiary co-vaccinees suffered some sort of abnormality.

‖ ,, ,, ,, co-vaccinees and subsidiary vaccinees were normal so far as is known.

The absence of one or other of these latter symbols where they are otherwise used indicates that there were either no co-vaccinees or that none are recorded in the reports under analysis.

By "*subsidiary co-vaccinees*" are meant individuals vaccinated by the same person at or about the same time, but not from the same source.

By "*sub-vaccinees*" are meant individuals vaccinated from the individual case under remark.

Addendum A.

Detailed Tabulations under Group I. with Remarks as to particular Cases.

Number of times in which certain possibly causative occurrences are recorded in Primary Tabulation.

Columns.	Cases distributed into the Weeks of Vaccinees commencing Illness.							*b.* Co-vaccinees.		Sub-sidiary Co-vaccinees.
	1st Week.	2nd Week.	3rd Week.	4th Week.	5th Wk. or later.	Uncertain.	Totals.	*	n.	+	(+)
1. Vaccinifer, abnormal only after use, *e.*	3	2	2	—	—	—	7*a*	2	2	3	2
2. Vaccinifer unfit for use, *f.*	7	5	4	—	—	—	16*a*	6	7	5	6
3. Vaccinator personally infective *f.*	6	3	—	—	—	—	9	3	2	6	1
4. ,, disregardful of precautions, *f.*	13	5	4	—	—	2	24	7	4	5	15
5. Unwholesome surroundings at home	14	28	11	3	3	3	62	25	39	5	7
6. Exposure to erysipelas or septic infections	9	14	6	1	—	—	30	8	17	5	2
7. Erysipelas and congeners prevalent	7	4	3	1	—	—	15	4	8	1	2
8. Exposure to infectious fevers	4	1	4	—	—	—	9	3	4	3	1
9. Infectious fevers prevalent	9	12	4	1	1	—	27	7	14	6	5
10. Injury to or bursting of vesicles	16	17	9	3	2	1	48	15	29	8	10
11. Improper management or neglect	8	21	14	4	2	1	50	23	27	4	5
12. Delicacy or illness of vaccinee	3	13	7	—	1	3	27	9	19	2	3
13. Family unhealthiness or peculiarities	13	18	9	1	1	1	43	17	28	3	4
14. Vesicles opened on eighth day	8	23	11	1	3	—	46	15	28	6	5
Number of cases of fatal illness on Tables in which one or more of these occurrences are recorded	41 *10	61 18	32 13	6 2	6 2	4 1	150 —	46 —	82 —	23*c* —	21*d* —

a. Among $\frac{22}{142}$ human vaccinifers. *f*. For *combined* facts as to cols. 1, 2, 3, 4, *see* pages 157–8.

\+ signifies abnormal course in some way, and the number of the total cases in which abnormality was observed.

b. In the remaining cases there were either no co-vaccinees, or none are mentioned in the reports.

c. Of the 23 instances in which abnormalities were noticed among co-vaccinees—

11 were among the 41 cases whose illnesses commenced in their 1st week.
9 ,, ,, 61 ,, ,, ,, ,, 2nd ,,
3 ,, ,, 32 ,, ,, ,, ,, 3rd ,,
0 ,, ,, 12 ,, ,, ,, ,, after their 3rd week.
0 ,, ,, 4 ,, ,, ,, ,, at an uncertain period.

d. Of the 21 instances in which abnormalities were noticed among subsidiary co-vaccinees—

16 were among the 41 cases whose illnesses commenced in their 1st week.
2 ,, ,, 61 ,, ,, ,, ,, 2nd ,,
1 ,, ,, 32 ,, ,, ,, ,, 3rd ,,
0 ,, ,, 12 ,, ,, ,, ,, after their 3rd week.
2 ,, ,, 4 ,, ,, ,, ,, at an uncertain period.

e. Including, however, three cases in which the subsequent disease of vaccinifer was eczema, meningitis, or bronchitis that could have had no relation to the preceding vaccination or its results.

Of the 18 instances in which it is known that there were *sub-vaccinees*, abnormalities of one kind or another are recorded in respect of eight, and of these—

2 were sub-vaccinees of cases whose illnesses commenced in their 1st week, lxxxv. (on the doubtful assumption that the illness represented incubating erysipelas) cxvii.
4 ,, ,, ,, ,, ,, ,, 2nd ,, xvi., lxxxiv., cxxiii., cxxviii.
1 ,, ,, ,, ,, ,, ,, 3rd ,, cxlix.
1 ,, ,, ,, ,, ,, ,, (about) 5th ,, xli.i.

Dr. Ballard's Memorandum.

GROUP I.

Column 1.—Course of Vaccinifer.

Of the 127 human vaccinifers, this is recorded in 93 thus:—

a Passed through course normally without subsequent ascertained illness - - - 76

b Followed a more or less abnormal course *before 8th day* rendering vaccinifer unfit for use. (*See Col.* 2) viz.:—

Vaccinees attacked in first week, lxxxiii., lxii., lxxviii., lxxix., cvii., cvii.*a*, cxvi. - - 7

Vaccinees attacked second week, xxii. ,cxx. - 2

,, ,, third week, cxciv. - - 1

10

c Normal when used on 8th day, but abnormal course or some disease following later on (*i.e.*, local inflammation or ulceration, meningitis, bronchitis, or eczema).

Vaccinees' illness commenced 1st Week.

xviii.‡ Eczema sometime after inspection -
civ. Erysipelas commenced on 15th day -
cxviii.§ Inflammation commenced on 9th day, and ultimately lost an eye - - } 3

In 2nd Week.

cxxiii.† Inflammation after 8th day, shoulder to elbow - - - - } 2
clii.* Died on 27th day, of "Meningitis" -

In 3rd Week.

lx.*† Arm ulcerated in course of second week - - - - } 2
clxxxii.‖ Died of bronchitis, three or four months after vaccination - - -

7

It is not improbable that the vaccinifers of cxviii.§ and cxxiii.§ may have really been infective, as in the stage of incubation of erysipelas, when lymph was taken on 8th day, but it is quite possible that cxviii. and his vaccinifer were infected on same day.

But is difficult to see what the subsequent illnesses of the vaccinifers of xviii.‡ (eczema), clii. (meningitis), or of clxxxii.‖ (bronchitis) could have had to do with the fatal illnesses of the vaccinees (they are therefore omitted from the following tables relating to subsequent columns).

And as to lx.† it is probable that both the vaccinee and vaccinifer (the vaccinee perhaps mediately through vaccinifer) were infected from the same source (the mammary abscess on vaccinifer's mother), but it might have been otherwise, and as in cxviii. and cxxiii. the specific contagium might have been incubating in the vaccinifer.

Column 2.—Vaccinifer unfit for Use.

Of the 93 human vaccinifers, reports indicate unfitness for use in 16, viz:—

Reason of Unfitness of Vaccinifer.

Vaccinees illness commencing in 1st Week.

Vaccinees.

lxxxiii.† Was ill during 1st week (possibly incubating erysipelas).
lxii.‡ Excess of areola.
lxxviii.§ Vesicles furnishing lymph broken.
lxxix.§ Do. do.
cvii.‡ Arm inflamed with almost certainty.
cvii*a*.‡ Do. do.
cxvi.‖ Redness about pocks during 1st week.

In 2nd Week.

xxii. Vesicles furnishing lymph broken.
xxix.*‖ Suffering from impetigo.
cxx.§ Vesicles furnishing lymph broken (axillary abscess afterwards).
cxxxii.*‖ Suffering from tabes mesenterica.
cciv.*‖ Child puny, although arm normal.

In 3rd Week.

lx.*† Illegitimate and mother with mammary abscess.
cxxix.*‖ Belonging to an unhealthy family.
civi.*‖ Child filthily kept, and mother and home filthy.
cxciv.‖ Excess of areola.

Column 3.—Vaccinator personally Infective.

Among the 150 cases of Group I., there are nine in which it is known that the vaccinator had been recently exposed to the chance of becoming a carrier of erysipelatous contagium either at the time of the vaccination or of the inspection or of both, viz.:—

Ground for suspecting vaccinator's infectiveness.

Vaccinee attacked in 1st Week.

Vaccinees.

lxxxiii.† In recent close attendance on bad septic case, and himself having contracted from it phlegmon, &c. (vaccinifer was lxxxv.) - - - -
lxxxv.† Do. do. -
cxviii.§ Day before visited for first time a very bad case of erysipelas (vaccinifer apparently attacked same day as cxviii.) - - - - } 6
civ.‖ Attending in neighbouring street a case of idiopathic erysipelas (vaccinifer attacked same day as civ., *i.e.*, on 15th day of vaccination) -
cviii.*† Vaccinator just come from bad case of erysipelas, and for a fortnight attending other cases - - - - - -
clxxxix.*† Visited on vaccination day and day before a case of erysipelas which was prevalent -

In 2nd Week.

lxxxiv.*† Same vaccinator as of lxxxiii. and lxxxv., (*supra*). (Vaccinifer the same as of lxxxv., and same place and time) - - - -
cxxxiv. Vaccinator in attendance on a case of erysipelas in next house - - - - } 3
clxxiv.‖ On the morning of vaccination at child's home had been attending a case of erysipelas, and after that day was in attendance on other cases in hospital and elsewhere - - - -

The *less probable in this connexion* are civ., cxxxiv., clxxiv., and clxxxix. since—

civ. And her vaccinifer were living under similar unwholesome conditions conducive to erysipelas, while out of 29 other children who were similarly liable to have been infected by vaccinator same day, none suffered.

cxxxiv. Might have obtained contagium directly from next house into which he was taken (the erysipelas not commencing before 11th day).

clxxiv.‖ On inspection day this child, whose pocks had been injured, was exposed to septic infections in out-patient room of the hospital.

clxxxix.† There was an unusual prevalence of erysipelas, and also opportunities of contracting erysipelas from unwholesome surroundings.

lxxxiii.,† lxxxiv.,† and lxxxv.† *belong to a series of cases* (others not having been fatal) that occurred in the practice of a public vaccinator among children vaccinated at two different stations of his on two consecutive vaccinating days, October 14th and 21st. Several interesting questions arise in connexion with these cases. One disputable point is the character of the ailment of lxxxv.† in the 1st week of vaccination, in connexion with which arises the question whether lxxxv.† and lxxxiv.† did not both receive their infection not on October 14th, but on their inspection day, October 21st, and so whether lxxxiii.† received infection direct from the vaccinator on that same day, or from the lymph furnished by lxxxv.† (who was only ailing at that time).

As respects cxviii.§ it would appear probable that the vaccinee and his vaccinifer were infected on same day, as co-vaccinees and a subsidiary co-vaccinee also suffered.

As respects cviii.† no other suggestion can be made, as calf lymph was used and 3 co-vaccinees suffered similarly but less severely, while the lymph in other hands had no evil consequences.

Column 4.—Faults of Vaccinator other than Circumstances included in Cols. 2, 3, 7, 8, 9, 12, or 13.

The faults noted in this column are distinctly faults of carelessness and in unquestionable violation of instructions of the Board to public vaccinators, mainly of Instructions 1, 3, 7, 8, or 9, as also are those included in column 2, and inferentially in column 3. Vaccination performed under circumstances tabulated in columns 7, 8, 9, 12, or 13 may or may not have been faults of carelessness; in some instances they probably were so, but in others may have been due to quite excusable ignorance of the circumstances relating to the vaccinee, and to lack of information. Private vaccinators, although not officially bound by the instructions of the Board, ought to observe them as having issued from an authority well informed upon the subject.

The following are the cases in which the faults referred to in this column were committed.

Dr. Ballard's Memorandum.

Faults.	Week in which Vaccinee was attacked. 1st.	2nd.	3rd.	Uncertain.	No. of Cases (not regarding Duplicate Faults).
Having reference to vaccinifer:					
Habitual use of areolated arms and general careless selection of vaccinifers	lxii.,‡ cxvii.,*§	cxx.§	clxxiii.*‡	cliv.,‡ clxxix.‡‖	6 } 7
Vaccinifer illigitimate	—	—	lx.*†	—	1 }
Having reference to Operator:					
Operator unqualified	xl., cxcvii.	—	—	—	2
Use of "old" points	xl.	—	—	—	1
Instrument used for other purposes	xxxv.,*‡ cvii.,‡ cvii.*a*‡	clxxxv.‖	—	—	4
Habitual negligence in the cleansing of instrument	xciv.*‡	clxvi.*	—	—	2
Moistening points by breathing on them	lxxxiii.†	—	—	—	1 } 13
Points negligently kept	—	clxxiv.‖	—	—	1
Crusts picked off in 3rd. week by unqualified assistant	—	—	clxix.	—	1
Lymph blown out of tube on to vaccinators thumb nail	—	—	clxvii.‖	—	1
General habitual disregard of precautions including any of the above	lxv.,‡ xxxi.,‡ c.,*‡ ci.‡	xxxiv., cxx.§	—	—	6
Cases, 24	13	5	4	2	

In two of the above cases the vaccinators faultiness (under this heading) was *two-fold*, viz., in xl. and cxx.§, so that the actual number of cases in which such faults were committed was 24.

Observe the frequency with which subsidiary co-vaccinees were attacked, viz., in all the cases where there was habitual carelessness in selecting vaccinifers, and in ⅔ cases in which there is reported habitual disregard of precautions, and in ¾ cases in which the instrument used was used also for other surgical purposes.

There were four of the cases in which actual co-vaccinees suffered, viz., cxvii.§, cxx.§, lx.†, and lxxxiii.† In the case of lx.† there is no reason at all for supposing that the illigitimacy of the vaccinifer had anything directly to do with the illness of the vaccinee or co-vaccinee. Their illnesses are sufficiently explicable without reference to this. And lxxxiii.† was one of the series of cases in which the vaccinator was himself infective.

In xxxi.‡ and lxv.‡ it is probable that foul tube lymph had been used, but not necessarily to the knowledge of the vaccinator.

Summary of Columns 1, 2, 3, *and* 4 (*omitting from Column* 1c. *cases zviii., cliii., and clxxzii*).

i.e., of cases in which there was an obvious or subsequently discovered unfitness of vaccinifer for use on 8th day.
,, ,, ,, infectiveness of the vaccinator.
,, ,, operator committed unquestionable faults of negligence or habitually neglected precautions of safety.

Altogether these columns include 42 out of 150 cases of Group I. The following is a list of these cases and shows the week in which each vaccinee showed first symtoms of illness and under which of the columns it is included. *Note* that column 2 and some of the faults of column 4 relate to the vaccinifer, and column 3 and the rest of column 4 relate to the operator.

Week of commencement of Vaccinees' Illness.

1st Week. Cases.	Columns.			2nd Week. Cases.	Columns.			3rd Week. Cases.	Columns.			4th or 5th Week or later.	Uncertain. Cases.	Columns.		
lxxxiii.†	2	3	4	xxii.	2	—	—	lx.*† 1.	2	—	4		cliv.‡	—	—	4
lxii.‡	2	—	4	xxix.*	2	—	—	cxxix.*‖	2	—	—	None.	clxxix.‡	—	—	4
lxxviii.§	2	—	—	cxx.§	2	—	4	clvi.*‖	2	—	—					
lxxix.§	2	—	—	cxxxii.*‖	2	—	—	cxciv.‖	2	—	—					
cvii.‡	2	—	4	cciv.*‖	2	—	—	clxxiii.*‡	—	—	4					
cvii.*a*‡	2	—	4	lxxxiv.*†	—	3	—	clxix.	—	—	4					
cxvi.‖	2	—	—	cxxxiv.	—	3	—	clxvii.‖	—	—	4					
lxxxv.†	—	3	—	clxxiv.‖	—	3	4									
cxviii.§ 1.	—	3	—	clxxxv.‖	—	—	4									
civ.‖	—	3	—	clxvi.*	—	—	4									
cviii.*†	—	3	—	xxxiv.	—	—	4									
clxxxix.*†	—	3	—	cxxiii.† 1.	—	—	—									
cxvii.*§	—	—	4													
xl.	—	—	4													
cxcvii.	—	—	4													
xxxv.*‡	—	—	4													
xciv.*‡	—	—	4													
lxv.‡	—	—	4													
xxxi.‡	—	—	4													
c.*‡	—	—	4													
ci.‡	—	—	4													
Out of 42 cases—21	—	—	—	12	—	—	—	7	—	—	—	None.	2	—	—	—

Observe that among these 42 cases there were—
Marked † — only, 7 (of which one, lx., was certainly due to some other cause).
,, ‡ — 12
,, § — 5
,, ‖ 11
Unmarked, 7

Dr. Ballard's Memorandum.

And that as respects the 21 vaccinees taken ill in their 1st week the actual co-vaccinees were attacked in 8 cases.
" " 12 " " 2nd " " " " 3 "
" " 7 " " 3rd " " " " 1 case (lx.)
" " 2 " " week uncertain " " " " 0
And that as respects the 21 vaccinees taken ill in their 1st week the subsidiary co-vaccinees were attacked in 13 cases.
" " 11 " " 2nd " " " " 1 "
" " 7 " " 3rd " " " " 1 "
" " 2 " " week uncertain " " " " 2 "

These figures would suggest the question whether in the majority of cases attacked after the 1st week these faults were mainly concerned in the production of the vaccinees fatal illness. And it is to be observed that it is just this class of faults, those of columns 1, 2, and 4, especially, to which anti-vaccinators commonly attribute fatal vaccination accidents.

Columns 1, 2, 3, *and* 4 *together* (*omitting from Column* 1c *cases xviii., ciii., and clxxxii.*).

Associated Morbific circumstances marked + in this and subsequent similar Tables.

1st Week Cases.

Columns.	1 a + c	2	3	4	5	6	7	8	9	10	11	12	13	14	Co-vacc.	Sub. Co-vacc.
lxxxiii. -		+	+	+											+	
lxii. -		+		+	+		+			+					o	(+)
lxxviii. -		+							+	+					+	(+)
lxxix. -		+							+	+					+	(+)
cvii. -		+		+						+						(+)
cvii.*a* -		+		+						+						(+)
cxvi. -		+					+		+					+	n	
lxxxv. -			+											+	+	
cxviii. -	+		+		+				+	+					+	(+)
civ. -	+		+		+								+		n	
cviii.* -			+												+	
clxxxix.* -			+		+		+								+	
cxvii.* -				+	+				+					+	+	(+)
xl. - -				+	+						+	+	+			
cxcvii -				+			+				+					
xxxv.* -				+					+		+			+		(+)
xciv.* -				+				+ ?					+		o	(+)
lxv. -				+												(+)
xxxi. -				+												(+)
c.* - -				+								+		+		(+)
ci. - -				+						+				+		(+)
Cases 21	2	7	6	13	6	—	4	1?	6	7	3	2	3	6	8	13

2nd Week Cases.

xxii. -		+								+	+				o	
xxix.* -		+			+	+				+	+	+	+		n	
cxx. -		+		+		+				+					+	(+)
cxxxii.* -		+			+							+	+		n	
cciv.* -		+			+					+	+				n	
lxxxiv.* -			+											+	+	
cxxxiv. -			+			+										
clxxiv. -			+	+		+				+		+			n	
clxxxv. -				+					+						n	
clxvi.* -				+	+						+			+		
xxxiv. -				+										+		
cxxiii. -	+				+						+			+	+	
Cases 12	1	5	3	5	5	4	—	—	1	5	5		2	4	3	1

3rd Week Cases.

lx*. -	+	+		+		+				+					+	
cxxix.* -		+			+							+	+		n	
clvi.* -		+				+ ?	+							+	n	
cxciv. -		+											+		n†	
clxxiii.* -				+	+						+				?	(+)
clxix. -				+				+		+					n	
clxvii. -				+					+	+		+			n	
Cases 7	1	4	—	4	2	1	1	1	1	3	1	2	2	1	1	1

Uncertain Commencement.

cliv. -				+	+							+	+			(+)
clxxix. -				+	+							+			n	(+)
Cases 2	—	—	—	2	2	—	—	—	—	—	—	2	1	—	—	2

Total Cases in which there were associated Morbific Circumstances among all the 42 Cases together.	*
Cols.	
1 (n. + c only)	4—1
1, 2, 3, 4.	42—15
5. Unwholesome surroundings at home	15—8
6. Exposure to erysipelatous or septic infection	5—2
7. Erysipelas or congeners prevalent	5—2
8. Exposure to infectious fevers	1—0?
9. Infectious fevers prevalent	8—2
10. Injury to or bursting of vesicles	15—3
11. Improper management or neglect	9—5
12. Delicacy or illness of vaccinee	9—4
13. Family unhealthiness or peculiarities	8—4
14. Vesicles opened on 8th day	11—6
Co-vaccinees, normal	13
Co-vaccinees +	12
Sub. Co-vaccinees (+)	17
Total ulcerative cases*	15

† But some insertions failed as did $\frac{3}{4}$ in cxciv.

Column 5.—Unwholesome Surroundings at Home.

Dr. Ballard's Memorandum.

Among the 150 cases of Group I. there were 62 in which this condition of things in one form or another was reported. Distributed into weeks of attack of vaccinees they were as follows:—

	Weeks in which Vaccinees' Illness commenced.					
	1st.	2nd.	3rd.	4th.	5th or later.	Uncertain.
	xv.‖ xvii.‖ xl. lxii.‡ xxvii.*‡ xxxiii.‖ cxviii.§ cxvii.*§ clv.‖ cxxxix.‖ cliii. clxxxviii.*‖ clxxxix.*† cxcviii.	xxix.*‖ xxx.‖ xxxii.‖ lxviii lxx.* lxxx.*‖ cxxxii.*‖ cxiii.‖ cxiv.‖ cxxxvi.‖ cxxiii.† cxxii. cxlv.‖ cli.‖ clii.* clxvi.* clxxviii.‖ clxxx.‖ clxviii.‖ cxc.* cxci.† xix.*‖ cxlviii.*‖ cxciii.*‖ cxcv.‖ cci.*‖ ccii.* cciv.*‖	xlii.* lxxxviii.‖ xci. xcii.‖ cv.*‖ cxxxvii.‖ cxlix.‖ clxiv.*‖ clxxxii.‖ clxxiii *‡ cxxix.*‖	xxxix.‖ lxvii.‖ lii.*‖	xliii.‖ cxxiv.‖ clxxvi.*	cliv.‡ clxxix ‡ cx.*
Out of 62 cases -	14	28	11	3	3	3

* Ulcerative cases, 25.

Observe that among these 62 cases there were—

Marked † only, 3, viz., clxxxix., cxxiii., cxci., of which the following were included in Cols. 1, 2, 3, or 4:—clxxxix., cxxiii.
,, ‡ ,, 5 ,, lxii., xxvii., clxxiii., cliv., and clxxix., of which the following were included in Cols. 1, 2, 3, or 4:—lxii., clxxiii., cliv., and clxxix.
,, § ,, 2 ,, cxviii., cxvii., of which the following were included in Cols. 1, 2, 3, or 4:—cxviii., cxvii.
,, ‖ ,, 38
Not marked, 14.

And that as respects the 14 vaccinees taken ill in their 1st week the actual co-vaccinees suffered in 3 cases, of which the following were included in Cols. 1, 2, 3, or 4:—clxxxix., cxviii., cxvii.
,, ,, 28 ,, ,, 2nd ,, the actual co-vaccinee suffered in 2 cases, of which the following was included in Col. 1:—cxxiii.
,, ,, 11 ,, ,, 3rd ,, the actual co-vaccinee suffered in 0 cases.
,, ,, 3 ,, ,, 4th ,, ,, ,, 0 ,,
,, ,, 3 ,, ,, 5th ,, or later ,, ,, 0 ,,
,, ,, 3 ,, ,, Week uncertain ,, ,, 0 ,,

And that as respects the 14 vaccinees taken ill in their 1st week, the subsidiary co-vacinees suffered in 4 cases, of which the following were included in Cols. 1, 2, 3, or 4:—lxii., cxvii., cxviii.
,, ,, 28 ,, ,, 2nd ,, the subsidiary co-vaccinee suffered in 0 cases.
,, ,, 11 ,, ,, 3rd ,, ,, ,, ,, 1 case—included in Col. 4:—clxxiii.
,, ,, 3 ,, ,, 4th ,, the subsidiary co-vaccinee suffered in 0 cases.
,, ,, 3 ,, ,, 5th ,, or later ,, ,, ,, 0 ,,
,, ,, 3 ,, ,, Week uncertain ,, ,, ,, 2 cases—both included in Col. 4:—clxxix., cliv.

There is a distinct indication here that this is a class of morbific influences which exhibits its operation mainly in the course of the second week of vaccination or later. In corroboration of such an inference it is observable that the associations of morbific conditions 1, 2, 3, and 4 occurred in 6 out of the 14 first week cases, and only 8 times in all the remaining 46 cases where abnormalities are known to have commenced in later weeks. There is further corroboration in observing that among the 14 first week cases there were as many as 5 in which co-vaccinees or subsidiary co-vaccinees or both presented abnormalities, while there were only 3 among all the remaining 46 cases whose co-vaccinees or subsidiary co-vaccinees were similarly affected. Normality among co-vaccinees was a distinguishing characteristic of the cases attacked after the first week as contrasted with the cases attacked during the first week.

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Column 5—continued.

1st Week Cases.

Columns.	½ n + c	2	3	4	5	6	7	8	9	10	11	12	13	14	Co-vacc.	Sub. Co-vacc.
xv. -					+								+		n	
xvii -					+	+							+		n	
xl. -				+	+						+	+	+			
lxii. -		+		+	+		+			+					o	(+)
xxvii.* -					+	+					+		+			(+)
xxxiii. -					+	+	+								n	
cxviii. -	+		+		+				+	+					+	(+)
cxvii.* -				+	+				+					+	+	(+)
civ. -	+		+		+								+		n	
cxxxix. -					+					+			+		n	
cliii. -					+					+	+				o	
clxxxviii.*					+			+						+	n	
clxxxix.* -			+		+		+								+	
cxcviii. -					+		+		+							
Cases 14	2	1	3	3	—	3	4	1	3	4	3	1	6	2	3	4

2nd Week Cases.

xxix.* -		+			+	+				+	+	+	+		n	
xxx. -					+				+						n	
xxxii.					+	+			+						n	
lxviii. -					+	+				+		+	+		o	
lxx.* -					+									+		
lxxx.* -					+	+					+		+	+	n	
cxxxii.* -		+			+							+	+		n	
cx ii. -					+					+	+				n	
cx v. -					+									+	n	
cxxxvi. -					+				+				+		n	
cxxiii. -	+				+						+			+	+	
cxxii. -					+						+					
cxlv. -					+						+	+			n	
cli. -					+		+		+	+					n	
cliii.* -					+	+					+					
clxvi.* -				+	+						+			+		
clxxviii. -					+				+			+			n	
clxxx. -					+										n	
clxviii. -					+		+							+	n	
cxc.* -					+		+		+	+	+			+		
cxci. -					+						+			+	+	
xix.* -					+									+	n	
cxlvlii.* -					+	+							+		n	
cxciii.* -					+					+	+				n	
cxcv. -					+								+		n	
cci.* -					+					+		+			n	
ccci*. -					+	+			+		+		+	+		
cciv*. -		+			+					+	+				n	
Cases 28	1	3	—	1	—	7	3	—	7	8	13	6	8	10	2	—

3rd Week Cases.

xlii.* -					+								+		o	
lxxxviii. -					+					+	+			+	n	
xci. -					+	+					+		+	+		
xcii. -					+							+			n	
cv.* -					+						+	+	+		n	
cxxxvii. -					+										n	
cxlix. -					+						+			+	n	
clxiv.* -					+					+	+			+	n	
clxxxii.					+				+						n	
clxxiii.* -				+	+						+				?	(+)
cxxix.* -		+			+							+	+		n	
Cases 11	—	1	—	1	—	1	—	—	1	2	6	3	4	4	o	1

4th Week Cases.

xxxix. -					+					+	+				n	
lxvii.					+									+	n	
lii.*					+	+				+	+		+		n	
Cases 3	—	—	—	—	—	1	—	—	—	2	2	—	1	1	o	—

Total Cases in which there were associated Morbific Circumstances among all the 62 Cases together.

Cols.

1. ½n. + c. only	3—0*
1, 2, 3, and 4	13—8
5. Unwholesome surroundings at home	62—25
6. Exposure to erysipelatous or septic infection	12—7
7. Erysipelas or its congeners prevalent	7—2
8. Exposure to infectious fevers	1—1
9. Infectious fevers prevalent	11—3
10. Injury to or bursting of vesicles	16—7
11. Improper management or neglect	24—13
12. Delicacy or illness of vaccinee	13—6
13. Family unhealthiness or peculiarities	20—10
14. Vesicles opened on 8th day	19—9

Co-vaccinees, normal	39
Co-vaccinees +	5
Sub. co-vaccinees (+)	7
Total ulcerative cases*	25

Column 5—continued.

5th Week or later Cases.

Columns.	1 n + c	2	3	4	5	6	7	8	9	10	11	12	13	14	Co-vacc.	Sub. Co-vacc.
xliii. -					+									+	n	
cxxiv. -					+									+	n	
clxxvi.* -					+							+			o	
Cases 3	—	—	—	—	—	—	—	—	—	—	—	1	—	2	o	—
Week Uncertain.																
cliv. -				+	+							+	+			(+)
clxxix. -				+	+							+			n	(+)
cx.* -					+											
Cases 3	—	—	—	2	—	—	—	—	—	—	—	2	1	—	o	2

Column 6.—Exposure to Erysipelatous or Septic Infections.

Among the 150 cases of Group I. there were 30 in which prior to the commencement of the illness there had been exposure in one way or another (as reported) to the infection of erysipelas or to the opportunity for direct introduction of septic material into the vaccination wounds, or exposure to an atmosphere more or less charged with emanations from sores, &c. Distributing into weeks of attack the vaccinees were as follows:—

Weeks in which Vaccinees' Illness commenced.

	1st.	2nd.	3rd.	4th.
	lxix. xxvii.*‡ xxiv.‖ xxxiii.‖ cxli.† cxlii.† cl.‖ clxxv.‖ xvii.‖	xxix.*‖ xxxii.‖ xxxviii.‖ lxiii.‖ lxviii. lxxx.*‖ cxx.§ cxxxiv. cxxviii.† clii.* clix ‖ lxxiv.‖ exlviii.*‖ ccii.*‖	xxi.‖ lxiv.‖ xci. xcviii. cxliii. lx.*†	lii.*‖
Out of 30 cases	9	14	6	1

* Ulcerative cases, 8.

Observe that among these 30 cases there were—
Marked † only, 4, viz., cxli., cxlii., cxxviii., lx., of which the following was included in Cols. 1, 2,
,, ‡ ,, 1, ,, xxvii.
,, § ,, 1, ,, cxx., which was included in Cols. 2 and 4:—cxx.
,, ‖ 17.
Not marked, 7.

And that as respects the—
9 vaccinees taken ill in the 1st week the actual co-vaccinees suffered in 2 cases.
14 ,, ,, 2nd ,, ,, 2 cases—of which cxx. was included in Cols. 2 and 4.
6 ,, ,, 3rd ,, ,, 1 case—included in Cols. 1, 2, 4.
1 ,, ,, 4th ,, ,, 0 ,,
9 vaccinees taken ill in the 1st week the subsidiary co-vaccinees suffered in 1 case.
14 ,, ,, 2nd ,, ,, 1 case—cxx. included in Cols. 2 and 4.
6 ,, ,, 3rd ,, ,, 0 ,,
1 ,, ,, 4th ,, ,, 0 ,,

It is to be kept in mind that these infections may be received at any time from the day of vaccination onwards, or at the time of inspection on eighth day, when there may be present some co-vaccinee or subsidiary co-vaccinee or other person with erysipelas or septic malady, and hence there is no period at which disease of this group may not originate from this cause. Still, as a matter of fact, the largest number in this association commenced in the second and third weeks, most of them in the second week, during which or subsequently other influences assisting / favouring } absorption of septic virus are most likely to come into operation.

But we should not expect to find co-vaccinees or subsidiary co-vaccinees affected by a cause such as this (operating only on an individual) in any number of instances. Nor were there many, and such as there were seem mostly capable of explanation without reference to this cause of abnormality, thus:—

Of the three cases in first week series, cxli.† and cxliii.,† were two children alone exposed to an infection and alone affected. The inspector's report fails to elucidate the cause of the abnormality in the subsidiary co-vaccinee of xxvii.‡

Of the two cases in the second week series, the co-vaccinees and subsidiary co-vaccinees of cxx.§ had a careless operator, this case, cxx., being found among those in columns 2 and 4. It is to be observed that cxxviii.† and its co-vaccinees were all vaccinated with the compounded material known as "Hime's conserve."

In the third week series, lx.† and his co-vaccinee and vaccinifer probably all suffered from their abnormalities (bullæ followed by sloughing) from the same source, viz., the mammary abscess on vaccinifer's mother; they were not cases of erysipelas, but of local bullæ and sloughing.

Dr. Ballard's Memorandum.

Column 6—continued.

1st Week Cases.

Columns.	1 n + c	2	3	4	5	6	7	8	9	10	11	12	13	14	Co-vacc.	Sub. Co-vacc.
lxix. -						+										
xxvii.* -					+	+					+		+			(+)
xxiv. -						+				+			+		n	
xxxiii. -					+	+	+								n	
cxli. -						+		+							+	
cxlii. -						+		+							+	
cl. -						+			+	+			+	+	n	
clxxv. -						+				+			+		n	
xvii. -					+	+							+		n	
Cases 9	—	—	—	—	3	—	1	2	1	3	1	—	5	1	2	1

2nd Week Cases.

xxix.* -		+			+	+				+	+	+	+		n	
xxxii. -					+	+			+						n	
xxxviii. -						+				+		+	+	+	n	
lxiii. -						+				+	+	+	+	+	n	
lxviii. -					+	+				+		+	+		o	
lxxx.* -					+	+					+		+	+	n	
cxx. -		+		+		+				+					+	(+)
cxxxiv. -			+			+										
cxxviii. -						+								+	+	
clii.* -					+	+					+					
clix. -						+							+	+	n	
clxxiv. -			+	+		+				+		+			n	
cxlviii.* -					+	+							+		n	
ccii.* -					+	+			+		+		+	+	n	
Cases 14	—	2		2	7	—	—	—	2	6	5	5	8	6	2	1

3rd Week Cases.

xxi. -						+	+			+	+				n	
lxiv.						+							+		n	
xci. -					+	+					+		+	+		
xcviii. -						+							+	+		
cxliii. -						+			+		+	+				
lx.* -	+	+		+		+				+					+	
Cases 6	1	1	—	1	1	—	1	—	1	2	3	1	3	2	1	—

4th Week Cases.

ii.* -					+	+				+	+		+		n	
Cases 1	—	—	—	—	1	—	—	—	—	1	1	—	1	—	o	—

Total Cases in which there were associated Morbific Circumstances among all the 30 Cases together.

Cols.	*
1. n. + c only -	1—1
1, 2, 3, and 4 - -	5—2
5. Unwholesome local surroundings -	12—7
6. Exposure to erysipelatous or septic infections -	30—8
7. Erysipelas or its congeners prevalent - -	2—0
8. Exposure to infectious fevers -	2—0
9. Infectious fevers prevalent -	4—1
10. Injury to or bursting of vesicles -	12—3
11. Improper management or neglect -	10—6
12. Delicacy or illness of vaccinee -	6—1
13. Family unhealthiness or peculiarities -	17—6
14. Vesicles opened on 8th day - -	9—2

Co-vaccinees, normal - 17
Co-vaccinees + - - 8
Sub. co-vaccinees (+) - 2

Total ulcerative cases *

Column 7.—Prevalence of Erysipelas or its Congeners.

Among the 150 cases of Group I. there were 15 in which the prevalence of erysipelas, puerperal septicæmia, or boils and abscesses from bad drainage, were reported by the inspectors. Distributed in weeks of attack of the vaccinees they were as follows :—

	Weeks in which Vaccinees' Illness commenced.			
	1st Week.	2nd Week.	3rd Week.	4th Week.
	lxii.‡ xxxiii.‖ cxvi. ‖ clv.*‡ clxxxix.*† cxcvii. cxcviii.	cli.‖ clxviii.‖ cxc.* cxcix.	xxi.‖ clvi.*‖ cc.‖	lxxxvii.‖
Out of 15 cases	7	4	3	1

* Ulcerative cases, 4.

Observe that among these 15 cases there were—
Marked † only 1, viz., clxxxix., which was included in Col. 3.
„ ‡ „ 2 „ lxii. and clv., of which lxii. was included in Col. 4.
„ ‖ „ 8.
Unmarked, 4.

Dr. Ballard's Memorandum.

It is also to be noted that it was only co-vaccinees and subsidiary co-vaccinees of cases attacked in their 1st week that suffered from abnormalities, and one of those was a case, clxxxix.†, in which the vaccinator was probably a carrier of the infection, and another, lxii.‡, in which the vaccinator habitually used areolated arms. clv.‡ was, with his co-vaccinee, vaccinated by a private practitioner who operates only in one place (such men are not usually very particular to observe precautions).

Putting aside these three cases, in which it is not unlikely that more than mere prevalence of erysipelas was concerned in the abnormality, it would appear that (as might have been expected) this cause is one likely to be operative at any period of the vaccinia.

Column 7.—continued.

1st Week Cases.

Columns.	1 n + c*	2	3	4	5	6	7	8	9	10	11	12	13	14	Co-vacc.	Sub. Co-vacc.
lxii. -		+		+	+		+			+						(+)
xxxiii. -					+	+	+								n	
cxvi. -		+					+		+					+	n	
clv.* -							+			+	+		+			(+)
clxxxix.*-			+		+		+								+	
cxcvii. -				+			+				+					
cxcviii. -					+		+		+							
Cases 7	—	2	1	2	4	1	—	—	2	2	2	—	1	1	1	2
2nd Week Cases.																
cli. -					+		+		+	+					n	
clxviii. -					+		+							+	n	
cxc.* -					+		+		+	+	+			+		
cxcix. -							+				+					
Cases 4	—	—	—	—	3	—	—	—	2	2	2	—	—	2	—	—
3rd Week Cases.																
xxi. -						+	+			+	+				n	
clvi.* -		+					+							+	n	
cc. -							+	+						+	n	
Cases 3	—	1	—	—	—	1	—	1	—	1	1	—	—	2	—	—
4th Week Cases.																
lxxxviii. -							+								n	
Cases 1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Total Cases in which there were associated Morbific Circumstances among all the 15 Cases together.	
Cols.	*
1. n. + c. only -	0—0
1, 2, 3, 4 -	5—2
5. Unwholesome local surroundings	7—2
6. Exposure to erysipelatous or septic infections -	2—0
7. Prevalence of erysipelas and its congeners -	5—4
8. Exposure to infectious fevers, &c. -	1—0
9. Infectious fevers prevalent -	4—1
10. Injury to or bursting of vesicle -	5—2
11. Improper management or neglect -	5—2
12. Delicacy or illness of vaccinee -	0—0
13. Family unhealthiness or peculiarities -	1—1
14. Vesicles opened on 8th day -	5—2
Co-vaccinees, normal -	8
Co-vaccinees + -	1
Sub. co-vaccinees (+) -	2
Total ulcerative cases* -	4

Column 8.—Exposure to Infectious Fevers.

Among the 150 cases of Group I. there are 9 in which exposure to the infection of measles, scarlatina, or diphtheria (suspected) is recorded. Distributed in weeks of the vaccinees commencing illness they were as follows:—

	Weeks in which Vaccinees' Illness commenced.			
	1st Week.	2nd Week.	3rd Week.	4th Week.
	xviii.‡ clxxxviii.* cxli.† cxlii.†	clxxvii.	clxix. cc. lxxvii.*† cxcvi.*	
Out of 9 cases	4	1	4	—

* Ulcerative cases, 3.

clxxvii. was exposed to scarlatinal infection, cc. to what was suspected to be diphtheria infection. All the others to measles infection.

cxli.†, cxlii.†, and lxxvii.† were workhouse cases.

None of those marked † or ‡ were included in Cols. 1, 2, 3, or 4.

Dr. Ballard's Memorandum.

Column 8—continued.

1st Week Cases.

Columns.	1 n + c	2	3	4	5	6	7	8	9	10	11	12	13	14	Co-vacc.	Sub. Co-vacc.
xviii. -								+		+	+				n	(+)
clxxxviii.*					+			+						+	+	
cxli. -						+		+							+	
cxlii. -						+		+							+	
Cases 4	—	—	—	—	1	2	—	—	—	1	1	—	—	1	2	1

2nd Week Cases.

clxxvii. -								+						+	n	
Cases 1	—	—	—	—	—	—	—	—	—	—	—	—	—	1	o	—

3rd Week Cases.

clxix. -				+				+		+					n	
cc. -							+	+						+	n	
lxxvii.* -								+							+	
cxcvi.* -								+		+	+	+	+			
Cases 4	—	—	—	1	—	—	1	—	—	2	1	1	1	1	1	—

Total Cases in which there were associated Morbific Circumstances among all the 9 Cases together.

Cols.	*
1. n. + c only -	0—0
1, 2, 3, 4 - -	1—0
5. Unwholesome surroundings -	1—1
6. Exposure to erysipelatous or septic infection - -	2—0
7. Erysipelas or its congeners prevalent - -	1—0
8. Exposure to infectious fevers -	9—3
9. Infectious fevers prevalent - -	0—0
10. Injury to or bursting of vesicle -	3—1
11. Improper management or neglect -	2—1
12. Delicacy or illness of vaccinee - -	1—1
13. Family unhealthiness or peculiarities -	1—1
14. Vesicles opened 8th day - -	3—1

Co-vaccinees, normal -	4
Co-vaccinees + -	3
Sub. co-vaccinee (+) -	1
Total ulcerative cases* -	3

clxix. went on well until crusts were, in third week, picked off by an unqualified assistant.

Column 9.—Prevalence of Infectious Fevers.

Among the 150 cases of Group I. there were 27 in which the prevalence at the time of such diseases as scarlatina, measles, diphtheria, enteric fever, &c. was noted. Distributed in weeks of vaccinees commencing illness they were as follows:—

Weeks in which Vaccinees' Illness commenced.

	1st Week.	2nd Week.	3rd Week.	4th Week.	5th Week, or later.
	xxxv.*‡ lxxviii.§ lxxix.§ lxxi.‖ cxviii.§ cxvi.‖ cxvii.*§ cl.‖ cxcviii.	xxx.‖ xxxii.‖ liv. cxxxvi.‖ cxxv.† cxxxi.*‖ cxliv. cli.‖ clxxviii.‖ clxxxv.‖ cxc.* ccii.*‖	cxliii. clxvii.‖ clxxxii.‖ liii.*†	xx*	cxv.‖
Out of 27 cases	9	12	4	1	1

* Ulcerative cases, 7.

Observe that among these 27 cases there were—

Marked † only 2, viz., cxxv., liii.
,, ‡ ,, 1, ,, xxxv., which was included in Col. 4.
,, § ,, 4, ,, lxxviii., lxxix., cxviii., cxvii., of which the following were included in Cols. 1, 2, 3, or 4:—
lxxviii., lxxix., cxviii., cxvii.
,, ‖ 14.
Unmarked, 6.

Dr. Ballard's Memorandum.

So that there were only cxxv.† and liii.† in which the abnormalities of co-vaccinees were not accounted for readily and otherwise than by the operation of this cause.

And that as respects the 9 vaccinees taken ill in their 1st week the actual co-vaccinees suffered in 4 cases:—lxxviii., lxxix., cxviii., cxvii., all of which were included in Cols. 1, 2, 3, or 4.

And that as respects the 12 vaccinees taken ill in their 2nd week the actual co-vaccinees suffered in 1 case.

" " 4 " " 3rd " " " $\frac{1}{4}$ "

" " 2 " " 4th or 5th " " " 0 "

" " 9 " " 1st week the subsidiary co-vaccinees suffered in 5 cases:—xxxv., lxxviii., lxxix., cxviii., cxvii., all of which were included in Cols. 1, 2, 3, or 4.

And that as respects the 18 co-vaccinees taken ill in their 2nd, 3rd, 4th, or 5th week the subsidiary co-vaccinees suffered in 9 case.

Putting aside then the four first week cases, lxxviii.,§ lxxix.,§ cxviii.,§ cxvii.,§ whose abnormalities may be regarded (cxvii. only probably) as mainly due to influences of Cols. 2, 3, or 4, it would appear that the cause under consideration exhibits its influence chiefly in the course of the second week, when the constitutional disturbance produced by the vaccinia is at its height.

Column 9—continued.

1st Week Cases.

Columns.	1 n + c	2	3	4	5	6	7	8	9	10	11	12	13	14	Co-Vacc.	Sub. Co-Vacc.
xxxv.* -				+					+		+			+		(+)
lxxviii. -		+							+	+					+	(+)
lxxix. -		+							+	+					+	(+)
lxxi. -									+						n	
cxviii. -	+		+		+				+	+					+	(+)
cxvi. -		+					+		+					+	n	
cxvii.* -				+	+				+					+	+	(+)
cl. -						+			+	+			+	+	n	
cxcviii. -					+		+		+							
Cases 9	1	3	1	2	3	1	2	—	—	4	1	—	1	4	4	5

2nd Week Cases.

xxx. -					+				+						n	
xxxii. -					+	+			+						n	
liv. -									+							
cxxxvi. -					+				+				+		n	
cxxv. -									+						+	
cxxxi.* -									+		+		+		n	
cxliv. -									+				+	+	o	
cli. -					+		+		+	+					n	
clxxviii. -					+				+			+			n	
clxxxv. -				+					+						n	
cxc.* -					+		+		+	+	+			+		
ccii.* -					+	+			+		+		+	+	n	
Cases 12	—	—	—	1	7	2	2	—	—	2	3	1	4	3	1	—

3rd Week Cases.

cxliii. -						+			+		+	+				
clxvii. -				+					+			+			n	
clxxxii. -					+				+						n	
liii.* -									+		+		+		+	
Cases 4	—	—	—	1	1	1	—	—	—	1	2	2	1	—	1	—

4th Week Cases.

xx.* -									+		+				o	
Cases 1	—	—	—	—	—	—	—	—	—	—	1	—	—	—	o	—

5th Week Cases.

cxv. -									+		+				n	
Cases 1	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—

Total Cases in which there were associated Morbific Circumstances among all the 27 Cases together.	
Cols.	*
1 n. + c. only	1—0
1, 2, 3, 4 - -	8—2
5. Unwholesome local surroundings -	11—3
6. Exposure to erysipelatous or septic infection -	4—1
7. Prevalence of erysepelas and its congeners - -	4—1
8. Exposure to infectious fevers -	0—0
9. Prevalence of infectious fevers -	27—7
10. Injury to or bursting of vesicles -	7—1
11. Improper management or neglect -	8—6
12. Delicacy or illness of vaccinee -	3—0
13 Family unhealthiness or peculiarities - -	6—3
14. Vesicles opened on 8th day - -	7—4
Co-vaccinees, normal -	14
Co-vaccinees + - -	6
Sub. co-vaccinees (+) -	5
Total ulcerative cases* -	7

Dr. Ballard's Memorandum.

Column 10.—*Injury to or Bursting of Vesicles.*

Among the 150 cases of Group I. there were 48 in which at one period or another of the course of the vaccinia the pocks became injured from one cause or another, so as to break the cuticular surface and thus cause an open absorbing spot. Distributed into weeks of commencement of vaccinees' illness, they were as follows:—

Weeks in which Vaccinees' illness commenced.

1st Week.	2nd Week.	3rd Week.	4th Week.	5th Week or later.	Uncertain.	——
xviii.‡ 3rd day. ci.‡ 1st week. lxii.‡ 6th day. lxxviii.§ 1st week. lxxix.§ 1st week. xxiv.‖ 1st week. cxviii.§ 3rd day. cvii.‡ 5th day. cvii.*a*‡ 3rd or 4th day. cl ‖ 6th day. cxxxix.‖ 1st week. cliii. 1st week. clv.*‡ early 1st week. xii.‖ 6th day. clxxii.*† 7th day. clxxv.‖ by 7th day.	xxii. 7th day. xxv.*‖ 11th day. xxix.*‖ 9th day. xxxviii.‖ 8th day. lviii.‖ 6th day. lxviii. 5th day. cxi.† by 8th day. cxx.§ 8th day. cxiii.‖ by 8th day. cli.‖ by 8th day. clxxiv.‖ 2nd day. cxc.* 12th day. cxciii.*‖ 14th to 16th day. lxiii.‖ 2nd week. x.*† 13th day. cci.*‖ 2nd week. cciv.*‖ mid. of 2nd week.	xxi.‖ 4th to 18th day. lxxxviii.‖ 2nd week. cxxvi.*‖ end of 3rd week. clvi. 15th day. clxiv.*‖ about 7th day. clxvii.‖ 7th day. clxix.‖ 19th day. lx.*† by 8th day. cxcvi.*† 2nd or 3rd week.	xxxix.‖ 21st day. cvi.‖ 23rd or 24th day. lii.*‖ 4th week.	xli.*‖ 4th week or later. lxxxi.‖ 29th day.	lix.‖ Uncertain.	Dates = Period when injury or rupture occurred.
16	17	9	3	2	1	

* Ulcerative cases, 15.

Observe that among these 48 cases there were—

Marked † only 4, viz., cxi., x., lx., clxxii., of which lx. was included in Cols. 1, 2, and 4:—
„ ‡ „ 6 „ xviii., ci., lxii., cvii., cvii.*a*, clv., of which the following were included in Cols. 1, 2, 3, or 4:—ci., lxii., cvii., cvii.*a*.
„ § „ 4 „ lxxviii., lxxix., cxviii., cxx., of which the following were included in Cols. 1, 2, 3, or 4:—lxxviii., lxxix., cxviii., cxx., *i.e.*, 9 out of 14 marked †‡ or §.
„ ‖ 29.
Not underlined, 5.

And that as respects the 16 vaccinees taken ill in their 1st week the actual co-vaccinees suffered in 4 cases, of which the following were included in Cols. 1, 2, 3, or 4:—lxxviii., lxxix., cxviii.
„ „ 17 „ „ 2nd „ the actual co-vaccinees suffered in 3 cases, of which cxx. was included in Cols. 2 and 4.
„ „ 9 „ „ 3rd „ the actual co-vaccinees suffered in 1 case:—lx., which was included in Cols. 1, 2, and 4.
„ „ 5 „ „ 4th „ or later, the actual co-vaccinee suffered in 0 cases.

And that as respects the 16 vaccinees taken ill in their 1st week, the subsidiary co-vaccinees suffered in 9 cases, of which the following were included in Cols. 1, 2, 3, or 4:—ci., lxii., lxxviii., lxxix., cxviii., cvii., cvii.*a*
„ „ 17 „ „ 2nd „ the subsidiary co-vaccinees suffered in 1 case only, cxx., which was included in Cols. 2 and 4.
„ „ 14 „ „ 3rd week or later, the subsidiary co-vaccinees suffered in 0 cases.

Observe and compare the dates of injury and those of commencement of illness.

Dr. Ballard's Memorandum.

Column 10—continued.

1st Week Cases.

Columns.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Co-vacc.	Sub. Co-vacc.
xviii. -								+		+	+					(+)
ci. - -				+						+				+		(+)
lxii. -		+		+	+		+			+					o	(+)
lxxviii. -		+							+	+					+	(+)
lxxix. -		+							+	+					+	(+)
xxiv. -						+				+			+		n	
cxviii. -	+		+		+				+	+					+	(+)
cvii. -		+		+						+						(+)
cvii.a -		+		+						+						(+)
cl. - -						+			+	+			+	+	n	
cxxxix. -					+					–			+		n	
cliii. -					+					+	+				o	
clv.* -							+			+	+		+			(+)
clxxii.* -										+					+	
xii. - -										+	+	+	+		n	
clxxv. -						+				+			+		n	
Cases 14	1	5	1	4	4	3	2	1	4	—	4	1	6	2	4	9

2nd Week Cases.

xxii. -		+								+	+				o	
xxv.* -										+	+		+		n	
xxix.* -		+			+	+				+	+	+	+		n	
xxxviii. -						+				+		+	+	+	n	
lviii. -										+			+		n	
lxviii. -					+	+				+		+	+		o	
cxi. - -										+		+	+		+	
cxx. -		+		+		+				+					+	(+)
cxiii. -					+					+	+				n	
cli. - -					+		+		+	+					n	
clxxiv. -			+	+		+				+		+			n	
cxc.* -					+		+		+	+	+			+		
cxciii.* -					+					+	+				n	
lxiii. -						+				+	+	+	+	+	n	
x.* - -										+	+		+		+	
cci.* -					+					+		+			n	
cciv.* -		+			+					+	+				n	
Cases 17	—	4	1	2	8	6	2	—	2	—	9	7	8	3	3	1

3rd Week Cases.

xxi. -						+	+			+	+				n	
lxxxviii. -					+					+	+			+	n	
cxxvi.* -										+				+	n	
clvi. -										+	+				n	
clxiv.* -					+					+	+			+	n	
clxvii. -				+					+	+		+			n	
clxix. -				+				+		+					n	
ix.* - -	+	+				+				+					+	
cxcvi.* -								+		+	+	+	+			
Cases 9	1	1	—	2	2	2	1	2	1	—	5	2	1	3	1	—

4th Week Cases.

xxxix. -					+					+	+				n	
cvi. -										+	+				n	
lii.* - -					+	+				+	+		+		n	
Cases 3	—	—	—	—	2	1	—	—	—	—	3	—	1	—	0	—

5th Week or later Cases.

xli.*- -										+	+				n	
lxxxi. -										+			+	+	n	
Cases 2	—	—	—	—	—	—	—	—	—	—	1	—	1	1	0	—

Week uncertain.

lix. - -										+	+	+			n	
Cases 1	—	—	—	—	—	—	—	—	—	—	1	1	—	—	?	—

Total Cases in which there were associated Morbific Circumstances among all the 48 Cases together.

Cols.	s
1 n. + c. only -	2—1
1, 2, 3, 4 - -	15—3
5. Unwholesome surroundings at home - -	16—7
6. Exposure to erysipelatous or septic infection -	12—3
7. Erysipelas or its congeners prevalent - -	5—2
8. Exposure to infectious fevers -	2—1
9. Infectious fevers prevalent - -	7—1
10. Injury or bursting of vesicles -	48—15
11. Improper management or neglect-	23—11
12. Delicacy on illness of vaccinee -	11—2
13. Family unhealthiness or peculiarities - - -	17—6
14. Vesicles opened on 8th day -	9—3

Co-vaccinees, normal -	29
Co-vaccinees – - -	2
Sub. co-vaccinees (+) -	10
Total ulcerative cases*	15

Dr. Ballard's Memorandum.

Column 11.—*Improper Management or Neglect.*

Among the 150 cases of Group I. there are 50 in which improper management of the vesicles or of the child (of one kind or another) or of neglect are reported. Such improper management includes the application to the pocks of a variety of unnecessary and often dangerous materials and the use of a shield. Distributed in weeks of commencing illness of the vaccinees they are as follows :—

Weeks in which Vaccinees' illness commenced.

1st Week.	2nd Week.	3rd Week.	4th Week.	5th Week or later.	Uncertain.	——
xviii.‡ late. xi. 1st day. xxv.*‡ 2nd week. xxvii.*‡ 2nd week. cliii. 1st week. clv.*‡ from 7th day. xii.‖ 5th day. cxcvii. from 8th day.	xxii. 10th or 11th days. xxv.*‖ 8th or 10th days. xxix.*‖ 10th day. lxiii.‖ On rupture of pocks. lxxx.*‖ 8th day. x.*† 2nd week. cxiii.‖ 8th day. cxii.‖ 2nd week. cxxiii.† 8th or 9th day. cxxii. ? cxxxv. ? cxxxi.*‖ 1st and 9th days. cxlv.‖ 3rd day. clii.* from 4th day. clxvi.* from 8th day. cxc.* 2nd week. cxci.† from 10th day. cxcix. from 8th day. cxciii.*‖ 14th day. ccii.*‖ 8th day. cciv.*‖ After injury to pocks.	cciii.*‖ 3rd week. cxcvi.* 3rd week. liii.*† To ulcer. xxi.‖ 3rd week. lxxxviii.‖ 2nd week. xci. Throughout. ciii.‖ from 15th day. cv.*‖ from 8th day. cix.‖ ? cxliii. First 2 weeks. cxlvi.‖ from 15th day. cxlix.‖ Before any redness. clxiv.*‖ from 11th or 12th day. clxxiii.*‡ After scabs become brown.	lii.*‖ 4th week. xx.* from 8th day. xxxix.‖ 3rd week. cvi.‖ 2nd week.	xli.*‖ After scabs fallen. cxv.‖ from 8th day.	lix.‖ Throughout.	Dates = Period on or from which cause was applied.
8	21	14	4	2	1	

* Ulcerative cases, 23.

Observe that among these 50 cases there were—

Marked † only 4, viz., x., cxxiii., cxci., liii., of which cxxiii. was included in Col. 1.
,, ‡ ,, 5, viz., xviii., xxxv., xxvii., clxxiii., clv., of which the following were included in Cols. 1, 3, or 4:— xxxv., clxxiii.
,, § none.
,, ‖ 27.
Unmarked, 14.

And that as respects the 8 vaccinees taken ill in their 1st week, the actual co-vaccinees suffered in 0 cases.
,, ,, 21 ,, ,, 2nd ,, ,, ,, 3 ,, of which cxxiii. was included in Col. 1.
,, ,, 14 ,, ,, 3rd week, the actual co-vaccinees suffered in 1 case.
,, ,, 6 ,, ,, 4th ,, or later, the actual co-vaccinees suffered in 0 cases.

And that as respects the 8 vaccinees taken ill in their 1st week, the subsidiary co-vaccinees suffered in 4 cases, of which xxxv. was included in Col. 4.
,, ,, 21 ,, ,, 2nd week, the subsidiary co-vaccinees suffered in 0 cases.
,, ,, 14 ,, ,, 3rd ,, ,, ,, ,, 1 case, clxxiii., which was included in Col. 4.
,, ,, 6 ,, ,, 4th week or later, the subsidiary co-vaccinees suffered in 0 cases.

As to the implication of actual co-vaccinees in 3 cases (not in Cols. 1, 2, 3, or 4), x. had only ½ co-vaccinee whose arm became inflamed after opening of pocks for use. Only ½ co-vaccinee of cxci. suffered, who belonged to a dirty family ; of the 2 co-vaccinees of liii., one had discharging spots only, the other was inflamed also. Scarlatina was prevalent.

As to the implication of the subsidiary co-vaccinees in 3 cases (not in Cols. 1, 2, 3, or 4), those of xviii. may have been due to the same exposure to measles infection as xviii. at the station. As to those of xxvii. it is quite possible from the report that they were really co-vaccinees and that all were vaccinated from a child with undue inflammation on 8th day. As to those of clv. it is to observed that erysipelas was prevalent.

Observe and compare dates when mismanagement commenced and those of commencement of illness.

Dr. Ballard's Memorandum.

Column 11.—*continued.*

1st Week Cases.

Columns.	1 n + c	2	3	4	5	6	7	8	9	10	11	12	13	14	Co-vacc.	Sub. Co-vacc.
xviii. - -								+		+	+					(+)
xl. -				+	+						+	+	+			
xxxv.*				+					+		+			+		(+)
xxvii.* -					+	+					+		+			(+)
cliii. -					+					+	+				o	
clv.* - -							+			+	+		+			(+)
xii. - -										+	+	+	+		n	
excvii. -				+			+				+					
Cases 8	—	—	—	3	3	1	2	1	1	4	—	2	4	1	o	4

2nd Week Cases.

xxii. -		+								+	+				o	
xxv.* -										+	+		+		n	
xxix.* -		+			+	+				+	+	+	+		n	
lxiii. -						+				+	+	+	+	+	n	
lxxx.* -					+	+					+		+	+	n	
x.* - -										+	+		+		+	
cxiii. - -					+					+	+				n	
cxii. -											+	+	+		n	
cxxiii. -	+				+						+			+	+	
cxxii. -					+						+					
cxxxv. -											+					
cxxxi.* -									+		+		+		n	
cxlv. -					+						+	+			n	
clii.* -					+	+					+					
clxvi.* -				+	+						+			+		
cxc.* -					+		+		+	+	+			+		
cxci. - -					+						+			+	+	
cxcix. -							+				+					
cxciii.* -					+					+	+				n	
ccii.* -					+	+			+		+		+	+	n	
cciv.* -		+			+					+	+				n	
Cases 21	1	3	—	1	13	5	2	—	3	9	—	4	8	7	3	—

3rd Week Cases.

cciii.* -											+			+	n	
ccxcvi.* -								+		+	+	+	+		n	
liii.* -									+		+		+		+	
xxi. - -						+	+			+	+				n	
lxxxviii. -					+					+	+			+	n	
xci. - -					+	+					+		+	+		
ciii. -											+				n	
cv.* -					+						+	+	+		n	
cix. - -											+			+	n	
cxliii. -						+			+		+	+				
cxlvi. -										+	+				n	
cxlix. -					+						+			+	n	
clxiv.* -					+					+	+			+	n	
clxxiii.* -				+	+						+					(+)
Cases 14	—	—	—	1	6	3	1	1	2	5	—	3	4	6	1	1

4th Week Cases.

lii.* - -					+	+				+	+		+		n	
xx.* - -									+		+				o	
xxxix. -					+					+	+				n	
cvi. - -										+	+				n	
Cases 4	—	—	—	—	2	1	—	—	1	3	—	—	1	—	o	—

5th Week or later Cases.

xli*. -										+	+				n	
cxv. -									+		+				n	
Cases 2	—	—	—	—	—	—	—	—	1	1	—	—	—	—	o	—

Uncertain.

lix. - -										+	+	+			n	
Cases 1	—	—	—	—	—	—	—	—	—	1	—	1	—	—	o	—

Total Cases in which there were associated Morbific Circumstances among all the 50 Cases together.	
Cols.	*
1. n. + c. only -	1—0
1, 2, 3, 4 - -	9—5
5. Unwholesome surroundings at home -	24—13
6. Exposure to erysipelatous or septic infection -	10—6
7. Erysipelas or its congeners prevalent - -	5—2
8. Exposure to infectious fevers -	2—1
9. Infectious fevers prevalent - -	8—6
10. Injury to or bursting of vesicles -	23—11
11. Improper management or neglect	50—23
12. Delicacy or illness of vaccinee -	10—3
13. Family unhealthiness or peculiarities - -	17—12
14. Vesicles opened on 8th day -	14—7
Co-vaccinees, normal -	27
Co-vaccinees + - -	4
Sub. co-vaccinees (+) -	5
Total ulcerative cases* -	23

Column 12.—*Delicacy or Illness of Vaccinee.*

Dr. Ballard's Memorandum.

Among the 150 cases of Group I. there were 27 in which the vaccinee was reported as delicate, ill nourished, or in various ways unhealthy, so as to have rendered the child unfit to be subjected to vaccination. Distributed in weeks of commencement of vaccinees illness they were as follows:—

Weeks in which Vaccinees Illness commenced.					
1st Week.	2nd Week.	3rd Week.	4th Week.	5th Week or later.	Uncertain.
xl. c.*‡ xii.‖	xxix.*‖ xxxviii.‖ lxiii.‖ lxviii. cxi.† cxxxii.*‖ cxii.‖ cxxxiii.‖ cxlv.‖ clxxiv.‖ clxxviii.‖ cxcii.† cci.*‖	xcii.‖ cv.*‖ cxliii. clxvii.‖ cxxi.*‖ cxxix.*‖ cxcvi.*	None.	clxxvi.*‖	lix.‖ cliv.‡ clxxix.‡
3	13	7	—	1	3

* Ulcerative cases, 9.

Observe that among these 27 cases there were:—

Marked † only 2, viz., cxi., cxcii., neither of which was included in Cols. 1, 2, 3, or 4.
" ‡ " 3, viz., c., cliv., clxxix., of which all were included in Col 4.
" § 19.
Unmarked, 4.

And that as respects the 3 vaccinees taken ill in their 1st week, the actual co-vaccinees suffered in 0 cases.
" " 13 " " 2nd " " " 2 "
" " 8 " " later " " " 0 "

And that as respects the 3 vaccinees taken ill in their 1st week, the subsidiary co-vaccinees suffered in 1 case:—c. included in Col. 4.
" " 21 " " later " " " 0 case
" " 3 " " uncertain " " " 2 " :—cliv. clxxix. both included in Col. 4.

The implication of the co-vaccinees of cxi. is unexplained, except that there appears, notwithstanding the stated normal character of the vaccinifer, to have been some irritating quality in the lymph or some accidental undiscovered cause operating at the place or time of the vaccination. That of the co-vaccinees of cxcii. is also left unexplained.

This cause does not appear to be generally operative in cases commencing before the 2nd week. As respects the cases commencing in 1st week, xl. and c.'s early commencement was connected with faults under Col. 4. xii.'s early commencement is associated with the great mistake of vaccinating the child at all in such a condition, and with injury to pocks believed to have been received on 6th day.

Column 12—*continued.*

1st Week Cases.

Eolumns.	1 n + c	2	3	4	5	6	7	8	9	10	11	12	13	14	Co. Vacc.	Sub. Co. Vacc.
xl. - -				+	+						+	+	+			
c.* -				+								+		+		(+)
xii. - -										+	+	−	+		n	
Cases 3	—	—	—	2	1	—	—	—	—	1	2	—	2	1	0	1

2nd Week Cases.

xxix.* -		+			+	+				+	+	+	+		n	
xxxviii. -						+				+		+	+	+	n	
lxiii. - -						+				+	+	+	+	+	n	
lxviii. -					+	+				+		+	+		o	
cxi. - -										+		+	+		+	
cxxxii.* -		+			+							+	+		n	
cxii. - -											+	+	+		n	
cxxxiii. -												+		+	n	
cxlv. -					+						+	+			n	
clxxiv. -			+	+		+				+		+			n	
clxxviii. -					+				+			+			n	
cxcii. -												+			+	
cci.* -					+					+		+			n	
Cases 13	—	2	1	1	6	5	—	—	1	7	4	—	7	3	2	—

Total Cases in which there were associated Morbific Circumstances among all the 27 Cases together.	
Cols.	*
1 n. + c. only -	0—0
1, 2, 3, 4 - -	9—4
5. Unwholesome surroundings at home	13—6
6. Exposure to erysipelatous or septic infection - -	6—1
7. Erysipelas or its congeners prevalent - - -	0—0
8. Exposure to infectious fevers -	1—1
9. Infectious fevers prevalent - -	3—0
10. Injury to or bursting of vesicles -	11—3
11. Improper management or neglect -	10—3
12. Delicacy or illness of vaccinee -	27—9
13. Family unhealthiness or peculiarities - - -	13—5
14. Vesicles opened on 8th day -	4—1

Dr. Ballard's Memorandum.

Column 12—continued.

3rd Week Cases.

Columns.	1 n.+c.	2	3	4	5	6	7	8	9	10	11	12	13	14	Co-vacc.	Sub. Co-vacc.
xcii. -					+							+			n	
cv.* -					+						+	+	+		n	
cxliii. -						+			+		+	+				
clxvii. -				+					+	+		+			n	
cxxi.* -												+			n	
cxxix.* -		+			+							+	+		n	
cxcvi.* -								+		+	+	+	+			
Cases 7	—	1	—	1	3	1	—	1	2	2	3	—	3	—	0	—
5th Week or Later Cases.																
clxxvi.* -					+							+			n	
Cases 1	—	—	—	—	1	—	—	—	—	—	—	—	—	—	0	—
Uncertain.																
lix. - -										+	+	+			n	
cliv. - -				+	+							+	+			(+)
clxxix. -				+	+							+			n	(+)
Cases 3	—	—	—	2	2	—	—	—	—	1	1	—	1	—	0	2

Total Cases in which there were associated Morbific Circumstances among all the 27 Cases together.

Co-vaccinees, normal - 19
Co-vaccinees + - 2
Sub. co-vaccinees (+) - 3

Total ulcerative cases* - 9

Column 13.—Family Unhealthiness or Peculiarities.

Among the 150 cases of Group I. there are 43 cases entered in this column. The conditions of unhealthiness or peculiarities thus counted in are very varied, and embrace acute and chronic states of ill-health in the family generally or in individual members of it, as well as various morbid tendencies discovered by the inspectors. Distributed in weeks of vaccinees commencing illness they are as follows:—

Weeks in which Vaccinees' Illness commenced.

1st Week.	2nd Week.	3rd Week.	4th Week.	5th Week or later.	Uncertain.
xv.‖	xxv.*‖	liii.*†	lii.*‖	lxxxi.‖	cliv.‡
xvii.‖	xxix.*‖	xlii.*			
xl.	xxxviii.‖	xliv.‖			
xxvii.*‡	lviii.‖	xci.			
xciv.*‡	lxiii.‖	xcviii.			
xxiv.‖	lxviii.	cv.*‖			
cxxx.‖	lxxx.*‖	cxciv.‖			
cl.‖	x.*†	cxxix.*‖			
civ.‖	cxi.†	cxcvi.*			
cxxxix.‖	cxxxii.*‖				
clv.*‡	cxxxvi.‖				
clxxv.‖	cxii.‖				
xii.‖	cxxxi.*‖				
	cxliv.				
	clix.‖				
	cxcv.‖				
	ccii.*‖				
	cxlviii.*‖				
13	18	9	1	1	1

*Ulcerative cases, 17.

Observe that among these 43 cases there were—

Marked † only 3, viz., x., cxi., liii., none of which were included in Cols. 1, 2, 3, or 4.
,, ‡ ,, 4 ,, xxvii., xciv., clv., cliv., of which the following were included in Col. 4:—xciv., cliv.
,, ‖ ,, 29
Unmarked, 7

And that as respects the 13 vaccinees taken ill in their 1st week, actual co-vaccinees were attacked in 0 cases.
,, ,, 18 ,, ,, 2nd ,, ,, ,, 2 ,, neither of which were included in Cols. 1, 2, 3, or 4.
,, ,, 9 ,, ,, 3rd ,, actual co-vaccinees were attacked in 1 case, which was not included in Cols. 1, 2, 3, or 4.
,, ,, 2 ,, ,, later on, actual co-vaccinees were attacked in 0 case.

Dr. Ballard's Memorandum.

And that as respects the 13 vaccinees taken ill in their 1st week, subsidiary co-vaccinees were attacked in 3 cases, of which xciv. was included in Col. 4.

" " 29 " " later on, subsidiary co-vaccinees were attacked in 0 cases.

" " 1 " " in uncertain week, subsidiary co-vaccinees were attacked in 1 case, cliv., included in Col. 4.

As to implication of the co-vaccinees in 3 cases (not in Cols. 2, 3, 4) for x. *see* note on Col. 11; for cxi. *see* note on Col. 12; and for liii., *see* note on Col. 11.

As to the implication of subsidiary co-vaccinees in 2 cases (not in Cols. 2, 3, 4) for xxvii. and for clv., *see* note on Col. 11.

Column 13—continued.

1st Week Cases.

Columns.	1 n.+c.	2	3	4	5	6	7	8	9	10	11	12	13	14	Co-vacc.	Sub. Co-vacc.
xv. -					+								+		n	
xvii. -					+	+							+		n	
xl. -				+	+						+	+	+			
xxvii.* -					+	+					+		+			(+)
xciv.* -				+									+			(+)
xxiv. -						+				+			+		n	
cxxx. -													+		n	
cl. -						+			+	+			+	+	n	
civ. -	+		+		+								+		n	
cxxxix. -					+					+			+		n	
clv.* -							+			+	+		+			(+)
clxxv. -						+				+			+		n	
xii. -										+	+	+	+		n	
Cases 13	1	—	1	2	6	5	1	—	1	6	4	2	—	1	o	3

2nd Week Cases.

xxv.* -										+	+		+		n	
xxix.* -		+			+	+				+	+	+	+		n	
xxxviii. -						+				+		+	+	+	n	
lviii. -										+			+			
lxiii. -						+				+	+	+	+	+	n	
lxviii. -					+	+				+		+	+		o	
lxxx.* -					+	+					+		+	+	n	
x.* -										+	+		+		+	
cxi. -										+		+	+		+	
cxxxii.* -		+			+							+	+		n	
cxxxvi. -					+				+				+		n	
cxii. -											+	+	+		n	
cxxxi.* -									+		+		+		n	
cxliv. -									+				+	+	o	
clix. -						+							+	+	n	
cxcv. -					+								+		n	
ccii.* -					+	+			+		+		+	+	n	
cxlviii.* -					+	+							+		n	
Cases 18	—	2	—	—	8	8	—	—	4	8	8	7	—	6	2	—

3rd Week Cases.

liii.* -									+		+		+		+	
xlii.* -					+								+		o	
lxiv. -						+							+		n	
xci. -					+	+					+		+	+		
xcviii. -						+							+	+		
cv.* -					+						+	+	+		n	
cxciv. -		+											+		n	
cxxix.* -		+			+							+	+		n	
cxcvi.* -								+		+	+	+	+			
Cases 9	—	2	—	—	4	3	—	1	1	1	4	3	—	2	1	—

4th Week Cases.

lii.* -					+	+				+	+		+		n	
Cases 1	—	—	—	—	1	1	—	—	—	1	1	—	—	—	o	—

Total Cases in which there were associated Morbific Circumstances among all the 43 Cases together.	*
Cols.	
1 n.+c. only -	1—0
1, 2, 3, 4 - -	8—4
5. Unwholesome surroundings at home - -	20—10
6. Exposure to erysipelatous or septic infection	17—6
7. Erysipelas or its congeners prevalent - -	1—1
8. Exposure to infectious fevers -	1—1
9. Infectious fevers prevalent -	6—3
10. Injury to or bursting of vesicles -	17—6
11. Improper management or neglect	17—12
12. Delicacy or illness of vaccinee -	13—5
13. Family unhealthiness or peculiarities - -	43—17
14. Vesicles opened 8th day -	10—2
Co-vaccinees, normal -	28
Co-vaccinees + -	3
Sub. co-vaccinees (+)	4
Total ulcerative cases*	17

Column 13—*continued.*

5th Week Cases.

Columns.	1 n+c.	2	3	4	5	6	7	8	9	10	11	12	13	14	Co-vacc.	Sub. Co-vacc.
lxxxi. -										+			+	+	n	
Cases 1	—	—	—	—	—	—	—	—	—	1	—	—	—	1	o	—
Uncertain.																
cliv. -				+	+							+	+			(+)
Cases 1	—	—	—	1	1	—	—	—	—	—	—	1	—	—	o	1

Column 14.—*Vesicles opened on 8th Day.*

Among the 150 cases of Group I. there were 46 in which the fact of the pocks having been opened by the operator on the 8th day, whether for use or not for use of the lymph is, recorded, viz., :—29 for use and 17 *not* for use. Distributed into weeks of attacks of vaccinees they were as follows :—

Weeks in which Vaccinees' Illness commenced.					
1st Week.	2nd Week.	3rd Week.	4th Week.	5th Week or later.	Uncertain.
c.*‡ ci.‡ xxxv.*‡ lxxxv.† cxvi.‖ cxvii.*§ cl.‖ clxxxviii.*‖	xvi.‡ xxiii.‖ xxxiv. xxxviii.‖ xliv.‖ lxiii.‖ lxx.* lxxx.*‖ lxxxiv.*† lxxxvi.‖ cxiv.‖ cxxiii.† cxxxiii.‖ cxxviii.† cxliv. clix.‖ clxvi.* clxxvii.‖ clxviii.‖ cxc.* cxci.† ccii.*‖ xix.*‖	xxviii. lxxxviii.‖ xci. xcviii. cix.‖ cxxvi.*‖ cxlix.‖ clxiv.*‖ cc.‖ cciii.*‖ clvi.*‖	lxvii.‖	xliii.‖ lxxxi.‖ cxxiv.‖	
8	23	11	1	3	—

* Ulcerative cases, 15.

Observe that among these 46 cases there were—

Marked † only 5, viz., lxxxv., lxxxiv., cxxiii., cxxviii., cxci., of which the following were included in Col. 3 :—lxxxv., lxxxiv.

,, ‡ ,, 4, viz., c., ci., xxxv., xvi., of which the following were included in Col. 4 :—c., ci., xxxv.

,, § ,, 1, viz., cxvii., which was included in Col. 4.

,, ‖ 28.

Unmarked, 8

And that as respects the 8 cases taken ill in their 1st week, the actual co-vaccinees suffered in 2 cases :—lxxxv., cxvii. included in Cols. 3 or 4.

,, ,, 23 ,, ,, 2nd week, the actual co-vaccinees suffered in 4 cases, of which were included in Col. 3 :—lxxxiv., cxxiii.

,, ,, 15 ,, ,, later, the actual co-vaccinees suffered in 0 cases.

And that as respects the 8 cases taken ill in their 1st week, subsidiary co-vaccinees suffered in 4 cases :—c., ci., xxxv., cxvii., all of which were included in Cols. 3 or 4.

,, ,, 23 ,, ,, 2nd week, subsidary co-vaccinees suffered in 1 case.

,, ,, 15 ,, ,, later ,, ,, ,, 0 case.

Of course, the opening of vesicles on 8th day could not have been as cause of illnesses commencing until after the expiration of the 1st week, but might have been associated as cause with subsequent progress of case.

Nor could it have had anything to do with the co-vaccinees or subsidiary co-vaccinees, unless indeed the same lancet uncleansed had been used upon them also, or other circumstances referred to in Cols. 3 and 4 had been operative.

Dr. Ballard's Memorandum.

Among the 150 cases of Group I. there were 59 in which it is recorded that the pocks were *not* opened on the 8th day. Distributed into weeks of commencing illness of the vaccinees, they are as follows :—

Cases in which it is recorded that Pocks were *not* opened on 8th day. Weeks in which Vaccinees Illness commenced.					
1st Week.	2nd Week.	3rd Week.	4th Week.	5th Week or later.	Uncertain.
xvii.‖ xviii.‡ xl. lxxxiii.† xxxi.‡ lxii.‡ xxvii.*‡ lxxviii.§ xxix.§ xciv.*‡ xxxiii. ‖ cxxx.‖ cvii.‡ cvii.*a‡ cxli.† cxlii.† cliii. clxxii.*† clxxv.‖ clxxxix.*† xii.‖ cxcviii.	xxii. xxvi. xxxvii. x.*† cxi.† cxxxii.*‖ cxiii.‖ cxxxvi.‖ cxxv.† cxxxi.*‖ clxxiv.‖ clxxviii.‖ cxcii.† cxcv.‖ cxcix. lxxxii.*‖ cxlviii.*‖ cxciii.*‖ cci.*‖ cciv.*‖	xlii.* lxiv.‖ lxxxvii.‖ cv.*‖ cxliii. clxvii.‖ clxix.‖ clxxiii.*‡ cxciv.‖ lx.*† cxxix.*‖	xxxix.‖ cvi.‖	xli.*‖ clxxvi.*‖	lix.‖ clxxix.*‖
22	20	11	2	2	2

* Ulcerative cases, 19.

The number of cases commencing in the second and following weeks is nearly the same in the two series. (But *see* Addendum A., page 155.)

But howsoever this may be the practice adopted by some vaccinators of puncturing pocks when lymph is not required on the 8th day can do no possible good, and ought to be discouraged.

Column 14—*continued.*

1st Week Cases.

Columns.	1 n.+c.	2	3	4	5	6	7	8	9	10	11	12	13	14	Co-vacc.	Sub. Co-vacc.
e.* - -				+								+		+		(+)
ci. - -				+						+				+		(+)
xxxv.* -				+					+		+			+		(+)
lxxxv. -			+											+	+	
cxvi. -		+					+		+					+	n	
cxvii.*				+	+				+					+	+	(+)
cl. - -						+			+	+			+	+	n	
clxxxviii.*					+			+						+	n	
Cases 8	—	1	1	4	2	1	1	1	4	2	1	1	1	—	2	4

2nd Week Cases.

xvi. - -														+		(+)
xxiii. -														+	n	
xxxiv. -				+										+		
xxxviii. -						+				+		+	+	+	n	
xliv. -														+	n	
lxiii. -						+				+	+	+	+	+	n	
lxx.* -					+									+		
lxxx.* -					+	+					+		+	+	n	
lxxxiv.* -			+											+	+	
lxxxvi. -														+	n	
cxiv. -					+									+	n	
cxxiii. -	+				+						+			+	+	
cxxxiii. -												+		+	n	
cxxviii. -						+								+	+	
cxliv. -									+				+	+	o	
clix. -						+							+	+	n	
clxvi.* -				+	+						+			+		
clxxvii. -								+						+	n	
clxviii. -					+		+							+	n	
cxc.* -					+		+		+	+	+			+		
cxci. -					+						+			+	+	
ccii.* -					+	+			+		+		+	+	n	
xix.* -					+									+	o	
Cases 23	1	—	1	2	10	6	2	1	3	3	7	3	6	—	4	1

Total Cases in which there were associated Morbific Circumstances among all the 46 Cases together.	*
Cols.	
1 n.+c. - -	1—0
1, 2, 3, 4 -	11—6
5. Unwholesome surroundings at home - -	19—9
6. Exposure to erysipelatous or septic infection	9—2
7. Erysipelas or its congeners prevalent - -	5—2
8. Exposure to infectious fevers	3—1
9. Infectious fevers prevalent -	7—4
10. Injury to or bursting of vesicles -	9—3
11. Improper management or neglect	14—7
12. Delicacy or illness of vaccinee -	4—1
13. Family unhealthiness or peculiarities - -	10—2
14. Vesicles opened on 8th day -	46—15
Co-vaccinees, normal -	28
Co-vaccinees + - -	6
Sub. co-vaccinees (+) -	5
Total ulcerative cases *	15

Dr. Ballard's Memorandum.

Column 14—*continued.*

3rd Week Cases.

Columns.	1 n.+c.	2	3	4	5	6	7	8	9	10	11	12	13	14	Co-vacc.	Sub. Co-vacc.
xxviii. -														+		
lxxxviii. -					+					+	+			+	n	
xci. - -					+	+					+		+	+		
xcviii. -						+							+	+	n	
cix. - -											+			+	n	
cxxvi.* -										+				+	n	
cxlix. -					+						+			+	n	
clxiv.* -					+					+	+			+	n	
cc. - -							+	+						+	n	
cciii.* -											+			+	n	
clvi.* -		+					+							+	n	
Cases 11	—	1	—	—	4	2	2	1	—	3	6	—	2	—	o	—

4th Week Cases.

lxvii. -					+									+	n	
Cases 1	—	—	—	—	1	—	—	—	—	—	—	—	—	—	o	—

5th Week or later Cases.

xliii. -					+									+	n	
lxxxi. -										+			+	+	n	
cxxiv. -					+									+	n	
Cases 3	—	—	—	—	2	—	—	—	—	1	—	—	1	—	o	—

Cases in which it is recorded that pocks were *not* opened.—Total 59.

1st Week Cases.

Columns.	1 n.+c.	2	3	4	5	6	7	8	9	10	11	12	13	14	Co-vacc.	Sub. Co-vacc.
xvii. -					+	+					+		+		n	
xviii. -								+		+	+					(+)
xl. - -				+	+						+	+	+			
lxxxiii. -		+	+	+											+	
xxxi. -				+												(+)
lxii. -		+		+	+		+			+						(+)
xxvii.* -					+	+					+		+			(+)
lxxviii. -		+							+	+					+	(+)
lxxix. -		+							+	+					+	(+)
xciv.* -				+									+		o	(+)
xxxiii. -					+	+	+								n	
cxxx. -													+		n	
cvii. -		+		+						+						(+)
cvii.*a* -		+		+						+						(+)
cxli. -						+		+							+	
cxlii. -						+		+							+	
cliii. -					+					+	+				o	
clxxii.* -															+	
clxxv. -						+							+		n	
clxxxix.* -			+		+		+								+	
xii. -										+	+	+	+		n	
cxcviii. -					+		+		+							
Cases 22	—	6	2	7	8	6	4	3	3	8	5	2	7	—	7	9

Total Cases in which there were associated Morbific Circumstances among all the 59 Cases together.	Cols. *
1 n.+c. - - -	1—1
2, 3, 4 - -	28—6
5. Unwholesome surroundings at home - -	24—12
6. Exposure to erysipelatous or septic infection	11—3
7. Erysipelas or its congeners prevalent - -	6—1
8. Exposure to infectious fevers -	4—1
9. Infectious fevers prevalent -	9—1
10. Injury to or bursting of vesicles -	23—6
11. Improper management or neglect	19—8
12. Delicacy or illness of vaccinee -	15—5
13. Family unhealthiness or peculiarities - - -	19—9
14. Vesicles not opened on 8th day -	59—19

Dr. Ballard's Memorandum.

Column 14—continued.

2nd Week Cases.

Columns.	1 n.+c	2	3	4	5	6	7	8	9	10	11	12	13	14	Co-vacc.	Sub. Co-vacc.
xxii. -		+								+	+				o	
xxvi. -																
xxxvii. -																
x.* - -										+	+		+		+	
cxi. - -										+		+	+		+	
cxxxii.* -		+			+							+	+		n	
cxiii. -					+					+	+				n	
cxxxvi. -					+				+				+		n	
cxxv. -									+						+	
cxxxi.* -									+		+		+		n	
cixxiv. -			+	+		+				+		+			n	
clxxviii. -					+				+			+			n	
cxcii. -												+			+	
cxcv. -					+								+		n	
cxcix. -							+				+					
xxxii.* -															n	
clxviii.* -					+	+							+		n	
cxciii.* -					+					+	+				n	
cci.* -					+					+		+			n	
cciv.*		+			+					+	+				n	
Cases 20	—	3	1	1	9	2	1	—	4	8	7	6	7	—	4	—

3rd Week Cases.

xlii.* -					+								+		o	
lxiv.- -						+							+		n	
lxxxvii. -							+								n	
cv.* - -					+						+	+	+		n	
cxliii. -						+			+		+	+				
clxvii. -				+					+	+		+			n	
clxix. -				+				+		+					n	
clxxiii.* -				+	+						+					(+)
exciv. -		+											+		n	
lx.* - -	+	+		+		+				+					+	
cxxix.* -		+			+							+	+		n	
Cases 11	1	3	—	4	4	3	1	1	2	3	3	4	5	—	1	1

4th Week Cases.

xxxix. -					+					+	+				n	
cvi. - -										+	+				n	
Cases 2	—	—	—	—	1	—	—	—	—	2	2	—	—	—	o	—

5th Week or later Cases.

xli.* -										+	+				n	
clxxvi.* -					+							+			n	
Cases 2	—	—	—	—	1	—	—	—	—	1	1	1	—	—	o	—

Uncertain.

lix. -										+	+	+			n	
clxxix. -				+	+							+			n	(+)
Cases 2	—	—	-	1	1	—	—	—	—	1	1	2	—	—	o	1

Total Cases in which there were associated Morbific Circumstances among all the 59 Cases together.	
Co-vaccinees, normal -	30
Co-vaccinees + - -	12
Sub. co-vaccinees (+)-	11
Total ulcerative cases*	19

Dr. Ballard's Memorandum.

GROUP I.

Indications furnished by Occurrence of Abnormalities among Actual Co-vaccinees as respects efficient operation of the various circumstances tabulated.

	Total Number.	Known to have had Co-vaccinee.	Number of Cases in which Co-vaccinees marked +.
All cases of Group I. taken together	150	105	23 or between $\frac{1}{5}$ and $\frac{1}{4}$.
Cols.			
1 (n. + c. only) (omitting for reason assigned (supra) Nos. xviii., clii., and clxxxiii.)	4	4	3 „ $\frac{3}{4}$
2. Unfitness of vaccinifer	16	12	5 „ about $\frac{1}{3}$ } $\frac{8}{16}$ or $\frac{1}{2}$.
3. Vaccinator personally infective	9	8	6 „ $\frac{3}{4}$.
4. „ faulty procedures	24	9	4 „ about $\frac{1}{2}$.
[1, 2, 3, 4, together	42	25	12 „ „ $\frac{1}{2}$.]
5. Unwholesome surroundings at home	62	44	5 „ „ $\frac{1}{9}$.
6. Exposure to erysipelatous or septic infection	30	22	5 „ between $\frac{1}{5}$ and $\frac{1}{4}$.
7. Erysipelas or its congeners prevalent	15	9	1 „ $\frac{1}{9}$.
8. Exposure to infectious fevers	9	7	3 „ $\frac{3}{7}$.
9. Infectious fevers prevalent	27	20	6 „ between $\frac{1}{4}$ and $\frac{1}{3}$.
10. Injury to or bursting of vesicles	48	37	8 „ $\frac{1}{3}$ to $\frac{1}{4}$.
11. Improper management or neglect	50	27	4 „ $\frac{1}{8}$.
12. Debility or illness of vaccinee	27	21	2 „ $\frac{1}{15}$.
13. Family unhealthiness or peculiarities	43	31	3 „ about $\frac{1}{10}$.
14. Vesicles opened on 8th day	46	34	6 „ $\frac{1}{7}$.

Note that, as might have been mostly expected, the proportion of cases in which co-vaccinees are marked + is *above the average* of all the cases in the group in Cols. 1, 2, 3, 4, 9, 8, and *below* the average decidedly Cols. 5, 7, 11, 12, 13, 14.

[As respects Cols. 1, 7, and 8, the total numbers of cases are too small for any stress to be laid upon this point, and so would be Cols. 2 and 3 were it not that the three Cols. 2, 3, and 4 taken together furnish similar results.]

Indications furnished by Occurrence of Abnormalities among Subsidiary Co-Vaccinees as respects efficient operation of the various circumstances tabulated.

	Total Number.	Number of Cases in which Subsidiary Co-vaccinees marked (+).
All cases of Group I. taken together	150	21 or about $\frac{1}{7}$.
Cols.		
1 n. + c. only (omitting Nos. xviii., clii., and clxxxiii.)	4	1 „ $\frac{1}{4}$
2. Unfitness of vaccinifer	16	6 „ between $\frac{1}{3}$ and $\frac{1}{2}$ } $\frac{7}{16}$ = about $\frac{1}{3}$.
3. Vaccinator personally infective	9	1 „ $\frac{1}{9}$.
4. „ faulty procedures	24	14 more than $\frac{1}{2}$.
[1, 2, 3, 4, together	42	17 or about $\frac{2}{5}$.]
5. Unwholesome surroundings at home	62	7 „ $\frac{1}{9}$.
6. Exposure to erysipelatous or septic infection	30	2 „ $\frac{1}{15}$.
7. Erysipelas or its congeners prevalent	15	2 „ about $\frac{1}{7}$.
8. Exposure to infectious fevers	9	1 „ $\frac{1}{9}$.
9. Infectious fevers prevalent	27	5 „ between $\frac{1}{6}$ and $\frac{1}{5}$.
10. Injury to or bursting of vesicles	48	10 „ between $\frac{1}{5}$ and $\frac{1}{4}$.
11. Improper management or neglect	50	5 „ $\frac{1}{10}$.
12. Debility or illness of vaccinee	27	3 „ $\frac{1}{9}$.
13. Family unhealthiness or peculiarities	43	4 „ about $\frac{1}{11}$.
14. Vesicles opened on 8th day	46	5 „ „ $\frac{1}{9}$.

Note again the excess *above the average* in Cols. 1, 2, 4 (and 1, 2, 3, and 4 taken together) 10, and the proportion *below* the average in Cols. 3, 5, 6, 8, 11, 12, 13, 14.

Mr. Ballard's Memorandum.

Table showing Combinations of Morbific Circumstances among the Cases of Group I. generally, and among the Cases tabulated under each Column.

The columns marked * relate to the Ulcerative Cases.

——	Total Cases in which these opportunities of Mischief occurred.		Cols. 1, 2, 3, and 4.		Col. 5.		Col. 6.		Col. 7.		Col. 8.		Col. 9.		Col. 10.		Col. 11.		Col. 12.		Col. 13.		Col. 14	
		*		*		*		*		*		*		*		*		*		*		*		*
Whole 150 cases of Group I. - -	150	46	42	15	62	25	30	8	15	4	9	3	27	7	48	15	50	23	27	9	43	17	46	15
Cols. 1, 2, 3, 4. Faults in vaccinifer or vaccinator.	42	15	—		13	8	5	2	5	2	1	0	8	2	15	3	9	5	9	4	8	4	11	6
5. Unwholesome surroundings at home	62	25	13	8	—		12	7	7	3	1	1	11	3	16	7	24	13	13	6	20	10	19	9
6. Exposure to erysipelatous or septic infection.	30	8	5	2	12	7	—		2	0	2	0	4	1	12	3	10	6	6	1	17	6	9	2
7. Erysipelas or its congeners prevalent	15	4	5	2	7	2	2	0	—		1	0	4	1	5	2	5	2	—		1	1	5	2
8. Exposure to infectious fevers - -	9	3	1	0	1	1	2	0	1	0	—		—		3	1	2	1	1	1	1	1	3	1
9. Infectious fevers prevalent - -	27	7	8	2	11	3	4	1	4	1	—		—		7	1	8	6	3	0	6	3	7	4
10. Injury to or bursting of vesicles -	48	15	15	3	16	7	12	3	5	2	3	1	7	1	—		23	11	11	3	17	6	9	3
11. Improper management or neglect -	50	23	9	5	24	13	10	6	5	2	2	1	8	6	23	11	—		10	3	17	12	14	7
12. Delicacy or illness of vaccinee -	27	9	9	4	13	6	6	1	—		1	1	3	0	11	3	10	3	—		13	5	4	1
13. Family unhealthiness or peculiarities	43	17	8	4	20	10	17	6	1	1	1	1	6	3	17	6	17	12	13	5	—		10	2
14. Vesicles opened on 8th day - -	46	15	11	6	19	9	9	2	5	2	3	1	7	4	9	3	14	7	4	1	10	2	—	
[Vesicles *not* opened on 8th day -	59	19	21	7	24	12	11	3	6	1	4	0	9	1	23	6	19	8	15	5	19	9	—]	

The following Table exhibits the Per-centage of Ulcerative Cases noted in the columns of the above Table:—

——	Total Cases.	Cols. 1, 2, 3, and 4.	Col. 5.	Col. 6.	Col. 7.	Col. 8.	Col. 9.	Col. 10.	Col. 11.	Col. 12.	Col. 13.	Col. 14.	Vesicles *not* opened 8th day.
Whole 150 cases of Group I. -	30·1	35·7	40·3	26·6	26·6	33·3	25·9	31·2	46·0	33·3	39·5	32·6	32·2
Cols. 1, 2, 3, 4. Faults in vaccinifer or vaccination.	31·0	—	61·5	40·0	40·0	—	25·0	29·0	55·5	44·4	50·0	54·6	33·3
5. Unwholesome surroundings at home.	40·3	61·5	—	58·3	28·6	—	27·3	43·7	54·2	46·2	50·0	47·4	50·0
6. Exposure to erysipelatous or septic infection.	26·6	40·0	58·3	—	0·0	0·0	25·0	25·0	60·0	16·6	35·3	22·2	27·3
7. Erysipelas or its congener prevalent.	26·6	40·0	28·6	0·0	—	—	25·0	40·0	40·0	—	—	40·0	16·6
8. Exposure to infectious fevers -	33·3	0·0	—	0·0	—	—	—	33·0	50·0	—	—	35·0	0·0
9. Infectious fevers prevalent -	25·9	25·0	27·3	25·0	25·0	—	—	14·3	75·0	0·0	50·0	57·1	11·1
10. Injury to or bursting of vesicles	31·2	20·0	43·7	25·0	40·0	33·0	14·3	—	47·8	27·3	35·3	33·3	26·1
11. Improper management or neglect.	46·0	55·5	54·2	60·0	40·0	50·0	75·0	47·8	—	30·0	70·5	50·0	42·1
12. Delicacy or illness of vaccinee -	33·3	44·4	46·2	16·6	—	—	0·0	27·3	30·0	—	38·5	25·0	33·3
13. Family unhealthiness or peculiarities.	39·5	50·0	50·0	35·3	—	—	50·0	35·3	70·5	38·5	—	20·0	47·4
14. Vesicles opened on 8th day -	32·6	54·6	47·4	22·2	40·0	33·0	57·1	33·3	50·0	25·0	20·0	—	—
[Vesicles *not* opened on 8th day	32·2	33·3	50·0	27·3	16·6	0·0	11·1	26·1	42·1	33·3	47·4	—	—]

In the above tables the following points may be noted as indicating (so far as available figures go) the circumstances which specially promote the occurrences of the ulcerative process at the vaccination spots.

The largest proportion of ulcerative cases was found among those children who had been exposed to various kinds of mismanagement or neglect, among those whose home surroundings were unwholesome, and among the children of families in various ways and degrees unhealthy or peculiar in their morbid tendencies.

This inference is strengthened by noting the proportion of such cases where the children had been exposed to the influence of two or more of the above morbific circumstances in conjunction: *e.g.*—

Where improper management or neglect (Col. 11) was associated with the prevalence of infectious fevers, Col. 8.
" " " " family unhealthiness or morbid peculiarities, Col. 13.
" " " " exposure to erysipelatous or septic infections, Col. 6.
" " " " faults under Cols. 1, 2, 3, and 4.
" " " " unwholesome home surroundings, Col. 5.

Where unwholesome home surroundings (Col. 5) were *further* associated with faults under Cols. 1, 2, 3, and 4.
" " " " injury to or bursting of vesicles, Col. 10.
" " " " exposure to erysipelatous or septic infection, Col. 6.
" " " " delicacy or illness of the vaccinee, Col. 12.
" " " " family unhealthiness or morbid peculiarities, Col. 13.

Where family unhealthiness or morbid peculiarities, Col. 13
" " " were *further* associated with faults under Cols. 1, 2, 3, and 4. *Dr. Ballard's Memorandum.*
" " " " the prevalence of infectious fevers, Col. 9.
Where faults under Cols. 1, 2, 3, and 4 were *further* associated with exposure to erysipelatous or septic infections, Col. 6.
" " " " prevalence of erysipelas or its congeners, Col. 7.
Where prevalence of erysipelas or its congeners (Col. 7) were *further* associated with injury to or bursting of vesicles, Col. 10.

As regards the question whether opening of the vesicles on the 8th day promotes the occurrence of ulceration subsequently it is to be noted that, while on the whole the same proportion of cases became ulcerated when the vesicles had been opened and when they were known *not* to have been opened, and while their proportion closely corresponds with the whole proportion among the 150 cases of Group I., nevertheless, when erysipelas and its congeners were prevalent, when infectious fevers were prevalent, where there had been mismanagement or neglect, and where the vaccinifers or the vaccinator had been in fault, the occurrence of ulceration was more frequent in the children where vesicles were meddled with on the 8th day than in those where they were left alone.

ADDENDUM B.

GROUP I.

Column 1 (*n.* + *only*).

More detailed Statement of Particulars of Cases tabulated in A. (furnished with the object of saving the reader the trouble of referring back to the Primary Tabulation).

WHERE the VACCINIFER, although apparently fit for use on 8th day, nevertheless became ILL subsequently.

—	Vaccinifer.		Vaccinee.		Co-vaccinees and Subsidiary Co-vaccinees.	Associated Morbific Circumstances as recorded in Columns
	Date of commencing Illness.	Nature of Illness.	Date of commencing Illness.	Nature of Illness.		
1st Week Cases—						
xviii. - -	Sometime after inspection.	Eczema - -	3rd and 4th day broken vesicles, 8th day much inflamed.	Erysipelas -	(+)	8, 10, 11.
cxviii. -	9th day, *i.e.*, same day as cxviii.	Erysipelas -	1st day red, 3rd pocks broken, 5th erysipelas.	Erysipelas -	+ (+)	3, 5, 9, 10. Vaccinifer and vaccinee possibly infected same day.
civ. - -	Same day as civ.	Erysipelas -	8th day - -	Erysipelas commencing near the eye.	n	3, 5, 13. Vaccinifer and vaccinee possibly infected same day.
2nd Week Cases—						
*clii. - -	27th day - -	Died of meningitis.	2nd week - -	Inflammation; ulceration.		5, 6, 11.
cxxiii. -	After 8th day -	Inflamed from shoulder to elbow.	10th day -	Erysipelas commencing on shoulder.	+	5, 11, 14.
3rd Week Cases—						
clxxxii. -	3 months after use.	Died of bronchitis.	3rd week - -	Erysipelas -	n	5, 9, 14.(?)
*lx. - -	12th day, *i.e.*, 4 days after use.	Ulceration like lx. Illegitimate. Mother had mammary abscess.	15th day -	One large bulla which sloughed.	+	2, 4, 6, 10.

Column 2.—*Where* ***Vaccinifer*** *was unfit for Use on 8th day.*

—	Vaccinifer.		Vaccinee.	Co-vaccinees and Subsidiary Co-vaccinees.	Associated Morbific Circumstances as recorded in Columns
	Reason of Unfitness.	Date of commencing Illness.	Nature of Illness.		
1st Week Cases—					
lxxxiii. -	Ill during 1st week, incubating erysipelas.(?)	4th day inflamed -	Erysipelas - -	+	1, 3, 4.
lxii. - -	Excessive areola -	2nd day red, then inflamed.	Erysipelas - -	o (+)	1, 4, 5, 7, 10.
lxxviii. -	Burst vesicles on 8th day.	1st week - -	Pyæmia - -	+ (+)	1, 9, 10.
lxxix. - -	Burst vesicles on 8th day.	1st week - - -	Pyæmia - -	+ (+)	1, 9, 10.

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Column 2—continued.

	Vaccinifer.		Vaccinee.	Co-vaccinees and Subsidiary Co-vaccinees.	Associated Morbific Circumstances as recorded in Columns
	Reason of Unfitness.	Date of commencing Illness.	Nature of Illness.		
1st Week Cases—*cont.*					
cvii. -	Inflamed arm with almost certainty.	5th day pocks burst and inflamed.	Erysipelas - -	(+)	1, 4, 10.
cvii.a - -	Inflamed arm with almost certainty.	3rd and 4th day pocks burst and inflamed.	Erysipelas - -	(+)	1, 4, 10.
cxvi. -	Redness commencing about pocks in 1st week.	About 2nd day -	Erysipelas, recurring after healing of spots.	n	1, 7, 9, 14.
2nd Week Cases—					
xxii. - -	Vesicles broken when used.	11th day - - -	Cellulitis - - -	o	1, 10 11.
*xxix. -	Suffering from impetigo.	9th day inflamed -	Erysipelas, ulceration, and sloughing.	n	5, 8, 10, 11, 12, 13.
*cxxxii. -	Tabes mesenterica -	2nd week - -	Cellular inflammation; sloughing sore.	n	5, 12, 13.
cxx. -	Burst vesicles, subsequently axillary abscess.	8th day vesicles broken, 10th axillary abscess, erysipelas.	Axillary abscess, erysipelas.	+ (+)	1, 4, 6, 10.
*cciv. - -	Vaccinifer puny, although pocks normal.	End of 2nd week -	Ulceration - -	n	5, 10, 11.
3rd Week Cases—					
*clvi. -	Very filthy child and mother.	Sores after opening vesicles, 9th week erysipelas.	Opened vesicles form sores, erysipelas began near ear.	n	6(?), 7, 14.
*lx. - -	Illegitimate. Mother had mammary abscess.	15th day - - -	One large bulla which sloughed.	+	1, 6, 10.
*cxxix. -	From an unhealthy family.	By 4th week -	Ulcers (which healed)	n	5, 12, 13.
cxciv. - -	Undue areola - -	3rd week - -	General crop of blebs commencing near pocks.	n	13.

Column 3.—Where the Operator was personally Infective, with more or less probability.

	Operator.	Vaccinee.		Co-vaccinees and Subsidiary Co-vaccinees.	Associated Morbific Circumstances as recorded in Columns
	Ground of Suspicion or Belief.	Date of commencing Illness.	Nature of Illness.		
1st Week Cases—					
lxxxiii. -	Recent close attendance on bad septic case, and personal resultant phlegmon, &c.	4th day, inflamed -	Erysipelas - -	+	1, 2, 4.
lxxxv. - - (The vaccinifer of lxxxiii.)	Recent close attendance on bad septic case, and personal resultant phlegmon, &c.	1st week ill (? sickening for erysipelas).	Erysipelas (2nd week).	+	If not sickening for erysipelas in 1st week, infection may have been received on 8th day when used as a vaccinifer.
cxviii. - -	Day before gave first attendance on very bad case of erysipelas.	1st day, red. 3rd, pocks broken. 5th, erysipelas.	Erysipelas - -	+ (+)	1, 5, 9, 10. Vaccinifer and vaccinee possibly infected same day.
civ. - -	Vaccinator attending case of idiopathic erysipelas in neighbouring street.	8th day (at inspection).	Erysipelas, commencing near eye.	n	1, 5, 13. Vaccinifer and vaccinee possibly infected same day.
*cviii. - -	Attending bad cases of erysipelas and just come from a bad case.	6th day, inflamed. 9th, broken pocks.	Erysipelas, ulceration.	+	
*clxxxix. -	Visited case of erysipelas on vaccination day and day before.	8th day, commencing erysipelas.	Erysipelas; 2nd week, burst pocks and sores.	+	5, 7.

Column 3—continued.

	Operator.	Vaccinee.		Co-vaccinees and Subsidiary Co-vaccinees.	Associated Morbific Circumstances as recorded in Columns
	Ground of Suspicion or Belief.	Date of commencing Illness.	Nature of Illness.		
2nd Week Cases—					
*lxxxiv. -	Same as lxxxiii. and lxxxv. *supra*.	9th day, inflamed; then erysipelas.	Erysipelas and ulceration.	+	14. Probably infected on day of inspection, when used as vaccinifer.
cxxxiv. -	Attending case of erysipelas at next house.	11th day - -	Erysipelas - -		6. Child taken into next house during vaccinia.
x i	Had been visiting case of erysipelas, and subsequently had other cases under his care.	9th day - -	Erysipelas - -	n	4, 6, 10, 12.

Column 4.—Faults of Vaccinator other than those connected with circumstances included in Cols. 2, 3. 7, 8, 9, 12, *or* 13.

Cases.	Faults of Operator.	Vaccinee.		Co-vaccinees and Subsidiary Co-vaccinees.	Associated Morbific Circumstances as recorded in Columns
		Date of commencing Illness.	Nature of Illness.		
1st Week Cases—					
xl. - -	Unqualified. Repeated use of old "points."	7th day - - -	Erysipelas and abscess.		5, 11, 12, 13.
lxii. - -	Habitual use of areolated arms -	2nd day, redness -	Erysipelas - -	o (+)	1, 2, 5, 7, 10.
lxv. - -	Apt to disregard regulations -	8th day - - -	Erysipelas, commencing in forearm.	(+)	
xxxi. - -	Apt to disregard regulations. (Same operator.)	By 8th day - -	Erysipelas, commencing in forearm.	(+)	
*xxxv. -	Rough vaccination with amputating knife.	5th day, redness -	Erysipelas, ulceration.	(+)	9, 11.
lxxxiii. -	Moistening points by breathing on them.	4th day, inflamed -	Erysipelas - -	(+)	1, 2, 3.
*xciv. - -	Negligent in cleansing instrument.	3rd day, illness; 5th, redness.	Erysipelas, ulceration, abscess.	o (+)	8?, 13.
*c. - -	Mentally deranged and reckless	2nd day - - -	Erysipelas, ulceration, abscess.	(+)	12.
ci. - -	Mentally deranged and reckless	By 8th day (ill previously).	Extensive erysipelas, commencing shoulder and back.	(+)	10, 14.
cvii. - -	Instrument used for other purposes.	5th day, inflamed and burst.	Erysipelas - -	(+)	1, 2, 10.
cvii.a -	Instrument used for other purposes.	3rd or 4th day, inflamed and burst.	Erysipelas - -	(+)	1, 2, 10.
*cxvii.- -	Habitual use of areolated arms -	7th day, inflamed; 8th, extended.	Erysipelas - -	+ (+)	5, 9, 14.
cxcvii.- -	Unqualified - - - - -	By 8th day - -	Erysipelas - -		7, 11.
2nd Week Cases—					
xxxiv.- -	Habitual non-observance of precautions.	13th day - - -	Erysipelas - -		14.
cxx. - -	Careless selection of vaccinifers -	10th day, axillary abscess, then erysipelas.	Abscess and erysipelas.	+ (+)	1, 2 6, 10.
*clxvi.- -	Operating instrument found filthy.	9th day - - -	Inflammation, sloughing ulcers.		5, 11, 14.
clxxiv.- -	Points carelessly kept - -	9th day - - -	Erysipelas - -	n	3, 6, 10, 12.
clxxxv. -	Instrument used for other purposes.	A week after vaccination.	Erysipelas - -	n	9.
3rd Week Cases—					
clxvii. - -	Lymph blown out of tube on to thumb nail.	15th day - - -	Erysipelas - -	n	9, 10, 12.
*clxxiii.	Habitual use of areolated arms -	3rd week - -	Erysipelas, sloughing sores.	? (+)	5, 11.
clxix. - -	Crusts picked off by unqualified assistant.	3rd week - -	Erysipelas - -	n	8, 10.
*lx. - -	Vaccinifer illegitimate -	15th day - - -	Large bulla, which sloughed.	+	1, 2, 6, 10.
Uncertain Commencement—					
cliv. - -	Careless selection of vaccinifers-	Uncertain - -	Inflamed and burst vesicles.	(+)	12, 13.
clxxix. -	Habitual use of unfit arms -	After 3rd week -	Erysipelas - -	n (+)	5, 12

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Column 5.—Unwholesome Local Conditions.

Cases.	Nature of Unwholesomeness.	Vaccinee.		Co-vaccinees and Subsidiary Co-vaccinees.	Associated Morbific Circumstances as recorded in Columns
		Date of commencing Illness.	Nature of Illness.		
1st Week Cases—					
xv.	At home. Dwelling extremely filthy.	7th day, inflamed; 8th, erysipelas.	Erysipelas	n	13.
xvii.	Home surroundings eminently bad.	4th day, redness; by 10th, extensive erysipelas.	Erysipelas	n	6, 13.
xl.	Dirty home in poor locality	7th day, much inflamed.	Erysipelas, and abscess		4, 11, 12, 13.
lxii.	Bad drainage and offensive nuisances.	2nd day, commencing areola, then inflamed.	Erysipelas	o (+)	1, 2, 4, 7, 10.
*xxvii.	Want of cleanliness. No proper water supply.	7th day, inflamed and lymph opaque.	Erysipelas, ulceration	(+)	6, 11, 13.
xxxiii.	Filthy home	By 8th day, vesicles dark colour and excessive areola.	Erysipelas	n	6, 7.
cxviii.	Sanitary condition of place very unsatisfactory.	1st day, red; 3rd day, pocks broken; 5th, erysipelas.	Erysipelas	+ (+)	1, 3, 9, 10.
*cxvii.	Overcrowding in filthy comfortless room.	7th day, inflamed	Erysipelas, ulceration	+ (+)	4, 9, 14.
civ.	Offensive, overflowing midden privies about.	8th day	Erysipelas, commencing near eyes.	n	1, 3, 13.
cxxxix	Home very dirty and offensive	8th day, pocks broken and inflamed.	Erysipelas, axillary abscess.	n	10, 13.
cliii.	Home an exceedingly dirty hovel	8th day, pocks broken and coalesced; inflammation.	Cellulitis	o	10, 11.
*clxxxvii.	Home dark, dirty, and ill-ventilated.	6th day, red; 8th, inflamed and extending.	Erysipelas, ulceration	n	8, 14.
*clxxxix	Unwholesome surroundings at home, which was an inn; child much in filthy tap room.	8th day	Erysipelas, sores	+	3, 7.
excviii.	Father a journeyman size maker, and so liable to personal putrid pollutions.	8th day	Erysipelas		7, 9.
2nd Week Cases—					
*xxix.	Dirty home	9th day, inflammation	Erysipelas, ulceration, and sloughing.	n	2, 6, 10, 11, 12, 13.
xxx.	Bad drainage and privy accommodation.	10th day, inflammation.	Erysipelas	n	9.
xxxii.	Home damp, ill-ventilated cottage, defective drainage, &c.	2nd week or later	Erysipelas	n	6, 9.
lxviii.	Defective drainage	8th day, vesicles broken; 2nd week, erysipelas.	Erysipelas		6, 10, 12, 13.
*lxx.	Dirty home and family. Offensive knacker's yard.	2nd week, multiple abscess.	Multiple abscesses, pocks ulcerated.		14.
*lxxx.	Dirty, slatternly mother, and home with unwholesome surroundings.	Early in 2nd week	Erysipelas and ulceration.	n	6, 11, 13, 14.
*cxxxii.	Squalid home, dirty	2nd week	Cellular inflammation, sloughing sores.	n	2, 12, 13.
cxiii.	Drain gully just in front of house.	9th or 10th day	Erysipelas	n	10, 11.
cxiv.	Very filthy unwholesome surroundings of home.	9th day	Erysipelas	n	14.
cxxxvi.	Drain and cesspool faults	9th day	Erysipelas	n	9, 13.
cxxiii.	Unwholesome surroundings of home and food.	10th day	Erysipelas, commencing on shoulder.	+	1, 11, 14.
cxxii.	Privy middens in too close proximity.	10th day	Erysipelas		11.
cxlv.	Home and surroundings dirty and unwholesome.	2nd week, inflammation.	Erysipelas	n	11, 12.
cli.	Great prevalence of ashpit nuisances close by.	2nd week	Erysipelas, commencing in forearm.	n	7, 9, 10.
*clii.	Home a dirty unventilated room in tenement house.	2nd week	Inflammation, ulceration.		1, 6, 11.
*clxvi.	Home very dirty	9th day, swelling	Erysipelas, sloughing, ulcers, &c.		4, 11, 14.
clxxviii.	Home and mother unclean	11th day	Erysipelas	n	9, 12.
clxxx.	Serious nuisances outside dwelling	9th day	Erysipelas	n	
clxviii.	Home in low, confined yard with nuisances.	9th day	Erysipelas	n	7, 14.
*cxc.	Home miserable and filthy	1st week (?), axillary abscess; 2nd week, inflammation, &c.	Erysipelas and ulceration.		7, 9, 10, 11, 14.

Column 5—continued.

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Cases.	Nature of Unwholesomeness.	Vaccinee.		Co-vaccinees and Subsidiary Co-vaccinees.	Associated Morbific Circumstances as recorded in Columns
		Date of commencing Illness.	Nature of Illness.		
2nd & Week Cases—*cont.*					
cxci. - -	Filthy cesspool abutting on house.	10th day - -	Erysipelas - -	+	11, 14.
*xix. -	Home unwholesome surroundings with putrid emanations.	11th day - -	Deep sloughing ulcer from coalescence.	n	14.
*cxlviii.	Dirty home - - -	2nd week - -	Pocks formed one deep sore.	n	6, 13.
*cxciii. -	Dirty mother and unwholesome lodgings.	9th day - -	Intermediate vesicles; coalescence, and ulcer.	n	10, 11.
cxcv. - -	Dilapidated, damp, stuffy cottage in a court with w.c. nuisances.	10th day. 11th day, a convulsion.	Erysipelas - -	n	13
*cci. -	Home dirty and ill-ventilated, in a condemned court.	2nd week, after injury to pocks.	Ulceration of ⅔ injured pocks.	n	10, 12
*ccii. - -	Home dirty with privy nuisance and possibly tainted water supply.	2nd week - -	Erysipelas, sloughing sores, and axillary abscess.		6, 9, 11, 13, 14.
*cciv. -	Filthy crowded house with bad ventilation and excremental and other nuisances.	End of 2nd week -	Ulceration and abcesses.	n	2, 10, 11.
3rd Week Cases—					
*xlii. - -	Home surroundings filthy and bad drainage.	21st day - -	Sloughing, ulcers, and erythema	o	13.
lxxxviii. -	Home and mother dirty - -	2nd week, broken pocks; 3rd week, erysipelas.	Erysipelas - -	n	10, 11, 14.
xci. - -	Home and mother dirty - -	19th day - -	Erysipelas and multiple abscesses.	— n	6, 11, 13, 14.
xcii. -	Home dirty and overcrowded -	16th day - -	Erysipelas - -		12.
*cv. - -	Drain air entering house. Other insanitary conditions.	3rd week - -	Erysipelas, sores -		11, 12, 13.
cxxxvii. -	Home back to back. Drain air enters house.	16th day, crusts fell -	Erysipelas - -	n	
cxlix. -	Home unwholesome. Mother dirty, &c.	3rd or 4th week -	Erysipelas - -	n	11, 14.
*clxiv. -	Home fairly clean, but mother dirty, &c.	3rd week, axillary abscess.	Erysipelas and sloughing.	n	10, 11, 14.
clxxxii. -	Home surrounded with filth and nuisances.	3rd week, pocks healed but inflammation.	Erysipelas - -		1, 9.
*clxxiii. -	Home overcrowded - -	3rd week, (late development).	Erysipelas, sloughing sores.	? (+)	4, 11.
*cxxix. -	Offensive nuisances at rear of house.	By 4th week -	Ulcers which healed by 11th week.	n	2, 12, 13.
4th Week Cases—					
*lii. - -	Squalid home, foul domestic surroundings.	4th week - -	Ulceration - -	n	6, 10, 11, 13.
xxxix. -	Kept all day by slatternly old woman in a filthy house.	21st day, scabs rubbed off.	Erysipelas - -	n	10, 11.
lxvii. - -	Home dirty with unwholesome surroundings.	4th week (pocks healed).	Erysipelas, commenced at elbow.	n	14.
5th Week or Later Cases—					
xliii. -	Defective drainage - -	2 weeks after healing	Erysipelas (vaccinated arm).	n	14.
cxxiv. - -	Home unwholesome above average.	31st day (scabs fallen)	Erysipelas (commencing just below vaccinated places).	n	14.
*clxxvi. -	Home surroundings calculated to promote illness.	By 31st day coalescence.	Erysipelas and sloughing.	o	12.
Uncertain—					
cliv. - -	Home one dirty room of unventilated house.	Burst pocks, inflammation.	Inflamed arm -	(+)	4, 12, 13.
clxxix. -	Dirty, untidy home with offensive privy nuisance.	After expiration of 3 weeks.	Erysipelas - -	n (+)	4, 12.
*cx. - -	(When vaccinated and up to 6 weeks before death) home surrounded by insanitary conditions.	Uncertain - -	Ulcerated surface left on detachment of crusts, then blebs.		

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Column 6.—Instances where Child was exposed to apparent opportunity of direct Erysipelatous or Septic Infection.

Cases.	Occasion, &c. of Exposure.			Vaccinee.		Co-vaccinees and Subsidiary Co-vaccinees.	Associated Morbific Circumstances as recorded in Columns
	When.	Where.	Nature of Exposure.	Date of commencing Illness.	Nature of Illness.		
1st Week Cases—							
lxix.	Vaccination day.	Vaccination room.	Crowded offensive private dispensary, patients with suppurating sores.	4th day	Erysipelas commencing on *opposite* arm.		
*xxvii.	Constantly	At home	A child in family had discharging sinusses from hip joint disease.	7th day, inflamed, and lymph opaque.	Erysipelas, ulceration.	(+)	5, 11, 13.
xxiv.	Constantly	At home	Mother frequently had erysipelas when getting a "cold" which she had at time of vaccination. Another child recently had erysipelas.	By 8th day broken vesicles and inflammation.	Erysipelas	n	10, 13.
xxxiii.	Constantly	At home	Erysipelas recently in house. Child used filthy couch and pillow used by sister when ill with erysipelas.	By 8th day vesicles dark coloured and with excessive areola.	Erysipelas	n	5, 7.
cxli. } cxlii. }	Constantly	A ward of W.H.	Furnished with bedding from a ward previously occupied by a case of erysipelas.	cxli. 3rd day. cxlii. 6th day.	Erysipelas	{ + / +	8. / 8.
ci.	Constantly	At home	Mother at time of child's vaccination and before had inflammatory sore throat.	6th day, broken pocks; 8th day, inflamed.	Erysipelas	n	9, 10, 13, 14.
clxxv.	Constantly	At home	Father sore throat. Abscess burst day before child's illness.	By 7th day	Erysipelas	n	13.
xvii.	When recently vaccinated.	At home	Child vaccinated just as a series of cases of communicable sore throats in family was coming to an end.	4th day, redness; by 10th extensive erysipelas.	Erysipelas	n	5, 13.
2nd Week Cases—							
*xxix.	Constantly	At home	Mother ulcerated legs	9th day, inflammation.	Erysipelas, ulceration, and sloughing.	n	2, 5, 10, 11, 12, 13.
xxxii.	Constantly	At home	Mother attending same time to another child with compound fracture.	2nd week or later.	Erysipelas	n	5, 9.
xxxviii.	Constantly	At home	Mother had purulent discharge from ear.	9th day, inflammation.	Erysipelas	n	10, 12, 13, 14.
lxiii.	Constantly	At home	Child had vulvitis. Mother just previously septic uterine discharge.	2nd week	Inflammation which spread.	n	10, 11, 12, 13, 14.
lxviii.	Constantly	At home	Mother with suppuratory sore. (Father had thecal abscess 6 mos. later.)	8th day, broken vesicles; 2nd week, erysipelas.	Erysipelas	o	5, 10, 12, 13.
*lxxx.	Constantly	At home	Dirty mother with discharging sore on ear.	Early in 2nd week.	Erysipelas and ulceration.	n	5, 11, 13, 14.
cxx.	Vaccination and inspection days.	P. V's. Surgery.	Open to septic infections.	8th day, broken vesicles; 10th, axillary abscess.	Erysipelas	+ (+)	1, 2, 4, 10.
cxxxiv.	Sometime during vaccinia.	Next door	Child occasionally taken to this house where case of erysipelas.	11th day	Erysipelas		3.
cxxviii.	Day before attack.	Visit to grandmother.	Grandmother had chronic ulcer on leg with occasional erysipelas.	12th day	Erysipelas commencing *anterior fold of axilla.*	+	14.
*clii.	Constantly	At home	Children (probably playfellows) in next room had abscesses in neck.	2nd week	Inflammation, ulceration.		1, 5, 11.
clix	Constantly	At home	Mother discharging abscess in ear.	Evening of 9th day.	Erysipelas	n	13, 14.
clxxiv.	On inspection day.	Waiting room of a hospital.	Many patients, variety of surgical cases, ulcers, tonsillitis, otitis, abscesses, &c.	9th day	Erysipelas	n	3, 4, 10, 12.
*cxlviii.	Constantly	At home	Mother with cracked nipples and erysipelas.	2nd week	Pocks broke and formed one deep sore.	n	5, 13.

Dr. Ballard's Memorandum.

Column 6—continued.

Cases.	Occasion, &c. of Exposure.			Vaccinee.		Co-vaccinees and Subsidiary Co-vaccinees.	Associated Morbific Circumstances as recorded in Columns
	When.	Where.	Nature of Exposure.	Date of commencing Illness.	Nature of Illness.		
2nd Week Cases—*cont.*							
*cciii. -	From 6th day	At home -	Mother sore throat and erysipelas.	Course of 2nd week.	Erysipelas and sloughing sores.	n	5, 9, 11, 13, 14.
3rd Week Cases—							
xxi. -	During vaccination frequently.	At grandmother's house.	Grandmother suffering from erysipelas.	18th day, scabs rubbed off and bleeding followed on 20th day by erysipelas.	Erysipelas -	n	7, 10, 11.
lxiv. -	Constantly -	At home -	Slept in same bed as father with sore leg and mother with sore throat.	19th day, bronchitis, and erysipelas.	Erysipelas *commencing at shoulder.*	n	13.
xci. -	Constantly -	At home -	Dirty mother with several discharging abscesses in breast.	19th day -	Erysipelas and multiple abscesses.		5, 11, 13, 14.
xcviii. -	Constantly -	At home -	Mother suckled child from breast with mammary abscess.	By 18th day -	Erysipelas -		13, 14.
cxliii. -	Constantly -	At home -	Erysipelas in house 10 months before.	16th day -	Erysipelas began *about a nævus*: the vaccinated spots unaffected.		9, 11, 12.
*lx. -	On vaccination day.	At station -	Mother of illegitimate vaccinifer had mammary abscess.	15th day -	One large bulla formed which sloughed.	+	1, 2, 4, 10.
4th Week Case—							
*lii. -	Constantly -	At home -	Mother purulent discharge from eyes.	4th week -	Ulceration -	n	5, 10, 11, 13.

Column 7.—Instances where Erysipelas or its Congeners were Prevalent in the Neighbourhood.

—	Circumstances of Prevalence.	Vaccinee.		Co-vaccinees and Subsidiary Co-vaccinees.	Associated Morbific Circumstances as recorded in Columns
		Date of commencing Illness.	Nature of Illness.		
1st Week Cases—					
lxii. -	Boils, abscesses, and fever from bad drainage.	2nd day, commencing areola then inflamed.	Erysipelas - -	o (+)	1, 2, 4, 5, 10.
xxxiii. -	Erysipelas recently in house and neighbourhood.	By 8th day vesicles dark and excessive areola.	Erysipelas - -	n	5, 6.
cxvi. -	Erysipelas and scarlatina prevalent in neighbourhood.	2nd day, red; 8th day extensive erysipelas.	Erysipelas - -	n	1, 2, 9, 14.
*clv. - -	Prevalence of erysipelas.	1st week, pock broke; 7th day, inflamed.	Erysipelas, ulceration.	(+)	10, 11, 13.
*clxxxix. -	Prevalence of erysipelas.	8th day, commencing erysipelas.	Erysipelas, sores -	+	3, 5.
excvii. -	Prevalence of erysipelas.	8th day, much inflamed.	Erysipelas - -		4, 11.
excviii. -	Prevalence of erysipelas.	8th day, much inflamed.	Erysipelas -		5, 9.
2nd Week Cases—					
cli. - -	Erysipelas and scarlatina prevalent in neighbourhood.	2nd week - -	Erysipelas not commencing about pocks, but *in forearm.*	n	5, 9, 10.
clxviii. -	Erysipelas very prevalent.	9th day, redness below pocks.	Erysipelas - -	n	5, 14.
*exc. - -	Erysipelas and scarlatina prevalent.	1st week (?), axillary abscess; 2nd week, inflammation, ulceration.	Erysipelas and ulceration.		5, 9, 10, 11.
excix. - -	Erysipelas prevalenc -	End of 2nd week -	Erysipelas - -		11.

Dr. Ballard's Memorandum.

Column 7—continued.

—	Circumstances of Prevaalence.	Vaccinee.		Co-vaccinees and Subsidiary Co-vaccinees.	Associated Morbific Circumstances as recorded in Columns
		Date of commencing Illness.	Nature of Illness.		
3rd Week Cases—					
xxi. - -	Erysipelas and puerperal septicæmia in neighbourhood.	18th day, scabs rubbed off.	Erysipelas - -	n	6, 10, 11.
*clvi. - -	Erysipelas prevalent -	9th week, near ear (opened vesicles having previously formed sores).	Erysipelas, sores -	n	2, 14.
cc. - -	Erysipelas prevalent	About 15th day -	Erysipelas - -	n	8, 14.
4th Week Case—					
lxxxvii.	Persons ill with erysipelas in neighbourhood, one close to cla.d's home.	Pocks healed. 25th and 26th day, erysipelas.	Erysipelas - -	n	

Column 8.—Exposure to Infectious Fevers.

—	Exposure.			Vaccinee.		Co-vaccinees and Subsidiary Co-vaccinees.	Associated Morbific Circumstances as recorded in Columns
	When.	Where.	To what.	Date of commencement of Illness.	Nature of Illness.		
1st Week Cases—							
xviii. -	Day of vaccination.	At station -	Measles -	3rd or 4th day, burst vesicles; 8th day, inflamed.	Erysipelas -	(+)	1, 10, 11.
[xciv. - -	Day of vaccination.	At station -	Enteric fever.*	3rd day, ill; 5th day, redness.	Erysipelas, ulceration, abscess.	(+)	4, 13.] Woman* just recovered from typhoid present.
*clxxxviii. -	Frequently after vaccination.	Friend's house-	Measles -	6th day, red; 8th day, spread.	Erysipelas and ulceration.	n	5, 14
cxli. -	At and after vaccination.	In institution (W.H.).	Measles -	3rd day -	Erysipelas -	+	6.
cxlii. - -	At and after vaccination.	In institution (W.H.).	Measles -	6th day - -	Erysipelas	+	6.
2nd Week Case—							
clxxvii. -	Any time -	Free inter-communication with neighbouring cottages with scarlatina in them.	Scarlatina -	10th day, commenced.	Erysipelas -	n	14.
3rd Week Case—							
clxix. -	8th day -	At station -	Measles -	19th day, scabs pulled off and then erysipelas.	Erysipelas -	n	4, 10.
cc. (?) -	Throughout	At home -	Suspicion of diphtheria.	About 15th day commenced.	Erysipelas -	n	7, 14. Mother had suspected diphtheria just before child's vaccination.
*lxxvii. -	Throughout	At institutsor -	Measles -	3rd week -	Sloughing, ulceration (measles).	+	
*cxevi. - -	During vaccinia.	At home -	Measles -	3rd week, pock burst and sores formed.	Ulceration (measles).		10, 11, 12 13.

Column 9.—Prevalence of Infectious Fevers, &c.

Dr. Ballard's Memorandum.

Cases.	Nature of Prevalent Illness.	Vaccinee.		Co-vaccinees and Subsidiary Co-vaccinees.	Associated Morbific Circumstances as recorded in Columns
		Date of commencing Illness.	Nature of Illness.		
1st Week Cases—					
*xxxv. -	Scarlatina - -	6th day, red; 8th inflamed.	Erysipelas and ulceration.	(+)	4, 11, 14
lxxviii. -	Scarlatina - - -	1st week - -	"Pyæmia" - -	+ (×) † footnote.	1, 2, 10.
lxxix. -	Scarlatina - -	1st week - - -	"Pyæmia" - -	+ (+) † footnote.	1, 2, 10.
lxxi. -	Measles (and 2 cases previously in house).	By 8th day excessive areola.	Erysipelas, abscess -	n	
cxviii. -	Much enteric fever -	1st day, red; 3rd, pock burst; 5th, erysipelas.	Erysipelas - -	+ (+)	1, 3, 5, 10.
cxvi. -	Scarlatina and erysipelas.	2nd day, red; 8th day, extensive; later, erysipelas.	Erysipelas - -	n	1, 2, 7, 14.
*cxvii. -	Scarlatina - -	7th day, inflamed -	Erysipelas, ulceration	+ (+)	4, 5, 14.
cl. -	Diphtheria - - -	6th day, burst pocks; 8th day, inflammation.	Erysipelas - -	n	6, 10. 1 14.
cxcviii. -	Diphtheria - -	8th day, inflamed and swollen.	Erysipelas - -		5, 7.
2nd Week Cases—					
xxx. -	Scarlatina - -	10th day, inflammation commenced.	Erysipelas - -	n	5.
xxxii. -	Mumps next door -	2nd week or later -	Erysipelas -	n	5, 6.
liv. -	Measles and varicella -	9th day, red; 13th, coalescence.	Inflammation and coalescence, and apparently chicken pox.		
cxxxvi. -	Diphtheria and sore throats in house.	9th day, commenced -	Erysipelas - -	n	5, 13.
cxxv. -	Measles and scarlatina	11th or 12th day, inflammation; then multiple abscesses.	Inflammation and multiple abscesses.	+	
*cxxxi. -	Enteric fever - -	2nd week, blisters -	Erysipelas, ulceration	n	11, 13.
cxliv. -	Measles - -	10th day, commenced -	Erysipelas - -	o	13 14.
cli. -	Scarlatina and erysipelas	2nd week - -	Erysipelas - -	n	5, 7, 10.
clxxviii.	Scarlatina - - -	11th day, commenced -	Erysipelas - -	n	5, 12.
clxxxv. -	Scarlatina - -	One week after vaccination.	Erysipelas - -	n	4.
*cxc. -	Scarlatina and erysipelas	1st week, axillary abscess; 2nd week, inflammation and ulceration.	Inflammation and ulceration.		5, 7, 10, 11, 14.
*ccii. -	Scarlatina - -	2nd week - -	Erysipelas, sloughing ulceration, axillary abscess.	n	5, 6, 11, 13, 14.
3rd Week Cases—					
cexliii. -	Scarlatina (erysipelas in house 10 months before).	16th day, began about a nævus.	Erysipelas, abscess -		6, 11, 12.
clxvii. -	Scarlatina - - -	15th day - -	Erysipelas - -	n	4, 10, 12.
clxxxii. -	Scarlatina and whooping cough - -	3rd week - -	Erysipelas - -	n	1, 5, 14 (?).
*iii. -	Scarlatin and diphtheria.	3rd week on fall of scabs.	Ulceration, scarlatina	+	11, 13.
4th Week Case—					
*xx. -	Diphtheria - -	4th week, commenced at shoulder.	Erysipelas, ulceration of spots.		11.
5th Week Case—					
cxv. -	Scarlatina - -	36th day, an unhealed sore.	Erysipelas - -	n	11.

† The relation of abnormality of vaccinia to scarlatina prevalence is most instructively shown in Dr. Low's report on lxxviii. and lxxix., and in his account of the occurrence of five cases out of 25, made subject of *complaint by Guardians of Horncastle Union*. They show how severe inflammation, broken vesicles in 1st week, and axillary abscess or pyæmia may be *the only* representatives of the result of scarlatina contagion or prevalence.

Dr. Ballard's Memorandum.

Column 10.—Injuries of Vesicles (other than intentional opening of them on 8th day) or bursting of them.

Cases.	Date of Injury.	How effected.	Vaccinee.		Co-vaccinees and Subsidiary Co-vaccinees	Associated Morbific Circumstances as recorded in Columns
			Date of commencing Illness.	Nature of Illness.		
1st Week Cases—						
xviii.	3rd or 4th day.	Unknown, perhaps from tenderness.	8th day, much inflamed.	Erysipelas	(+)	1, 8, 11.
ci.	In first week (?)	Unknown, perhaps from tenderness.	Before 8th day	Erysipelas	(+)	10, 14.
lxii.	6th day	Unknown, perhaps from tenderness.	1st week, inflamed	Erysipelas	o (+)	1, 2, 4, 5, 7.
lxxviii.	In first week	Unknown, perhaps from tenderness.	1st week	Pyæmia	(+)	1, 2, 9.
lxxix.	In first week	Unknown, perhaps from tenderness.	1st week	Pyæmia	+ (+)	1, 2, 9.
xxiv.	In first week	Unknown, perhaps from tenderness.	By 8th day, inflammation.	Erysipelas	n	6, 13.
cxviii.	3rd day	Probably from tenderness.	1st day	Erysipelas	+ (+)	1, 3, 5, 9.
cvii.	5th day	Probably from tenderness.	5th day, inflamed	Erysipelas	(+)	1, 2, 4.
cvii.a	3rd or 4th day.	Probably from tenderness.	3rd or 4th day, inflamed.	Erysipelas	(+)	1, 2, 4.
cl.	6th day	Unknown, perhaps from tenderness.	8th day, inflamed	Erysipelas	n	6, 9, 13, 14.
cxxxix.	In first week	Unknown, perhaps from tenderness.	8th day, excessive areola.	Erysipelas and axillary abscess.	n	5, 13.
cliii.	In first week	Attributed to careless nursing.	8th day, inflamed	Cellulitis	o	5, 11.
*clv.	Early in first week.	Probably from tenderness.	7th day, inflamed	Erysipelas, ulceration	(+)	7, 11, 13.
xii.	6th day	Sleeve of night gown stuck to pock.	By 8th day	Redness, blebs, &c.	n	11, 12, 13.
lxxv.	By 7th day	Probably from tenderness.	7th day	Erysipelas	n	6, 13.
clxxii.	By 7th day	Probably from tenderness.	5th day	Erysipelas	+	
2nd Week Cases—						
xxii.	7th day	Pocks injured by rubbing.	11th day	Cellutitis	o	1, 2, 11.
*xxv.	11th day	Vesicles torn by adherent rag, &c.	In 2nd week, after rough usage.	Erysipelas, sloughing sores.	n	11, 13.
*xxix.	9th day	Pocks broke spontaneously.	9th day, inflamed	Erysipelas, ulceration, and sloughing.	n	2, 5, 6, 11, 12, 13.
xxxviii.	8th day	Vesicles torn by dress adherent to pricked vesicles.	9th day, inflammation	Erysipelas	n	6, 12, 13, 14.
lviii.	6th day	Apparently spontaneously.	13th day, bleb near pocks and between them.	Severe inflammation and more vesicles on face.	n	13.
lxviii.	8th day	Mechanical injury	2nd week	Erysipelas	o	5, 6, 12, 13.
cxi.	By 8th day	Unknown, perhaps from tenderness.	10th day	Inflammation, eruption of blebs.	+	12, 13.
cxx.	8th day	Perhaps rubbed, but ?	10th day	Axillary abscess, erysipelas.	+ (+)	1, 2, 4, 6.
cxiii.	By 8th day	By rubbing	9th or 10th day, inflamed.	Erysipelas	n	5, 11.
cli.	By 8th day	Probably mechanical injury.	2nd week	Erysipelas commenced on forearm.	n	5, 7, 9.
clxxiv.	2nd day	Removal of lint, which had dried on puncture.	9th day	Erysipelas	n	3, 4, 6, 12.
*cxc.	12th day	Heads came off after poulticing.	7th day (?) axillary abscess which broke.	Erysipelas, ulcer		5, 7, 9, 11, 14.
*cxciii.	14th to 16th day.	Violent removal of dressings.	9th day, white heads between places; 16th, coalescence.	Ulceration	n	5, 11.
lxiii.	In 2nd week	Unknown, perhaps from tenderness.	2nd week, burst pocks and inflammation.	Erysipelas	n	6, 11, 12, 13, 14.
*x.	13th day	Unknown, perhaps from tenderness.	13th day, burst pocks, &c.	Sloughing, subsequently tetanus.	+	11, 13.
*cci.	In 2nd week	Forming crusts, picked off ?	Succeeding injury	Ulceration of the two injured pocks only.	n	5, 12.

Column 10—continued.

Dr. Ballard's Memorandum.

Cases).	Date of Injury.	How effected.	Vaccinee.		Co-vaccinees and Subsidiary Co-vaccinees	Associated Morbific Circumstances as recorded in Columns
			Date of commencing Illness.	Nature of Illness.		
2nd Week Cases—*cont.*						
*cciv. -	About end of 2nd week.	Scabs rubbed off -	Succeeding injury -	Ulceration and abscesses.	n	2, 5, 11.
3rd Week Cases—						
xxi. -	From 3rd to 18th day.	Vesicles rubbed and at last on 18th day scabs rubbed off and sore neglected.	20th day - -	Erysipelas - -	n	6, 7, 11.
lxxxviii.	During 2nd week.	Pocks broken by rubbing.	Beginning of 3rd week.	Erysipelas - -	n	5, 11, 14.
*cxxvi. -	End of 3rd week.	One scab knocked off and sore left.	Soon after injury -	Erysipelas and abscess.	n	14.
cxlvi. -	15th day -	Pocks mechanically injured, and dirty clothing adhered.	17th day - -	Cellulitis, abscess, coalescence, &c.	n	11.
*clxiv. -	About 7th day.	Coloured woollen shawl stuck to pock.	3rd week, axillary abscess, erysipelas later.	Erysipelas and sloughing.	n	5, 11, 14.
clxvii. -	7th day -	Pocks broken by careless nursing.	15th day - -	Erysipelas - -	n	4, 9, 12.
clxix.	19th day -	Scabs forcibly torn off by unqualified assistant.	After the injury -	Erysipelas - -	n	4, 8.
*lx. -	By 8th day	Vesicles broken, apparently by rubbing.	15th day - - -	One bulla embracing all three vesicles. Sloughing.	+	1, 2, 6.
*cxcvi. -	2nd or 3rd week.	Pocks burst - -	2nd or 3rd week -	Sores at vaccinated places, leaving punched out appearance.	?	8, 11, 12, 13.
4th Week Cases—						
xxxix. -	21st day -	Scabs rubbed off, said to have been picked off.	Soon after 21st day. By 29th day extensive erysipelas.	Erysipelas - -	n	5, 11.
cvi. -	23rd or 24th day.	One scab knocked off by shield.	A few days after injury.	Erysipelas - -	n	11.
*lii. -	In 4th week	Crusts came off from poulticing; but before this frequently "scrubbed."	In 4th week after poulticing.	Ulceration - -	n	5, 6, 11, 13.
5th Week and later Cases—						
*xli. -	Apparently late or after 4th week.	Scabs apparently rubbed off.	5th week, blebs, sores, and then erysipelas, &c.	Erysipelas, &c. -	n	11.
lxxxi. -	29th day -	Crusts detached during convulsions.	30th day - -	Erysipelas, axillary abscess.	n	13, 14.
Uncertain—						
lix. -	Uncertain -	Small scabs rubbed off.	Subsequently - -	Places did not heal, but arm became inflamed and abscess in both knee joints.	n	11, 12.

Dr. Ballard's Memorandum.

Column 11.—Improper Management or Neglect.

Cases.	When.	Nature of Mismanagement.	Date of commencing Illness of Vaccinee, and its Nature.	Co-vaccinees and Subsidiary Co-vaccinees.	Associated Morbific Circumstance as recorded in Columns
1st Week Cases—					
xviii.	Late in illness	Sticky applications; child improving before their use.	3rd or 4th day, pocks broken; 8th day, much inflamed and erysipelas spread.	(+)	1, 8, 10.
xl.	First day	Old shield often used before.	By 7th day greatly inflamed, then erysipelas and abscess.		4, 5, 12, 13.
*xxxv.	2nd week	Cream, rags, and poultices.	By 8th day much inflamed, subsequently extensive erysipelas, ulceration.	(+)	4, 9, 14.
*xxvii.	2nd week	Bread poultices and sweet oil, arm not kept clean.	7th day, inflamed and lymph opaque, erysipelas, ulceration.	(+)	5, 6, 13.
cliii.	1st week	Rough nursing with dirty condition.	By 8th day pocks broken and coalesced, and skin inflamed, cellulitis.	o	5, 10.
*clv.	From 7th day	Shield used	Pock broken in 1st week; 7th day, inflamed, erysipelas, ulceration.	(+)	7, 10, 13.
xii.	5th day	Cold cream applied	8th day, redness with blebs, which crusted, and then diarrhœa.	n	10, 12, 13.
cxcvii.	From 8th day	Poultices, cold cream, and cream.	8th day, much inflamed; 12th, erysipelas extended.		7.
2nd Week Cases—					
xxii.	10th and 11th days	Shield used	7th day, pock injured; 11th day, cellulitis.	o	1, 2, 10.
*xxv.	8th day	Cream applied on rag, and on 10th day poultice over adherent dressing.	11th day, pocks came off with rag, cream continued, erysipelas and sloughing sores.	n	10, 13.
*xxix.	10th day	Cream and bread poultices.	10th day, inflamed and pocks burst, then erysipelas, sloughing, and ulceration.	n	2, 5, 6, 10, 12, 13.
lxiii.	On rupture of pocks.	Shield used	In 2nd week pocks ruptured and one large crust formed with inflammation which spread from shoulder to elbow.	n	6, 10, 12, 13, 14.
*lxxx.	8th day	Bread poultices on return from inspection, and cream later on.	A few days after inspection inflammation, and pocks ran into one sore, typical phlegmonous erysipelas.	n	5, 6, 13, 14.
*x.	2nd week	Shield used, subsequently poultices.	9th day, redness; 13th day, burst pocks and then sloughing; 23rd day, tetanus.	+	10, 13.
cxiii.	8th day	Poulticing	9th or 10th day, inflammation, erysipelas, which spread to trunk.	n	5, 10.
cxii.	In 2nd week	Shield which became filthy, and bad nursing.	2nd week, erysipelas on scalp, and trunk. Pock began on 8th or 10th day as a blister which soon crusted.	n	12, 13.
cxxiii.	8th or 9th days	Bread poultices (bread possibly infected).	10th day, erysipelas commenced at shoulder.	+	1, 5, 14.
cxxii.	Not known	Bread poultices	10th day, arm inflamed, and erysipelas spread.		5.
cxxxv.	Not known	Shield used "to protect arm."	11th day, inflammation; erysipelas spread generally.		
cxxxi.	Day of vaccination and 9th day.	Mother used her saliva to rub off lymph; on 9th day applied cream with finger.	2nd week, blisters round pocks, then erysipelas, ulceration.	n	9, 13.
cxlv.	3rd day	Circumcised for phymosis.	2nd week, inflammation, by 17th day erysipelas to shoulder, which spread.	n	5, 12.
*cliii.	From 4th day	Shield used	2nd week, inflammation, then ulceration.		1, 5, 6.
*clxvi.	From 8th day	Poultices, Fuller's earth applied with feather and finger.	9th day, swelling; by 16th day sloughing ulcers.		4, 5, 14.
*cxc.	In 2nd week	Poultices	Heads of pocks came off in poulticcs. 1st week, axillary abscesses; 2nd week, inflammation and subsequently ulcers.		5, 7, 9, 10, 14.
cxci.	From 10th day	Castor oil, cream and cold cream rubbed on with finger and feather.	10th day, erysipelas which spread extensively.	+	5, 14.
cxcix.	From 8th day	Dressed with cream	End of 2nd week, inflammation and erysipelas.		7.
*cxcii.	14th day	Old vaseline (used for other purposes) applied on rag.	9th day, white heads about pocks, then coalescence and ulcer.	n	5, 10.

Dr. Ballard's Memorandum.

Column 11—*continued.*

Cases.	When.	Nature of Mismanagement.	Date of commencing Illness of Vaccinee, and its Nature.	Co-vaccinees and Subsidiary Co-vaccinees.	Associated Morbific Circumstances as recorded in Columns
2nd Week Cases—*cont.*					
*ccii.	8th day	Dairy cream (possibly tainted) applied with finger.	2nd week, erysipelas, sloughing, ulcers, and axillary abscess.	n	5, 6, 9, 13, 14.
*cciv.	After injury to pocks.	Poultices, "yellow ointment" applied.	About end of 2nd week after injury, sloughing, ulceration, and abscesses.	n	2, 5, 10.
3rd Week Cases—					
*cciii.	3rd week	Improper things rubbed in when scabs were falling, and neglect.	Sloughing ulcers, and cellulitis.	n	14.
*cxcvi.	3rd week	Cream to burst pocks	Burst pocks forming "punched out" sores.		8, 10, 12, 13.
*liii.	To ulcer	Poultices, house leek, and cream.	3rd week, scabs fell and one ulcer formed.	+	9, 13.
xxi.	During 3rd week and previously.	Neglect of sores, resulting from pock-discharge being left to dry on.	18th day, scabs rubbed off, erysipelas.	n	6, 7, 10.
lxxxviii.	Apparently in 2nd week.	Dirty mother frequently rubbed inferior castor oil on pocks.	2nd weeks, pocks broken; 3rd week, erysipelas.	n	5, 10, 14.
xci.	Apparently throughout.	China clay, cream, violet powder, &c., with dirty linen.	19th day, erysipelas and multiple abscesses.		5, 6, 13, 14.
ciii.	After 15th day	Mother destitute, stood about in streets with child in her arms.	By 27th day, phlegmonous inflammation, multiple abscesses.	n	
*cv.	From 8th day	Poultices and cold cream.	About 20th day, erysipelas which spread, scabs came off leaving sores.	n	5, 12, 13.
cix.	Not stated	A previously used shield, said to have been washed and rebound.	21st day, erysipelas commenced.	n	14.
cxliii.	During first 2 weeks.	Wire shield, and application of Fuller's earth.	16th day, erysipelas began about a nævus.		6, 9, 12.
cxlvi.	From 15th day	Neglect and scanty dirty clothing, which stuck to injured vesicles.	17th day, cellulitis, abscesses	n	10
cxlix.	Before any redness.	Lard and inferior castor oil, with dirty fingers, then poultices.	2 or 3 weeks after vaccination, erysipelas.	n	5, 14.
*clxiv.	From 11th or 12th day, when arm was doing well.	Poultices and vigorous application with dirty finger, of lard, old linseed oil, &c., &c.	3rd week, axillary abscess, then erysipelas, and sloughing of sores.	n	5, 10, 14.
*clxxiii.	After scabs had become brown.	Sweet oil, from a village shop, which mother said did not agree.	3rd week, erysipelas, sloughing sores.	(+)	5.
4th Week Cases—					
*lii.	4th week	Poultices and then "sweet oil."	Brought off crusts and left ulcers.	n	5, 6, 10, 13.
*xx.	Some time after inspection.	Sweet oil (used also for children's heads) on unchanged lint.	Crusting imperfect. In 4th week, erysipelas commencing on shoulder, and ulceration of spots.	o	9.
xxxix.	In 3rd week	Poultices, cream, &c. to wounds left by rubbed-off scabs.	In a few days after scabs were rubbed off, erysipelas.	n	5, 10.
cvi.	2nd week	Shield used. On 23rd or 24th day it became twisted and knocked scabs off.	By 29th day erysipelas had spread over arm.	n	10.
5th Week or later Cases—					
*xli.	After scabs had fallen.	Sores dressed with cream and violet powder.	5th week, blebs and sores, then erysipelas.	n	10.
cxv.	From 8th day	House leek and cream applied with pigeon's feather.	36th day, one unhealed sore, erysipelas.	n	9.
Uncertain—					
lix.	Throughout	General neglect and carelessness.	Crusts rubbed off, sores, inflammation and abscesses in knee joints.	n	10, 12.

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Column 12.—Delicacy or Illness of Vaccinee.

——	Previous Health.	Date of commencement of Illness.	Nature of Illness.	Co-vaccinees and Subsidiary Co-vaccinees.	Associated Morbific Circumstances as recorded in Columns
1st Week Cases					
xl. - -	Delicate. Had been postponed	7th day, inflamed; then erysipelas.	Erysipelas and abscess -		4, 5, 11, 13.
*c. -	Delicate and ill nourished -	2nd day, red; 8th, much inflamed.	Erysipelas, abscess, ulceration.	(+)	4, 14.
xii. - -	Delicate from birth, neglected and improper feeding.	8th day, red; blebs which crusted.	Blebs, diarrhœa - -	n	10, 11, 13.
2nd Week Cases					
*cxix. -	Had thrush *when vaccinated* -	10th day, inflammation.	Erysipelas, ulceration, and sloughing.	n	2, 5, 6, 10, 11, 13.
cxxviii. -	Privation. Insufficiently nourished.	9th day, inflammation.	Erysipelas - -	n	6, 10, 13, 14.
lxiii. -	Vulvitis *when vaccinated* -	2nd week - -	Erysipelas - - -	n	6, 10, 11, 13, 14.
lxviii. -	Delicate - - -	8th day, vesicles burst; 2nd week, erysipelas.	Erysipelas - -	o	5, 6, 10, 13.
cxi. - -	Insufficiently nourished - -	8th day, vesicles burst; 10th, inflammation and blebs.	Inflammation and blebs	+	10, 13.
*cxxxii. -	Unhealthy. Born with bad eyes.	2nd week - -	Cellular inflammation, sloughing sores.	n	2, 5, 13.
cxii. -	Ailing from birth. Born blind.	2nd week - -	Erysipelas - - -	n	11, 13.
cxxxiii. -	Teething and artificially fed -	10th or 11th day -	Inflammation and axillary abscess.	n	14.
cxlv. -	Congenital phymosis. Diarrhœa *when vaccinated*	2nd week, inflammation; later, erysipelas.	Erysipelas - -	n	5, 11.
clxxiv. -	Debility after attack of bronchitis.	9th day - -	Erysipelas - - -	n	3, 4, 6, 10.
c xxviii. -	Delicate and bottle fed - -	11th day - -	Erysipelas - -	n	5, 9.
cxcii. -	Bad thrush and eczema when vaccinated.	By 14th day -	Erysipelas - - -	+	
*cci. -	Feeble from birth and recent measles.	2nd week, after injury.	Ulceration - -	n	5, 10.
3rd Week Cases					
xcii. -	Badly nourished and unhealthy.	16th day - -	Erysipelas - - -	n	5.
*cv. -	Had had ophthalmia and convulsions.	3rd week - -	Erysipelas, sores -	n	5, 11, 13.
cxliii. -	Strumous first child with nævi	16th day - -	Erysipelas, abscess -		6, 9, 11.
clxvii.	Just recovered from bronchitis. Teething.	15th day - -	Erysipelas - -	n	4, 9, 10.
*cxxi. -	Puny seven months' child probably syphilitic.	3rd week - -	Ulceration and axillary abscess.	n	
*cxxix. -	Scrofulous - - -	By 4th week -	Ulcers which healed by 11th week, various scrofulous ailments, &c.	n	2, 5, 13.
cxcvi. -	Puny, ill nourished, suspected syphilis.	3rd week - -	Burst pocks and sores -		8, 10, 11, 13.
5th Week or later Case.					
*clxxvi. -	Puny, very weakly child of epileptic mother.	By 31st day coalescence.	Erysipelas and sloughing.	n	5.
Uncertain—					
lix. - -	Scrofulous, neglected illegitimate child at nurse, and recent measles.	Uncertain - -	Sores, inflammation, abscesses on knee joints.	n	10, 11.
cliv. -	Not well when vaccinated -	Uncertain - -	Inflammation and burst pocks, vomiting, and convulsions.	(+)	4, 5, 13.
clxxix. -	Delicate and bottle fed - -	After 3 weeks -	Erysipelas - -	n (+)	4, 5.

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Column 13.—*Relation to Family Health or Peculiarities.*

Cases.	Family Unhealthiness, Sickness, or Peculiarities.	Vaccinee.		Co-vaccinees and Subsidiary Co-vaccinees.	Associated Morbific Circumstances as recorded in Columns
		Date of commencing Illness.	Nature of Illness.		
1st Week cases—					
xv. -	Unhealthy tuberculous family	7th day, inflamed; 8th, erysipelas.	Erysipelas - -	n	5.
xvii. -	Sore throats recently prevalent in family.	4th day, redness; by 10th, erysipelas.	Erysipelas - -	n	5, 6.
xl. -	Weakly family. ⅔ other children dead.	7th day, inflamed, then erysipelas.	Erysipelas and abscess	—	4, 5, 11, 12.
*xxvii. -	Another child in family had hip joint disease, and others unhealthy.	7th day, inflamed and lymph opaque.	Erysipelas, ulceration	(+)	5, 6, 11.
*xciv. -	Marked family tendency to phthisis.	3rd day, ill; 5th, redness.	Erysipelas, ulceration, abscess.	(+)	4.
xxiv. -	Family susceptibility to erysipelas.	8th day, broken vesicles, large areola.	Erysipelas - -	n	6, 10.
cxxx. -	Mother delicate. [A first child]	1st day, inflamed then	Blisters spread over all deltoid region.	n	
cl. -	Mother at vaccination and previously had inflammatory sore throat.	6th day, broken pocks; 8th, inflammation.	Erysipelas - -	n	6, 9, 10, 14.
civ. -	A previous child died (unvaccinated) of erysipelas.	8th day, erysipelas; near the eye.	Erysipelas - -	n	1, 3, 5.
cxxxix.	Father syphilitic. Sister scrofulous.	8th day, broken pocks and inflamed.	Erysipelas, axillary abscess.	n	5, 10.
*clv. -	Father gouty. Mother delicate	1st week, pock broken and inflamed.	Erysipelas, ulceration	(+)	7, 10, 11.
clxxv. -	Father two days before vaccination day had sore throat, ending in abscess.	By 7th day - -	Erysipelas - -	n	6, 10.
xii. -	Father a delicate youth -	8th day, redness and blebs.	Blebs about pocks which crusted.	n	10, 11, 12.
2nd Week Cases—					
*xxv. -	Some kind of febrile ailment in family.	2nd week - -	Erysipelas and sloughing sores.	n	10, 11.
*xxix. -	Mother with ulcerated legs -	10th day, inflammation.	Erysipelas, ulceration, and sloughing.	n	2, 5, 6, 10, 11, 12.
xxxviii.	Mother with purulent discharge from ear.	9th day, inflammation	Erysipelas - -	n	6, 10, 12, 14.
lviii. -	Weakly parents. Previous child died after vaccination from "Pemphigus gangræ-nosus."	6th day, vesicles broken; 13th, blebs.	Erysipelas - -	n	10.
lxiii. -	Mother with septic uterine discharge.	2nd week, inflammation.	Erysipelas - -	n	3, 10, 11, 12, 14.
lxviii. -	Mother with suppurating sore, father later on had a thecal abscess.	8th day, broken pocks; 2nd week, erysipelas.	Erysipelas - -	o	5, 6, 10, 12.
*lxxx. -	Mother with discharging sore on ear.	2nd week - -	Erysipelas and ulceration.	n	5, 6, 11, 14.
*x. -	Weakly family - -	9th day, redness; 13th, burst pocks.	Sloughing. Tetanus	+	10, 11.
cxi. -	Children of family weakly -	8th day, broken pocks; 10th, inflammation.	Inflammation and blebs (? eczema).	+	10, 12.
*cxxxii. -	Mother unhealthy - -	2nd week, cellular inflammation, &c.	Cellular inflammation, sloughing sores.	n	2, 5, 12.
cxxxvi.	Sore throats in the family -	9th day - -	Erysipelas - -	n	5, 9.
cxii. -	Mother had four children stillborn, two others died.	2nd week - -	Erysipelas - -	n	11, 12.
*cxxxi. -	During previous 18 months three deaths in family, viz., from pneumonia, diarrhœa, and measles.	2nd week, blisters round pocks.	Erysipelas ulceration	n	9, 11.
cxliv. -	¾ mother's children stillborn -	10th day - -	Erysipelas - -	o	9, 14.
clix. -	Mother with discharging abscess in ear.	9th day, evening -	Erysipelas - -	n	6, 14.
cxcv. -	Mother looks unhealthy. Another child strumous and with eczema.	10th day - -	Erysipelas - -	n	5.
*ccii. -	Mother specially liable to erysipelas.	2nd week - -	Erysipelas, sloughing ulcer, and axillary abscess.	n	5, 6 9, 11, 14.
*cxlviii. -	Mother delicate with erysipelas. Children strumous.	2nd week, pocks broke	Ulcer - -	n	5, 6.
3rd Week Cases—					
*liii. -	A tuberculous family - -	3rd week, ulceration -	Ulcer, scarlatina -	+	9, 11.
*xlii. -	Mother markedly scrofulous -	21st day - -	Sloughing ulcers, erythema.	o	5.

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Column 13—continued.

Cases.	Family Unhealthiness, Sickness, or Peculiarities.	Vaccinee.		Co-vaccinees and Subsidiary Co-vaccinees.	Associated Morbific Circumstances as recorded in Columns
		Date of commencing Illness.	Nature of Illness.		
3rd Week Cases—*cont.*					
lxiv.	Father with sore leg, mother recent sore throat.	19th day	Erysipelas and bronchitis.	n	6.
xci.	Mother had discharging mammary abscess.	19th day	Erysipelas and multiple abscesses.		5, 6, 11, 14.
xcviii.	Mother with mammary abscess	18th day	Erysipelas		6, 14.
*cv.	Other children deformed or rickety.	3rd week	Erysipelas, sores	n	5, 11, 12.
cxciv.	Mother with phlegmasia dolens. Aunt, phthisical.	3rd week	General crops of blebs	n	1, 2.
*cxxix.	Family tendency to phthisis and skin affections.	By 4th week	Ulcers	n	2, 5, 12.
*cxcvi.	Mother had sore eyes and sore throat (syphilis ?).	3rd week, pocks burst	Sores, measles		8, 10, 11, 12.
4th Week Case—					
*lii.	Mother with purulent discharge from eyes.	4th week	Ulceration	n	5, 6, 10, 11.
5th Week Case—					
xxxi.	Mother strumous and subject to abscesses.	5th week	Erysipelas, ulceration, abscess in axilla.	n	10, 14.
Uncertain—					
cliv.	Father delicate. Mother with phthisical family history.	- - - -	Inflammation, burst pocks (vomiting before vaccination).	(+)	4, 5, 12.

Column 14.—Opening of Vesicles on 8th Day.

Cases.	For Use.	Not for Use.	Date of commencing Illness, and what.	Circumstances pointing to possible Infection at that Time or subsequently.	Sub-Vaccinees.	Co-Vaccinees and Subsidiary Co-Vaccinees.	Associated Morbific Circumstances as recorded in Columns
1st Week Cases—							
*c		+	2nd day, red; 8th day, much inflamed, erysipelas, abscess, and ulceration.	Great recklessness of deranged vaccinator.		(+)	4, 12.
ci.		+	By 8th day extensive erysipelas.	Great recklessness of deranged vaccinator.		(+)	4, 10.
*xxxv.	+		5th day, red; by 8th much inflamed, erysipelas, ulceration.	Rough vaccination, during scarlatina epidemic.	Yes; but not identified.	(+)	4, 9, 11.
lxxxv.	+		1st week, ill; 2nd week, erysipelas and abscess.	Infected operator	±	+	
cxvi.		+	2nd day, red; by 8th day redness extended; later, erysipelas.	Erysipelas prevalent	o	n	1, 2, 7, 9.
*cxvii.	+		7th day, inflamed, erysipelas, ulceration.	Overcrowding, filth at home.	+	+ (+)	4, 5, 9.
cl.		+	6th day, pocks broken; 8th, inflamed, erysipelas.	Mother, at that time and previously, inflamed sore throat.		n	6, 9, 10, 13.
*clxxxviii.		+	6th day, red; 8th, redness extended, erysipelas, and ulceration.	——		n	5, 8.
2nd Week Cases—							
xvi.	+		10th or 11th day, inflammation, erysipelas.	Vaccinator had erysipelas three or four days after child.	+	(+)	
xxiii.		+	Night of inspection first inflamed, erysipelas.	Wore an unwashed maroon coloured frock.	o	n	
xxxiv.	+		13th day, erysipelas	Operator vaccinated in one place. Proceedings not those of the Board.			4.

Column 14—continued.

Dr. Ballard's Memorandum.

Cases.	For Use.	Not for Use.	Date of commencing Illness, and what.	Circumstances pointing to possible Infection at that Time or subsequently.	Sub-Vaccinees.	Co-Vaccinees and Subsidiary Co-Vaccinees.	Associated Morbific Circumstances as recorded in Columns
2nd Week Cases—*cont.*							
xxxviii.		+	9th day, inflammation, erysipelas.	Mother purulent discharge from ear; dress stuck to pricked pocks.	o	n	6, 10, 11, 12, 13.
xliv. -	+		13th day, redness, erysipelas.	——	n	n	
lxiii. -	+		2nd week, inflammation which spread.	Vulvitis when vaccinated. Mother had septic uterine discharge.	n	n	6, 10, 11, 12, 13.
*lxx. -	+		2nd week, multiple abscesses, ulceration.	Septic effluvia from knacker's premises.	n		5.
*lxxx. -	+		Early 2nd week, erysipelas and ulceration.	Mother slatternly, sore on ear. Bread poultices and cream used on return from inspection.	n	n	5, 6, 11, 12.
*lxxxiv. -	+		9th day, inflamed; subsequently, erysipelas and ulceration.	Vaccinator probably infective.	+	(+)	3.
lxxxvi. -	+		9th day, irritable; 12th day, erysipelas.	——	n	n	
cxiv. -	+		9th day, erysipelas commenced.	Unwholesome filthy surroundings.	n	n	5.
cxxiii. -	+		10th day, erysipelas, which commenced at shoulder.	Bread poultice. Food foully kept. Bad drainage.	+	(+)	1, 5, 11.
cxxxiii.		+	10th or 11th day, arm red and swollen, axillary abscess.	——	o	n	12.
cxxviii.	+		12th day, erysipelas commenced on anterior fold of axilla.	11th day, visited case of ulcer and erysipelas.	+	(+)	6.
cxliv. -		+	10th day, erysipelas commenced.	——	o	o	9, 13.
clix. -		+	Evening of 9th day, erysipelas commenced.	Mother discharging abcess in ear. Father attacked also with sore throat.	o	n	6, 13.
*clxvi. -		+	9th day, swelling; by 16th day, sloughing ulcers.	Poulticing. Fuller's earth applied with feather and finger. Very dirty home.			4, 5, 11.
clxxvii.	+		10th day, erysipelas commenced.	Scarlatina in neighbouring cottages.	n	n	8.
clxviii. -		+	9th day, redness below pocks, which spread.	Erysipelas very prevalent. Home nuisances.	o	n	5, 7.
*cxc. -	+		1st week, axillary abscess; 2nd week, inflammation, and ulcers subsequently.	Filthy home. Erysipelas and scarlatina prevalent.	n		5, 7, 9, 10, 11.
cxci. -	+		10th day, erysipelas, which spread extensively.	Poulticing. Castor oil and cream applied with fingers.	o	(+)	5, 11.
cii. -	+		In course of 2nd week -	Dirty home. Mother sore throat; cream applied, &c.	n	n	5, 6, 9, 11, 13.
*xix. -		+	11th day, deep sloughing ulcer from coalescence.	Unwholesome surroundings, with putrid emanations.	o	n	5.
3rd Week Cases—							
xxviii. -	+		3rd or 4th week, erysipelas -	——			
lxxxviii.	+		3rd week, erysipelas (2nd week, pocks broken).	Dirty surroundings and dirty mother. Pocks rubbed with dirty fingers, and inferior castor oil.	n	n	5, 10, 11.
xci. -		+	19th day, erysipelas and multiple abscess.	Dirty home and mother, who had also discharging mammary abscesses.			5, 6, 11, 13.
xcviii. -	+		By 18th day erysipelas diffused.	Mother suckled child from breast with abscesses in it.	n		6, 13.
cix. -	+		21st day, erysipelas commenced.	Previously used shield -	n	n	11.
*cxxvi. -	+		(3rd week, scab knocked off and sore left), erysipelas, abscess.	——		n	10.
cxlix. -	+		2nd or 3rd week after vaccination, erysipelas.	Dirty mother and dirty applications.	+	n	5, 11.
*clxiv. -		+	3rd week, axillary abscess, and then erysipelas and sloughing.	Dirty mother and improper applications.	o	n	5, 10, 11.
cc. -	+		About 15th day, erysipelas commenced.	Erysipelas prevalent. Mother recently diphtheritic(?) sore throat.	o	n	7, 8.

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Columns 14—continued.

Cases.	For Use.	Not for Use.	Date of commencing Illness, and what.	Circumstances pointing to possible Infection at that Time or subsequently.	Sub-Vaccinees.	Co-Vaccinees and Subsidiary Co-Vaccinees.	Associated Morbific Circumstances as recorded in Columns
3rd Week Cases—*cont.*							
*eciii. -	+		About end of third week, sloughing, ulceration and cellulitis.	Improper applications when scabs were falling.	n	n	11.
*clvi. -	+		Opened vesicles formed sores. 9th week, erysipelas began near ear.	Erysipelas prevalent. Possible fomites concerned.	n	n	2, 7.
4th Week Case—							
lxvii. -		+	Pocks healed, erysipelas commenced at elbow.	Home dirty, with unwholesome surroundings.	o	n	5.
5th Week or later Cases—							
xliii. -	+		2 weeks after healing, erysipelas.	Defective drainage - -	+	n	5.
lxxxi. -		+	5 weeks after fall of scabs, erysipelas, ulceration, and axillary abscesses.	——	o	n	10, 13.
cxxiv. -	+		31st day, scabs having fallen, erysipelas.	Home surroundings unwholesome, above the average.	n	n	5.

Addendum C.

The following is a selection of such cases and series or cases (whether included among the tabulated allegations or found on search among the older records of the Board) as are sufficiently fully recorded and of such a kind as to assist in determining the incubation of erysipelas and allied abnormalities in association with vaccination.

They appear to show that in this association the incubation of erysipelas (normally, according to Fehleisen's inoculation-observations 15 to 61 hours) does not usually last beyond the period of one week, but that the first indications of mischief often appear before the 4th or 6th day from the application of the specific cause.

As regards any introduction of specific contagium by the proceedings of the operator it is to be kept in mind that there are two occasions in which these proceedings may lead to mischief, viz., at the time when the vaccination is performed, and again at the time when pocks are opened by puncture or otherwise dealt with by him. Accordingly, the period of incubation must be counted in the one case from the day of vaccination and in the other from the day of subsequent interference.

In addition to the Henstead, Thingoe, and Redruth series of accidents referred to later on, the following in the table of allegations appear adapted to assist in the determination of this question. They are cases in which the date of introduction of the contagium is determinable with more or less probability.

Case.	Date of commencing Illness.	Probable occasion of Introduction of Morbid Contagium.	Date of probable Introduction.	Probable Incubation.	Nature of Abnormality.
xl. -	By 7th day -	Unqualified vaccinator using habitually old points. A shield, often used before, put on the day of vaccination.	Day of vaccination -	Under 7 days -	Erysipelas.
lxv. -	By 8th day -	Habitual neglect of due precaution. Probable use of infective tube lymph.	Day of vaccination -	Under a week -	Septic (erysipelatous) inflammation.
xxxi. -	By 8th day -	„ „ „ -	Day of vaccination -	Under a week -	„ „
xxxv.	6th day - -	Careless vaccinator. Operating instrument used for other purposes.	Day of vaccination -	About 6 days -	Erysipelas.
lxii. -	2nd day - -	Vaccinifer with excessive areola (habitual fault of the vaccinator).	Day of vaccination -	A few days -	Erysipelas.
cxviii.	1st day, first appearance of redness.	Operator probably infective -	Day of vaccination -	One day - -	Erysiyelas.
clxi. -	3rd day - -	Use of infected bedding -	At and immediately after time of vaccination.	Under 3 days -	Erysipelas.
clxii. -	6th day - -	„ „ -	„ „ -	- -	Erysipelas.
cviii. -	6th day, inflamed.	Vaccinator personally infective.	Day of vaccination -	About 6 days -	Erysipelas.
c]xxv.	By 7th day -	A home infection from father's sore throat.	In course of 1st week -	Under 7 days -	Erysipelas.

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Case.	Date of commencing Illness.	Probable occasion of Introduction of Morbid Contagium.	Date of probable Introduction.	Probable Incubation.	Nature of Abnormality.
xxxviii.	9th day, inflamed.	Probable septic infection from mother who had sore on ear, not unlikely to have been imparted on 8th day when dress stuck to pricked vesicles.	On 8th day or possibly earlier.	Under 1 week, probably only 1 day.	Erysipelas.
lxiii. -	In course of 2nd week.	Open vesicles, probably infected by septic discharges.	After 8th day - -	A few days -	Erysipelas (slight), child died from bronchitis.
lxxx. -	In course of 2nd week.	Open vesicles, probably infected by septic discharge from mother's ear.	After 8th day -	A few days -	Erysipelas.
cxxviii.	12th day - -	On day before attack exposed to septic infection at grandmother's house.	On 11th day - -	One day - -	Erysipelas.
clix. -	9th day - -	Opened vesicles probably infected by discharges from mother's ear.	On 8th day - -	One day - -	Erysipelas.
clxvi. -	9th day - -	Probably brought about by filthy instrument of operator, either at vaccination or when vesicles were needlessly opened.	Either day of vaccination or on 8th day.	9 days, or more probably 1 day.	Erysipelas and ulceration.
clxxiv.	9th day - -	Exposure to septic infection on 8th day and perhaps earlier from improper applications to vaccinated spots injured on 2nd day.	Either 8th day or previously.	8 days or 1 day	Severe inflammation, which subsided. Child died of bronchitis.
cxlvi. -	17th day - -	On 15th day dirty clothing stuck to injured pocks, but there was also general neglect.	On 15th day - -	2 days - -	Cellulitis and abscess.

Further, it is to be observed in referring to Table II. and the summary of Columns 1, 2, 3, and 4 in Addendum A., where circumstances are noted indicating with more or less probability dangers due to unfitness of the vaccinifer and neglect of due precautions on the part of the vaccinator, that one-half of the cases of illness, viz., 21 out of 42, dated their commencement in the course of the 1st week. No such large proportion of 1st week cases is to be noted in the other columns with the exception of the Columns 7 and 8 which are scarcely comparable with it for obvious reasons. It is to be noted further, as regards this summary table, how very frequently the co-vaccinees and subsidiary co-vaccinees of the 1st week cases suffered as compared with those enumerated among the 2nd and 3rd week cases; a fact which corroborates the view of these 1st week cases having been causally associated with the faults recorded while the influence of these faults is thus far less obvious among the 2nd and 3rd week cases. Among the 21 1st week cases in the summary table there were 17 in which the co-vaccinees, the subsidiary co-vaccinees, or both, suffered more or less from abnormalities, and only two in which they were not known to have suffered; while among the 122nd week cases there were only three in which they are known to have suffered and four in which they are known not to have suffered. Among the seven 3rd week cases there were but two in which they were known to have suffered while there are four in which they are known not to have suffered. And as respects the five 2nd and 3rd week cases, whose co-vaccinees or subsidiary co-vaccinees suffered, this is further to be said, viz., that in cxx. the erysipelas began, not about the vesicles but at the seat of a broken axillary abscess and towards the end of the second week, so that it is quite probable that the infection was admitted at this spot and not where the vaccination was performed: that in lxxxiv. the infection was imparted most probably (see *infra*, *re* Thingoe Series) not on the day of vaccination but on that of inspection: that in cxxiii. the erysipelas did not begin at a vaccinated spot but on the shoulder, and in connexion with foul surroundings and improper applications to punctured vesicles, although it is probable that the vaccinifer was incubating erysipelas at the time he was used for the supply of lymph, the co-vaccinees of cxxiii. only suffering to a trifling extent: that in lx. there is no reason whatever to attribute the illness either to a morbid condition of the vaccinifer or to the operation except in so far as the operator was incautious in using an illigitimate vaccinifer at all; but that the sloughing ulceration (not erysipelas) was probably due to accidental infection from a mammary abscess on the vaccinifer's mother which was imparted on the occasion of the vaccination of lx. to the co-vaccinee and to the opened vesicles of the vaccinifer also: and finally, as regards clxxiii. there can be little doubt that the mischief arose out of the unwise treatment to which the arm was subjected after the pocks had duly scabbed.

It appears to me that a somewhat similar esson may be drawn from the cases recorded under Column 11. (where the children were neglected or subjected to improper management of one kind or another, including, of course, improper or dangerous applications to the arm) by comparing the data of commencing mischief with the dates of these several occurrences.

Of course, of the eight first week cases, four, viz., xviii., xxxv., xxvii., and cxcvii., could not have been causatively due to occurrences that took placel ater, and in clv. the pocks broke and the arm became inflamed before the shield was applied, but in the other three cases the mischief commenced in the same week and shortly after in the occurrence recorded.

Among the 21 2nd week cases there are in Col. 11 nineteen in which the date of the occurrence recorded is fairly known (what the occurrence was may be seen by reference to the Addendum B.). In xxii. cellulitis appears to have commenced the day after a shield was put on, but might not have been due so much to this as to the other circumstances recorded. In xxv. the mischief appears to have commenced only a very few days after the occurrence recorded. In xxix. there is no ground for supposing that the applications produced the mischief. In lxiii. the shield was not applied until the mischief had commenced with the rupture of the pocks. In lxxx. the meddlesome treatment was not commenced before the 8th day, and the erysipelas commenced a few days after. In x. the mischief had commenced before the shield was applied. In cxiii. the inflammation commenced the 1st or the 2nd day after the poulticing. In cxii. the relation of time between the mismanagement and the mischief is not clear. In cxxiii. the erysipelas commenced on the 1st or 2nd day after the application of the poultices. In cxxii. the mischief, if in any way promoted by the poulticing, was probably not delayed beyond a week, since it is not likely poultices would have been applied within the first few days from the vaccination. A similar observation applies to the use of the shield in cxxxv. In cxxxi. the first indication of mischief appeared towards the end of the 2nd week, cream having been applied on the 9th day. In cxlv. it is not clear how far the wound from the circumcision, two days after vaccination was concerned in the subsequent erysipelas; it certainly furnished an additional opportunity for the introduction of erysipelatous contagium, which seems to have taken effect, some time in the

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course of the 2nd week. In clii. the mischief appears to have commenced eight days after the shield began to be used. In clxvi. improper applications were made to the opened vesicle on the 8th day, and the mischief commenced on the very next day. In cxc. the inflammation appears to have commenced before the poultices were applied. In cxci. it would appear that probably the improper applications recorded were not made until the arm looked inflamed. In cxcix. the cream began to be applied on the 8th day and the erysipelas began towards the end of the week. In cxciii. the mischief appears to have begun before the improper applications were made. In ccii. the improper applications on the 8th day after pocks had been opened was followed by erysipelas within seven days. In cciv. the mischief appears to have commenced before the poultices, &c. were used.

Passing on now to the 14 third week cases in Col. 11, there is one of these in which the date of occurrence of the mismanagement is not mentioned, and 13 in which it is fairly known. In cciii. it appears that the rubbing in of improper things did not commence until the scabs began to separate which would probably be some time in the 3rd week, at the end of which the ulceration seems to have commenced. In cxcvi. the vesicles had apparently burst, and the ulcerative process commenced before the application of the cream. In liii. also the improper applications were made to an already existent ulcer. In xxi. the neglect appears to have occurred throughout the course of the pocks, the erysipelas commencing about two days after injury to the crusting vesicles. In lxxxviii. the erysipelas appears to have commenced very shortly after the improper application to the injured vesicles. In xci. it is impossible to apportion the blame between septic infection from the mother and the filthy applications made with her dirty fingers which the pocks seem to have been subjected to from an early period. In ciii. it seems certain that there was no neglect or mismanagement before the 15th day, and it is not known when the mischief, which was found advanced on the 27th day, commenced. In cv. poulticing and application of cream seems to have been pretty well continuous up to the 20th day, about which day the erysipelas commenced. In cix. it is unknown at what period the shield was first used. In cxliii. the shield was applied during the first two weeks and there is nothing to show what part, if any, it had in occasioning the erysipelas. In cxlvi. the mismanagement appears to have commenced on the 15th day, and the cellulitis two days after. In cxlix. the improper applications were made with the object of assisting the fall of the crusts which would probably have been towards the end of the 2nd or in the 3rd week. It may be gathered from this as not improbable that the erysipelas commenced not very long after these applications were made. In clxiv. filthy applications were vigourously made from the 11th or 12th day up to which time everything had gone well; it does not appear when the erysipelas commenced, but it was of great extent with sloughing of the vaccination wounds about 18 days later, an abscess having in the meantime formed and broken in the axilla. In clxxiii. the precise dates of the application that "did not agree" and the commencement of the arm mischief are undetermined, but probably the interval was not much over a week.

Of the 4th week cases there are four in which the dates are fairly known. In lii. the poulticing was not commenced before the 4th week, the crusts were thus detached but left ulcers behind. In xx. the improper treatment appears to have commenced at some time after inspection, and to have been continued to the disturbance of the healing process. The erysipelas commenced on the 25th day, but at what period the infection was actually introduced cannot be known. In xxxix. poultices were not applied until the scabs were rubbed off, a few days after which the erysipelas appears to have commenced. In cvi. the crusts were knocked off (by the shield that had been applied) on the 23rd or 24th day, and the erysipelas must have commenced very shortly afterwards as it had spread over the arm by the 29th day.

Of the 5th week cases there were two. In xli. the erysipelas appears to have commenced very shortly after the improper dressings. In cxv. improper applications began to be made from the 8th day, with the result that one of the spots did not heal, and on the 36th day erysipelas commenced. Of course it is impossible to say at what period of these applications the contagium chanced to be introduced.

In all these instances there is no indication of prolonged incubation where the mismanagement could be regarded as causally associated with the subsequent mischief.

So again referring to the cases enumerated in Column 10, where vesicles had been injured or had ruptured from any cause during the progress of the vaccinia, much the same lesson is to be derived. In these cases it must be held that at any rate an opportunity was afforded for the introduction of a contagious principle at the injured spot in one way or another, the chances of such introduction being shown in the second of the tables relating to this column in Addendum A.

Thus among the 1st week cases we find in xviii. the vesicles ruptured on the 3rd or 4th day, and much inflammation existent by the 8th. In ci. it is not clear whether the badly rising vesicles ruptured before the erysipelas commenced. In lxii. the vesicles ruptured on the 6th day and by the 8th day the arm had become inflamed. In lxxviii. and lxxix., which are stated to have been cases of pyæmia, it is probable that the rupture of the vesicles was the earliest evidence of local abnormality and mischief which thus terminated. In xxiv. the rupture appears to have occurred towards the end of the 1st week, and by the 8th day the erysipelatous inflammation had become worse. In cxviii. the vesicles ruptured on the 3rd day, and by the 5th day inflammation had greatly extended; the rupture of the vesicles, however, would appear to have been a mere accompaniment of the erysipelas which began to appear as redness round the punctured spots on the 1st day. In cvii. and cvii.a the rupture of the vesicles were probably part of the local erysipelatous attack. In cl. the rupture might again have been due to the commencement of erysipelatous mischief, at any rate the inflammation was obvious on the 8th day. In cxxxix. the vesicles were found ruptured by the 8th day, when there was a too extensive areola, the erysipelatous character of which was decided by the 11th day. In cliii. the rupture and coalescence of the vesicles was probably but a part of the inflammatory action at the spot. In clv. the rupture of the vesicle during the first week and the subsequent mischief were probably part of the same diseased action. In xii. the vesicle seems to have been injured on the 6th day, and the erysipelatous mischief to have become first apparent on the 8th day. In clxxv. the rupture of the vesicles was again probably a part of the erysipelatous process. In clxxii. probably the same was the case.

More definite information upon the point in question seems capable of being gathered from the cases in which the illness commenced in the 2nd week and subsequently.

Thus among the 2nd week cases we find in xxii. the pocks injured on the 7th day and cellulitis commencing on the 11th. In xxv. injury was inflicted on the 11th day, and about five days after there was extended erysipelas. In xxix. the rupturing of the pocks and the commencement of the erysipelas appears to have been simultaneous. In xxxviii. injury was inflicted on the 8th day and the next day the erysipelas appears to have commenced. In lviii. the rupture of the vesicles on the 6th day appears to have been the commencement of the local mischief, which subsequently extended. In lxviii. the injury was inflicted on the 8th day, and the erysipelatous inflammation commenced in the course of the 2nd week. In cxi. the broken vesicles seen on the 8th day might have been the earliest indication of the disease that subsequently became apparent. In cxx. it is not clear that the injury to the pocks had anything to do with the subsequent erysipelas which started from an axillary abscess which had recently broken. In cxiii. the injury appears to have been inflicted on or before the 8th day and the erysipelatous inflammation commenced on 9th or 10th day. In lxiii. the rupture of the pocks was probably part of the erysipelatous mischief. In x. there was no erysipelas, but the rupture of the pocks manifest on the 13th day must be regarded as affording an opportunity for the admission of the specific virus of the tetanus which apparently began to operate on the 23rd day, 10 days later. In cci. ulceration followed the picking off of crusts in the 2nd week. The child died a fortnight later. This proceeding was evidently the cause of the ulceration that shortly followed. In cciv. the local mischief commenced only a few days after the injury to the pocks.

The 3rd week cases furnish the following facts:—In xxi. the crusts became detached on the 18th day, the

erysipelas began two days after. In lxxxviii. scabbing vesicles were injured apparently towards the end of the 2nd week and the erysipelas began at the early part of the 3rd week. In cxxvi. a scab was knocked off about the end of the 3rd week, and apparently a few days later the erysipelas commenced. In cxlvi. the vesicles were injured on the 15th day, and in two days after the cellulitis had already become developed. In clxiv. the pocks became injured about the 7th day, and the vesicles were needlessly punctured on the 8th day. Apparently about a week later, that is about the end of the 2nd or beginning of the 3rd week, an abscess formed in the axilla, speedily followed by erysipelas. In clxvii. the vesicles were injured on the 7th day, redness appeared on the 8th day, and erysipelas spread from the spots about the 15th day. In clxix. the scabs were torn off on the 19th day, but it is not stated how soon after the erysipelas commenced. In lx. the vesicles (late in rising) looked on the 8th day as if they had been injured, but probably their abnormal appearance was due to the mischief already commenced. In cxcvi. the breaking of the vesicles was the commencement of ulcerative process.

Among the 4th week cases, in xxxix. the scabs were rubbed off (? picked off) on the 21st day and after five or six days the erysipelas was found to be developed and extending. In cvi. on 23rd or 24th day the scabs were knocked off by the shield in use, and by the 29th day the erysipelas was extensive over the limb. In lii. the scabs came off, leaving unhealed ulcers in the course of the 4th week after poulticing.

Among the 5th week cases, are the following:—In xli. the scabs (which did not appear to have hardened properly) seem to have been rubbed off in the course of the 4th week or later, followed in a few days by erysipelas and pneumonia. In lxxxi. the crusts became detached on the 29th day, resulting almost immediately in spreading redness round the sores thus occasioned, following which was axillary abscess.

Here again there is no evidence of any prolonged incubation in such cases as appear, by the rupture or injury to pocks, to have had an opportunity of septic infection furnished at the injured spots.

Thingoe Series of Accidents. (Tabulated Allegations.)

This is a series in which there is good reason to believe that the vaccinator was personally infected and probably also his clothing, and that he imparted infection to five if not six children out of 28 vaccinated and inspected on 8th day at two out of three stations which he attended on four days, viz., October 7 (with calf lymph), 14, 21, and 28. The stations may be designated R., Flm., Fm.

All the children vaccinated at R. station did well, and from one of four, thus vaccinated there, lymph was taken on October 14 for vaccination of one child at Fm. on October 21. The child who was vaccinifer and the child vaccinated both did well, so that there is *no indication here* that the vaccinator was infected so as to impart disease to either of these children on the 14th. This vaccinee was not meddled with on the 21st. But the vaccinator had 10 hours previously been dealing during the night up to 2 a.m. of the 14th with a septic corpse of a person whom he had been just previously attending.

An hour later, on the same day, *Oct.* 14, he was at Flm. station and there vaccinated nine children.

Six of them with humanized lymph *just taken* at R. (five on points and one tube).

One with humanized lymph supplied by another P.V. And two with calf lymph.

All of these appeared to be doing well on 8th day *Oct.* 21, when they came for inspection. But *subsequently to inspection* three of the nine did badly, viz.:—

lxxxiv. attacked on 9th day with erysipelas. Died.

lxxxv. attacked in course of 2nd week with erysipelas. Died (said not to have been well, possibly from incubation of erysipelas in 1st week).

Bh. had axillary abscess on 12th day. Recovered, but had inflammation of arm in 5th week.

These three were the only cases out of the nine *whose vesicles* were on inspection day *opened* and used for supply of lymph, over whom, therefore, the P.V. *spent the longest time* and came into closest relation.

Bh. was one of the two that had been vaccinated with calf lymph.

lxxxiv. and lxxxv. had been vaccinated with lymph just brought on points from R.

All this would appear to indicate that there was nothing amiss with the lymph from R. *specially*, although taken on October 14, but *that the infection was really introduced on the day of inspection, October* 21. [Of course it may be argued against this that lxxxv. was not well during 1st week, and that the indisposition might have been an "incubating erysipelas." Of course I cannot deny the possibility of this, especially as two children vaccinated from lxxxv. at Fm. on 21st (when child was selected as a vaccinifer) subsequently suffered.]—The six remaining cases continued to do well.

On this same day, October 21, he vaccinated again at Flm. station, 11 children, viz.:—

Three of them from			lxxxv.
One	,,	,,	lxxxiv.
Six	,,	,,	Bh.
One	,,	,,	tube from R. taken from Al. the vaccinifer of lxxxv. and lxxxiv. on October 14.

All the 11 did well except three, viz.:—

lxxxiii. whose inflammation commenced on 4th day. Erysipelas on 11th. Died.

B. Inflammation commenced on evening of 8th day (not having been pricked that day), Oct. 28.

E.T. Inflammation commenced on 8th day (when it was pricked), ? after or before inspection, Oct. 28.

lxxxiii. and B. had been two of the three vaccinated (and by points) from lxxxv. when normal on 8th day.

The other (? vaccinated from points) vaccinated from lxxxv. did well.

E.T. was vaccinated by points from Bh., who at that time was not ill but had abscess later on.

The other five vaccinated from Bh. (? from points) did well.—A child vaccinated from E.T. at Fm. on 28th (when inflammation was present or impending) did well.

All these three cases might have been infected at vaccination on the 21st, certainly lxxxiii. was; *or* two of them, viz., B. and E.T., might have been infected either that day or on 28th when inspected.

Taking all the six cases together, it is quite consistent with the facts that all six were really infected on the 21st, and none of them on the 14th. Indeed, to my mind, the former view appears the more probable in view of the whole of the circumstances, and that somehow the vaccinator was in a more infective condition when he vaccinated and inspected and took lymph on the 21st than when he vaccinated on the 14th. There is no account of what he did when he went home at 2 a.m. on the morning of the 14th, but it is not unlikely that when he rose from his bed to go and vaccinate at R. and Flm. he (by way of precaution) did not put on the same clothes, but that he did subsequently resume and wear these clothes at his vaccination and inspection, after the lapse of a week, viz., on 21st and perhaps later on 28th. It was a precaution that a moderately prudent man would have been likely to take.

On Oct. 28th the children vaccinated on 21st at Flm. were inspected and four more were vaccinated at Fm.

One was vaccinated from E.T. and nothing went amiss.

Three were vaccinated from W.L. (a child who had nothing amiss with it) and did well with the exception that one of W.L.'s vaccinees had a rubeoloid rash on the 9th day.

The vaccinator's personal infectiveness seems not to have been present as a factor on that day.

If it be accepted that Oct. 21 was the day of the vaccinator's infectiveness, we arrive at the incubation periods of the six cases as follows:—

lxxxiv.—1 day.
lxxxv.—Under 1 week.

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Bh.—4 days (if an infective case at all. He was vaccinated with calf lymph).
lxxxiii.—3 days.
B.—A few hours.
E.T.— ,, ,,

The Henstead Series of Accidents. (Tabulated Allegations.)

This is a story of 26 vaccinations performed by a *locum tenens* of a Public Vaccinator at four different stations on four different days. All were abnormal in the way of burst vesicles, erysipelas, abscess, and inflammations. There was reckless use of inflamed arms, and the instrument employed was used for other purposes, and not even cleaned between operations. It includes two fatal cases, cvii. and cvii.*a* (tabulated), and 24 *non*-fatal cases. [The numbers given are those in the vaccination register. No. 70 is cvii. and No. 83 is cvii.*a*]

Date of first Appearance of Inflammation.

On 1st day in Nos.		65, 77, 78, 81.
,, 2nd	,,	67, 69, 79, 80, 82.
,, 3rd	,,	64, 72, 75, 83, 87.
,, 4th	,,	68, 84 } 66.
,, 5th	,,	70, 73 }
,, 6th	,,	74.
,, 7th	,,	None.
,, 8th	,,	63 (opened on 8th day).
		71 (pock slow rising, scarcely visible on 8th day, *i.e.*, *both pock and E. delayed*.
,, 9th	,,	86 (not opened), 88 (not opened).
,, 10th	,,	76 (opened 8th day).
Uncertain	,,	85.

Date of Bursting of Vesicles or Abrasion.

On 1st day in Nos.		None.
,, 2nd	,,	65, 67.
,, 3rd	,,	66, 75, 77, 78 } 83.
,, 4th	,,	69, 82, 87 }
,, 5th	,,	73, 74.
,, 6th	,,	68.
,, 7th or before 8th, 70, 79.		
Uncertain, but before 8th day, 64.		

Vesicles did not burst before 8th day - 63, 71, 72, 76, 80, 81, 84, 85, 86, 88.

There were *no* absolute *failures*, but seven partial failures, viz.:—

1 in 3 in Nos.		71, 72, 79.
1 ,, 4	,,	76.
2 ,, 3	,,	77, 80. } In these attack commenced
2 ,, 4	,,	81 } very early (see *supra*).

There was *axillary swelling or abscess* in axilla or elsewhere—

By 8th day, in Nos.		68.
On 10th	,,	74, 82.
,, 11th	,,	63.
Before 20th	,,	69.
By 23rd	,,	77.
Before 25th	,,	67, 73.
By 31st	,,	87.
,, 39th	,,	64.
Uncertain time		65, 78, 79, 88.

Rash (rubeoloid or undescribed or papular)—

On 3rd day in Nos.		73, 87.
,, 9th	,,	64.
,, 41st	,,	76 (papular).

Summary: Day on which *first indication of mischief*, whether *inflammation* or *breaking down* of papule or vesicle, observed—

On 1st day in Nos.		65, 77, 78, 81.
,, 2nd	,,	67, 69, 80, 82, 79.
,, 3rd	,,	64, *66*, 72, 75, 83, 87.
,, 4th	,,	68, 84.
,, 5th	,,	70, 73, 74.
,, 6th	,,	—
,, 7th	,,	—
,, 8th	,,	63, 71.
,, 9th	,,	86, 88.
,, 10th	,,	76.
Uncertain	,,	85.

[Those italicised, bursting vesicles formed earliest indication.]

The Clerkenwell Series of Accidents.

This was a series of 18 vaccinations in 1879 from an infant *said to be* normal on 8th day, but who on 9th day commenced with an attack of extensive erysipelas. The co-vaccinees of this vaccinifer had inflamed arms, and probably things had been going badly at station for some time.

Of the 18 infants, 10 suffered from erysipelas or abscesses, and 4 died (of these 10, 4 had subsequent "eczema" and recovered. Of the other 8 also, 2 had some little subsequent "eczema." That is 6 out of the 18 had subsequent "eczema").

Out of the 10, there were attacked on—
1st day, 4 (one of these was ill and *restless first night*, inflammation on 3rd day).
2nd ,, 2 (one was ill on 2nd day, but insertions formed sores, not rising properly).
5th ,, 2.
By 8th day, 2.

Every one of these began to be ill in *1st week*.

It is quite possible that the vaccinating instrument might have been infected in this series.

Plomesgate Union (October 1878).

This is an account of a series of cases of erysipelas, inflamed arms, and other abnormalities which occurred in the practice of a Public Vaccinator at three of his stations on three days of his periodical weekly attendance at them. The principal facts ascertained on inquiry are placed in the form of a Genealogical Chart appended. (*See* opposite page.)

It relates altogether to 28 vaccinations.

It appears that there was in the neighbourhood a case of epilepsy with which erysipelas was associated. The patient died on October 3rd, the day on which the first three of the 28 vaccinations were performed with lymph obtained from the National Vaccine Establishment. There were but two medical men in the district, namely, the Public Vaccinator and his partner, and Dr. Seaton, at that time Assistant Medical Officer of the Board, was informed by the Public Vaccinator that this case was *principally* attended by his partner, the natural inference being that the Public Vaccinator himself sometimes visited it and in this way have become (or his clothing) personally infective. Dr. Seaton on considering the reported facts arrived at the conclusion that the hypothesis of personal infectiveness of the operator (who it is to be kept in mind not only vaccinated the cases but inspected them on the 8th day, and took lymph from some), best fitted the occurrences by way of explanation. In this opinion I concur, although it must not be overlooked that some of the cases might have originated from the use of lymph from a vaccinifer who was potentially even if not at the time actually erysipelatous, that is to say, who was then incubating disease.

The series is instructive in another way since it is one of those that indicate a pathological relationship between the several morbid conditions which I have grouped together as Group I. in the tables appended to this Report, and by which this grouping seems to me justified. It also illustrates the association of one or more of these conditions with delay or imperfection of the vaccine vesicles and with a tenderness that leads to ready and early rupture.

OCTOBER 3rd.

N.V.E.

D. 179 (Aldeburgh).
2nd week, inflamed, and vesicles discharging.
2 months, scabs not yet fallen.

L. 180 (Aldeburgh).
Two-thirds insertion failed, one-third only a little white blister, with ring of red round it.
Night of 8th day began to inflame, and child restless.
In 3rd week (apparently) erysipelas began on left side of head, and spread to forehead and side of face.
As erysipelas subsided, abscess over spine of left scapula.

E. 181 (Aldeburgh).
8th day, decided areola and broken vesicles. Healed without further abnormality.
Scars well marked, but irregular.

OCTOBER 10th.

B. 186 (Aldeburgh).
By 8th day, arm much inflamed.
9th, 10th, and 11th day, inflammation severe; erysipelas, which subsequently extended largely.
Died.

B. 187 (Aldeburgh).
By 8th day, inflamed to elbow, then subsided.
About 3rd week, axillary abscess.

C. 182 (Aldeburgh).
In 2nd week said to have been much inflamed (but? unduly).

G. 184 (Aldeburgh).
2nd week (not before) much inflamed. Ultimately three pink scars rather glazed. (Some secondary pustules.)

T. 185 (Aldeburgh).
2nd week, much inflamed, and purulent discharge. Secondary pustules. (Said by mother to have been vaccinated from 179.)

B. 183 (Aldeburgh).
8th day, mother says much inflamed, and more so later (but?) subsided without definite erysipelas.
(Register states 180 as vaccinifer).

Y. 188 (Friston).
8th day, not much inflamed.
Vesicles opened.
Subsequently inflammation extended, and secondary pustules round spots.
Arm long healing.
Three ill-defined pink glazed scars.

B. 189 (Friston).
A delicate child.
2nd week (not before), undue inflammation.
Swelling came under axilla.
One large deepish glazed scar with brownish ring round it.

C. 190 (Friston).
8th day, apparently normal. Subsequently arm inflamed to elbow and shoulder.
Swelling came in axilla.
Healing delayed.
Three shallow pink scars, with traces of secondary pustules about them.

S. 191 (Friston).
Vesicles scarcely showed until 7th day.
2nd week, inflamed from shoulder to elbow. Healing delayed.
Three deep darkish scars.

H. 192 (Friston).
Course normal.
Three good scars.
(No lymph taken.)

B. 193 (Snape).
Course normal.
Three good scars.
(No lymph taken.)

I. 194 (Snape).
In course of 1st week, vesicles broken and discharging.
2nd week, much more inflamed.
Secondary places, which coalesced with the primary ones, forming one large ulcer under a common crust.
Not healed when seen on 40th day.

C. 206 (Snape).
Vesicles rose prematurely, but was never much inflamed.
Child said to have been very ill from it, and healing was delayed.

most probably

according to P. V.'s Register.

OCTOBER 17th.

W. 196 (Aldeburgh).
In course of 1st week, inflamed.
8th day, erysipelas from shoulder to elbow, and spread to forearm. Rash on back and thighs. Abscess in pectoral region. Sores long healing.

N. 197 (Aldeburgh).
3rd day, "flagged" and ill.
6th day, vesicles imperfect and erysipelatous blush.
7th day, erysipelas spread to chest, and then to head and back.
Died.

B. 195 (Aldeburgh).
2nd day, some abnormality of rising vesicles, "little rooves" came off, leaving red sores.
3rd day, inflamed to shoulder.
6th day, in great pain. Erysipelas extended to fingers, with blisters on them.
All subsided in three weeks. Scars faint and slightly raised.

S. 202 (Aldeburgh).
In 1st week not much inflamed, quite a mouth healing, one large scar.

P. 203 (Aldeburgh).
Quite normal.

[Dr. Airy thinks it probable that these two cases were vaccinated on October 18, and not at the Station.]

S. 204 (Friston).
7th day, pocks broken, accidentally scratched (but?)
Arm then inflamed, and inflammation extended to neck and back, but ultimately subsided.

B. 205 (Friston).
2nd day, erysipelas appeared. By 8th day it had extended from shoulder to fingers, and in two or three days more to body and ears.
Vaccinated place formed running sores.
Died.

A. 198 (Aldeburgh).
(A sickly hydrocephalic child).
Arm not inflamed, but sores formed which were long in healing.

J. 199 (Aldeburgh).
"Places never rooved over rightly, but became wounds that discharged, skinned over, and broke out again." Slight rush on body.

A. 200 (Aldeburgh).
2nd day, arm discharging.
"Places never properly rooved over," but were not much inflamed.
Swelling in axilla after healing. Two large irregular shaped shallow scars.

C. 201 (Aldeburgh).
Vesicles quickly formed.
By 8th day, vesicles broken (? rubbed) and inflamed.
Became discharging sores.
Secondary sores on shoulder and arm.
Tender axillary swelling.
Three shallow irregular pink scars raised at edge.

Dr. Ballard's Memorandum.

Chelsea (June 1875).

This is a series of cases of erysipelas and other allied abnormalities which occurred at a public station, served by a vaccinator who habitually worked in a most systematic and orderly manner, and where there was abundant space to keep vaccinifers and vaccinees apart. Erysipelas (independent of vaccination) was rife in the district at the time, but it appears that the vaccinator had not been among any cases of the kind, so that his personal infectiveness appears to be eliminated from the causation. Had he been personally infective it is not easy to understand why such a severe outbreak occurred among the children vaccinated on June 28, and very little of the kind afterwards. If the mischief had been due merely to the prevalence of erysipelas at the time, the same difficulty seems to present itself.

The following table represents the occurrences at the station among children vaccinated on the two days, June 21st and 28th, commencing with the Register No. 63, prior to which number no inquiry as to the progress of cases appears to have been made:—

Register No.	Date of Vaccination.	Vaccinifer.	Progress of Case.
63	June 21	55	8th day not inflamed. (*a.*) One vesicle burst that morning.
64	„ „	„	8th day, vaccination taken well. A week later (*b.*) general erysipelas.
65	„ „	„	Not found.
66	„ „	59	Vesicles insufficiently advanced for use.
67	„ 28	64	Failed.
68	„ „	„	Normal, but "Lichen" on 8th day.
69	„ „	„	Normal.
70	„ „	„	Failed.
71	„ „	„	8th day, excessive areola, arm much inflamed.
72	„ „	„	Failed.
73	„ „	„	Normal.
74	„ „	„	After two weeks' inflammation limited to vaccinated arm.
75	„ „	„	Normal.
76	„ „	„	Inflammation limited to vaccinated arm, commencing on 8th day and followed by a general bladdery eruption.
77	„ „	„	Normal.
78	„ „	„	After two weeks' inflammation limited to vaccinated arm.
79	„ „	„	Erysipelas commencing on 7th day.
80	„ „	„	Inflammation limited to vaccinated arm.
81	„ „	63	Erysipelas commencing on 9th day.
82	„ „	„	Erysipelas commencing on 9th day. (*c.*) Died.
83	„ „	„	Erysipelas commencing on 3rd day. Vaccination failed.
84	„ „	„	Arm much inflamed and swollen.
85	„ „	„	*Erysipelas appeared before child left station on vaccination day.*
86	„ „	„	Erysipelas commencing on 2nd day. Died.
87	„ „	„	Erysipelas commencing the 10th or 11th day. Died.
88	„ „	„	Erysipelas excessive by 6th day. Vaccination failed. Died.
89	„ „	„	Erysipelas commencing on 6th or 7th day.
90	„ „	„	Erysipelas commencing on 2nd day. Vaccination failed. Died.
91	„ „	65	(*d.*) Erysipelas commencing in evening of 1st day.
92	„ „	„	Erysipelas commencing on 4th day.

a. According to the mother's statement, however, the arm was more inflamed than in her previous children.

b. This "week later" was not the statement of the mother, whom the inspector was unable to see, but of the landlord of the house she dwelt in.

Evidently a doubt hangs about the condition of these two children, Nos. 63 and 64, who were used as vaccinifers on June 28: if not manifestly erysipelatous and so infective on that day, they must, I think, be regarded as potentially so.

c. In the first instance the mother said, in reply to the inspector's question, that the erysipelas commenced the day before the inspection day, which would be therefore the 7th day.

d. The mother stated that the child was vaccinated from No. 63, and not from No. 65 as stated in register.

Among 51 children vaccinated on the five following vaccination days, viz., weekly from July 5 to Aug. 2, there was nothing like this, although on July 5 there must have been erysipelatous vaccinifers at the station. According to the register there were only recorded one failure, one case in which there was inflammation that extended to the wrist, and five cases in which the arm was unduly inflamed. It is important to note that this P. V. was apparently not given to failure in his vaccinations.

In studying this series of vaccinations it is difficult to divest one's mind from the impression that the failures and abnormalities, so many of them distinctly erysipelatous, might have originated from the lymph furnished by the vaccinifers, Nos. 63 and 64. Not, perhaps, all of them (possibly but few or none), since on that day there was at least one child present, No. 85, who was actually suffering from erysipelas at the time. It was the practice of this vaccinator to vaccinate children in the order of their arrival, so that 85 would probably be sitting in the midst of those Nos. 79 to 92, who were vaccinated mostly from No. 63. At any rate it is clear, where dates of commencement are given, that in the majority of the cases the erysipelas commenced in the course of the 1st week, five of them on the 1st, 2nd, 3rd, or 4th day. It is to be recollected that those which commenced later, *i.e.*, from the 9th day later, might have acquired their infection on the inspection day.

Warrington Union (1871).

This is an account of occurrences of erysipelas and inflamed arms among vaccinees at the public station on three consecutive vaccination days on which an unqualified assistant was wrongfully entrusted with the work in the absence of the Public Vaccinator. Arms inflamed or otherwise abnormal were used for the supply of lymph. Use of unclean vaccinating instrument.

Particulars of cases given in appended Genealogical Chart. (*See* pages 204–5.)

Altogether there were 19 cases.

The date of commencing inflammation determined in 18 of them was—

In first week, 13.
In second week, 5.

Of the 13 commencing in the first week, all must have acquired their infection in the course of that week, and most probably on day of vaccination.

Of the 5 commencing in second week, all may have thus acquired their infection; but as none of them were vaccinated from unquestionably abnormal or even potentially abnormal arms, the infection, if received on vaccination day, must have been derived from—

a. the foul instrument used;

b. erysipelas cases present in the vaccination room.

On the other hand, all had been exposed to infection on the inspection day, and two of them had their pocks opened on that occasion, and with the foul instrument used for vaccinating.

If (as there is strong reason to believe) the vaccinating instrument was chiefly or solely in fault, it is to be observed that a large number of children vaccinated with it got no mischief at all.

Dr. Ballard's Memorandum.

The progress or development of the pocks in these 19 cases occurred as follows:—

It was apparently unaffected or normal in 11.

It was delayed, and the pocks rapidly dried up on the appearance of the inflammation in 1.

There was failure of one out of 4 (probable) insertions in 3. (In one of which there was also imperfection of one scar.)

There was apparent failure of two of the insertions in 1.

There was failure of all but one insertion in 2.

There was entire failure of insertions in 1.

Of these cases some additional details may be usefully given. [The numbers quoted are the register numbers as in the accompanying Genealogical Chart on pages 204–5.]

In three of the cases the erysipelas began elsewhere than at vaccinated spots, viz., in 62, 79, 81.

1. As to the date of commencement of the inflammation:—

Inflammation apparent at inspection on 8th day is entered as commencing in first week.

* Were used as vaccinifers. *Italic.*—Died.

Vaccinated, 4th. Inspected on 11th July.	Vaccinated, 11th. Inspected, 18th July.	Vaccinated 18th. Inspected, 25th July.
1st week, *57, 59, *60*, 7th day.	85, 81, 4th day; 82, 2nd day.	93, *94, 4th day; *89, 90, in a day or two after vaccination.
2nd week, 56, 10th day; **61*, 9th or 10th day.	76, 79, 11th day; *80, 9th day.	—
3rd week	—	—
Later	—	—
Not stated	71.	—

Vaccinated, 15th August. Inspected, 22nd August.	Vaccinated, 22nd August. Inspected, 29th August.
1st week, **129*	*133*, 3rd day.
2nd week	—
3rd week	—
Later	—

Vaccinated, September 25.

1st week, *134 little inflamed on 8th day, on 9th day inflammation extended from elbow to shoulder.

2. As to abnormalities in vaccinifers and exposure to infection at station:—

In respect of the 13 which commenced during first week:—

Vaccinated by Assistant, 9; by P. V., 4.

—	Vaccinated July 4.	July 11.	July 18.	Aug. 15.	Aug. 22.
Vaccinated from unquestionably abnormal arms.	59, 60	85, 81, 82.	0	129	133 = $\frac{1}{4}$

this abnormality being in four instances (59, 60, 81, 82), that only one pock had risen on arm of vaccinifer.

this abnormality being in one instance (85), rise of vesicles was much delayed in vaccinifer, probably by incubation of erysipelas.

this abnormality being in two instances (129, 133), that inflammation was present on arm of vaccinifer.

Vaccinated from arms stated either not at all, or not unusually inflamed, 57, 89, 90, 93, 94 = $\frac{5}{13}$.

Exposed to infection from other cases present on vaccination day, 85, 81, 82, 93, 94, 89, 90 = $\frac{7}{13}$; leaving only one case, 57, unaccounted for.

Register number attached to names.

Warrington Series.

JUNE 27.

D. 34.
Arm said not to have been at all inflamed.

Vaccinifer unknown (incorrect entry in register) but said not unusually inflamed.

Chas. S., 48.
8th day.—Only one pock had formed, said to have been not much inflamed.

John N., 1.
Normal—said no unusual inflammation.
Five fair scars.

Vaccinifers unknown—i.e., *Register not to be trusted.*

JULY 4.—16 vaccinated by Assistant, viz.: 52 to 67 inclusive.

H. C., 56.
The only subvaccinee of 34).
8th day.—Apparently normal.
10th day.—Erysipelas spread from pocks erratically to legs, and pocks dried up: axillary lump.
Recovered, four good scars. Not used as vaccinifer.

Alfred R., 57.
8th day.—Arm inflamed.
9th day.—Spread to fingers. Ill for a week.
Recovered, four good scars.

Ellen R. (his sister).
Nothing amiss.

Stewart S., 59.
8th day.—Much inflamed. Erysipelas spread to shoulder and down forearm.
13th day.—Became worse.
Recovered.

Claro A. B., 60.
7th day.—Inflammation about pocks, which were not injured.
8th day.—Pocks opened and tubes taken, *after which* spread extensively.
11th day.—Very ill. Pneumonia.
28th day.—Convulsions. DIED.

John R., 62.
8th day.—Small vesicles (delayed). Not inflamed.
9th day.—Pocks began to dry up.
10th day.—Erysipelas on 9th and 10th began *on fore-arm* (not about pocks). Extended largely and erratically. Pneumonia.
20th day.—DIED.

Jas. W. M., 63.
8th day.—One pock only rose, not inflamed.
[Was it a true vaccine pock that rose? a "septic vesicle."]
Subsequently DIED (as certified) from *small pox* and diarrhœa on September 17.

Eliz. D., 54.
Arm said not to have been unusually inflamed.
Five good scars.

Wm. N., 53.
8th day.—Inflamed round pocks.
9th, 10th days.—Extended to elbow.
Three good marks on arm.

Eight others. According to register, 53, 54, 55, 58 from 46; 61 and 64 from 51. Passed through vaccination normally, so far as was ascertained.
[Two of them (55 and 67) not seen].

JULY 11.—19 vaccinated by Assistant, viz.: 69* to 87.

* No. 68 was vaccinated from a tube at Penketh Common on July 6; had an unusual amount of inflammation.

Mary E. G., 85.
8th day.—Inflamed.
10th day.—Extended greatly.
Ill for three weeks.
Recovered.
Three fair scars on arm.

Mary W., 84.
No unusual inflammation.
Three good scars.

Thos. H. M., 81.
No pocks rose, but fourth day erysipelas began at *head of arm* (not at punctures) and spread to fingers.
Recovered. Ill about a fortnight. After recovery, weaned. After weaning, diarrhœa for one week before death, and DIED August 20.
[Illegitimate.]

Margt. S., 82.
2nd day.—Inflammation about punctures.
3rd day.—Erysipelas extended over limb and across to opposite side.
Ill three weeks.
Recovered.
Only one scar of a compound vesicle on arm.
[It seemed doubtful if she was vaccinated from 63.]

M. A. G., 76.
After inspection arm inflamed much from shoulder to elbow.
Recovered.
Two good scars.

Thos. C. M., 79.
8th day.—*Not* inflamed.
11th day.—Erysipelas *began behind left shoulder* and spread over pocks to fingers.
Recovered.
Two good, and one imperfect, scars.

Frances B., 80.
8th day.—*Not* inflamed, children vaccinated from her and tube taken.
9th day.—Inflamed and swollen. Erysipelas extended to shoulder and fingers.
Ill a week.
Recovered.
Four fair scars.

Geo. J., 74.
No unusual inflammation.
Four good scars.

Jas. H. L., 71.
Inflamed from shoulder to elbow, but not stated when.
Four good scars.

Three others (70, 69, 75).
Nothing amiss, except that one died a month later from convulsions.

Vaccinifers unknown.

Seven others passed through vaccination normally, so far as was ascertained.
[Two of them, 75 and 87, could not be found.]

According to register, 72, 73, 77 and 78 vaccinated from 54, and 86 and 87 from 57, 83 from 62.

JULY 18.—10 vaccinated, viz.: 88 to 97.

Vaccinated by Assistant.

Sarah D., 93.
(Sole Sub-vaccinee.)
8th day.—4 spots failed. Inflamed to elbow, pocks not injured.
Erysipelas extended over trunk. Abscess in axilla and near elbow.
Recovered.
Three fair scars.

Vaccinated by Assistant.

Child, 95.
Did well.

Ada M., 91.
4th day.—When pocks were beginning to rise, inflammation began and extended rapidly to neck and elbow, and parts swollen and hard.
8th day.—Inflammation said to have disappeared except round pocks, which ran their normal course, and inflammation did not reappear.
Four good scars.

Vaccinated by Assistant.

Wm. C., 89.
8th day.—Slightly inflamed.
Subsequently inflamed from shoulder to elbow. Lasted about a week. Child ill.
Recovered.
Four good scars.

Several children were vaccinated from this child by the P.V. arm.

Vaccinated by the P. V.

Arthur B., 90.
A day or two after vaccination inflamed.
8th day.—Extended from shoulder to middle of fore-arm.
Ill for three weeks.
Recovered.
Four good scars.

Vaccinifers unknown.

Five others passed through vaccination normally, so far as was ascertained.
[One (92) could not be found.]

88 vaccinated from 74, according to register.

Nothing amiss in the interval between July 18 and August 8.

AUGUST 8.

Anne G., 114.
Two good compound scars.
8th day.—Inflamed round pocks, but not to unusual extent.

AUGUST 15.—Six vaccinated, viz.: 127 to 132.

Vaccinated by the P. V.

Fredk. J., 129.
8th day.—Inflamed round pocks, apparently in excess. During night extended to elbow, and subsequently to trunk and other side, subsiding in left arm and hand.
14th day.—Pocks dying away, not ulcerated.
23rd day.—Redness disappeared, but ill and low.
24th day.—Convulsions. 25th day.—DIED.

Vaccinifers unknown, but according to register from 114.

Five other children.
Nothing amiss, so far as ascertained (two, 130 and 132, could not be found).

AUGUST 22.—Nine vaccinated, viz.: 133 to 141.

Vaccinated by the P. V.

Bertha O., 133.
3rd day.—Inflammation commenced about punctures. 8th day. —Reached elbow and across neck to right shoulder, then down left arm. 17th day.—Erysipelas had subsided in parts first attacked, and had settled in left fore-arm and hand. 25th day.—Skin of back of left hand and cellular tissue of back of fore-arm had sloughed. Vaccination pocks had healed. Much exhausted. 34th day.—DIED.

Three others (134, 135, 136 according to register).
No discovery of mischief.

Vaccinifers unknown (but from 127, according to register).

Five others.
Nothing amiss, so far as could be ascertained, but one of them, 138, died from diarrhœa on September 28, and 140 had arm inflamed. (Three, viz., 136, 139, and 141 could not be found.)

SEPTEMBER 5 and 12.—Vaccination suspended.

SEPTEMBER 26.—15 vaccinated. viz., 153 to 167 (of these five failed, but were successfully vaccinated the next week).

From tubes sources unknown.

158.
Some unusual inflammation after 8th day, but not severe.

160.
Some unusual inflammation after 8th day, but not severe; other previous children of the family said to have suffered in same way.

Alice E., 164.
Only one spot took. One good scar. Recovered.
8th day.—Little inflamed. 9th day, and subsequently extended elbow to shoulder, red, swollen and hard.

Four children. No account of them.

Seven others. Normal, so far as ascertained (154, 155, 156, and 167 could not be found).

Dr. Ballard's Memorandum.

In respect of the 5 which commenced in second week.

All were vaccinated by assistant, and he also certainly inspected three of them, 56, 62, and 80, and from two of them, 62 and 80, took lymph. He was present also when the other two, 76 and 79, were inspected, and probably (as he seems to have done most of the work) on July 18 inspected them also.

Of the five, there were vaccinated from unquestionably abnormal arms, none.

Exposed to infection of other cases on vaccination day, 76, 79, 80 = 3.

Exposed to infection of other cases on inspection day = All,

and of these the vesicles were also opened for use, 62 and 80 = 2.

[These two cases would seem to have been attacked rather more speedily than the other three.]

3. As to the development of the vaccine pocks:—

Development of pocks where inflammation commenced in course of first week:—

Apparently normal, 57, 59, 60, 94, 89, 90, 129, 133 - - - -	8
Failure of one insertion, 93, and (if four insertions were made) 85 - -	2
One pock only developed, 82, 164 -	2
No pocks developed (complete failure) 81	1
	13

Development of pocks where inflammation commenced in course of second week:—

Apparently normal, 56, 80 - -	2
Delayed and rapidly dried up when inflammation appeared, 62 - -	1
Apparent failure of two insertions (if four were made), 76 - - -	1
Apparent partial failure and partial imperfection, 79 - - -	1
	5

Development of pocks where period of commencement is unknown:—

Apparently normal - - -	1

Clerkenwell Union (August 1879).

Public Vaccination: a series of cases of erysipelas. Vaccinifer P. (Reg. No. 174), normal, 8th day; on 9th day, much inflamed, spread to right scapular region and neck.

Abscess in left axilla and inner side of forearm.

[This vaccinifer had seven co-vaccinees, only one of which seems to have gone on quite normally, so that at the vaccination day, before the events about to be narrated occurred, things were not going on quite right at the station, viz.:—

Two found much inflamed on eighth day.

One inflamed (like vaccinifer) on ninth day

One much inflamed in course of second week.

One much inflamed (but not stated when) and axillary swelling, then eczema about head and face, and a pustule of some sort on forearm. One place not healed after six weeks. (This child was used as a vaccinifer for one vaccinee (a re-vaccination) who was normal.)

One not much inflammation, but one place had not healed after six weeks and there had been small boils on thighs and back.

This is a state of affairs that might have been going on, and the infection gathering potency, for some weeks up to vaccinating day, August 12.]

On August 12; eighteen infants vaccinated arm to arm from P.

Of these eight were normal in course, but two of them subsequently had "a little eczema."

The other 10 had undue inflammation, erysipelas, abscesses, or eczema, and four died, viz.:—

E. L. F., 4 months. Arm inflamed on evening of first day. By sixth day, erysipelas extended to fingers, shoulder, and chest. Axillary abscess, and latterly abscess on back of hand. Recovered.

C. K. E., 4 months. Ill on second day. Pocks did not rise properly, but formed sores that did not heal. Ninth day, axillary abscess began. By 15th day inflammation had spread to right arm and fingers, and there was hard swelling inside left thigh and abscess in neck. Died, 19th day.

H. J. C., 3 months. Inflammation of arm began on fifth day. Pocks did not rise properly and discharged before eighth day. Extensive spread of erysipelas. Axillary abscesses. Then "eczema on thighs." Recovered.

E. R., 2 months. Inflammation of arm began on second day. By fifth day spread to shoulder and elbow. Eighth day, blebs on forearm. Axillary swelling. Subsequently "eczema on back" and soreness about labia. Recovered.

E. L. W., 3 months. Inflammation of arm began on first day. To elbow by third day; to pectoral region and shoulder by eighth day, and afterwards to right arm. Died, 17th day.

J. C. R., 3 months. 1st day restless and ill at night. Third day arm inflamed, and by eighth day to wrist. Axillary abscess formed. 21st day, right arm much inflamed, axillary glands, pus formed. Died 22nd day.

A. A. N., 4 months. Arm inflamed evening of first day, and rapidly extended to body and legs. Hard lump inside lower part of right thigh. Blebs on legs. Hands and arms peeled. Died, 14th day.

A. M. S., 3 months. By eighth day arm inflamed from shoulder to elbow. Vesicles matured and healed in due time. Subsequently "eczema came out over body, limbs, and head." Recovered.

F. H. R., 3 months. Ill on fifth day. Inflammation spread down to fingers and to left scapular region. Subsequently to right arm and hand. Recovered.

W. G. M., 3 months. By eighth day much inflamed. "Eczema came out over body and limbs." Recovered.

Vaccination station a crowded doubtfully wholesome little room. Public Vaccinator says a dirty offensively smelling woman brought a child, whose face was covered with scales, to be vaccinated on August 12. He sent her away. He thought it possible that she might have spread infection. (Less likely, I think, than explanation suggested above.)

The vaccinating instrument was a grooved lance-headed vaccinator, shutting up with three other instruments (including a curved bistoury) in one handle, and carried in a case in the pocket. Might it not thus have become the agent of infection? Anyhow it is clear that the erysipelatous contagium was imparted at the time of vaccination.

Blandford Union (September 1883).

Public Vaccination; erysipelatous inflammation after vaccination, to which Inspector's attention was called by the Public Vaccinator himself, who was careless in observance of Board's Instructions.

Three children, vaccinated from P., had extensive erysipelas but recovered. They lived in separate villages. No others vaccinated on same days.

Two of these, viz., B., three months, and W., two months, vaccinated at station, arm to arm.

One of them, a private patient, was vaccinated with stored lymph from same source on the next day.

In all three cases the arm began to inflame in two or three days, and—

By ninth day whole arm involved, and there was a red blush over the children's bodies.

For two or three weeks they were in a critical condition. Watery bladders on arms.

As to condition of vesicles:—

On eighth day.—B.'s vesicles discrete.
" Private patient, vesicles discrete.
" W.'s vesicles had coalesced.

Vaccinifer, no redness eighth day, and recovered perfectly. Character of lymph, however, was doubtful, described by the P. V. as thin and plentiful (but he could not speak definitely about this).

Asked for stored lymph taken from P., the vaccinator produced three tubes (but had made no record of source of them as instructed).

Lancet used to lay on lymph rusty.

The three tubes examined by Mr. Farn had not been sealed and were all unfit for use.

One—contents dried up.
One—very little lymph, and that opaque.
One—lymph milky and containing granular matter.

All this was proof of the vaccinator's carelessness.

Stoke Newington (July 1871.—Privy Council Inquiry).

Private case; complaint by a medical man of erysipelas from N.V.E lymph, apparently more or less well preserved.

Child vaccinated on July 4th with N.V.E. lymph (tubes).

Second day, early, restless and fidgetty; afternoon, erysipelatous patch extended to acromion from punctures, where there were small conical elevations.

Increased subsequently and passed down arm, fading above. About fourth day vesicles got some umbilication, but about now were destroyed by child's restlessness. No areola had come about them.

Dr. Ballard's Memorandum.

There is no record that child died, but it was seriously ill.

Source of lymph.—P. V. who supplied it to N.V.E. says:—

Vaccinifer, with mother, always healthy.

Eighth day, when 10 tubes were taken for N. V. E. (no children having been vaccinated from it); arm "as fine as ever I saw"; "flow of lymph ample and rapid" (? too much so); not inflamed or too forward.

By 13th day, arm inflamed nearly to elbow, followed by small abscess in axilla.

Says lymph taken was pellucid and good.

Co-vaccinees, *i.e.*, children vaccinated with other tubes from same child, but by other vaccinators:—

Dr. C. says, one case successful in all five spots. Age 12 years.

"During first three days unusually violent inflammation, and from mother's account, prematurely ripened."

Eighth day, scabs drying. "Boy may have scratched himself."

Mr. B. says:—

Vaccinated seven children with the lymph. In one case only one pock rose.

In three children, "pocks rapidly came to a "head, burst and exuded a thin ichor. In "two of these three cases the children "were rendered very poorly, and, accord-"ing to the statements of the mothers, "they both had convulsive fits." All recovered.

[Nothing said about the remaining ⅔.]

Dr. C. says of another child, aged 13 months, all five spots successful:—

"There was extremely violent inflammation of the entire arm, but the quantity of lymph was so small in each vesicle on eighth day as to render it impossible to obtain a further supply from them."

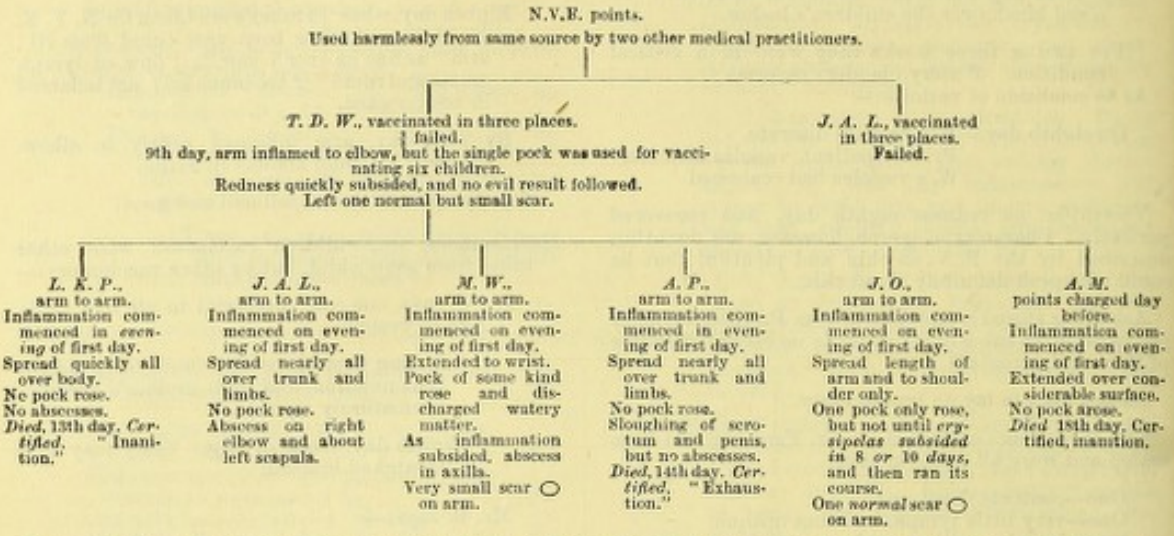
The inflammation seems to have commenced on second or third day.

Dr. Ballard's Memorandum.

Appleby (*November*, 1873).

Private Vaccination; complaint from the Board of Guardians. Inquiry as to a series of cases of erysipelas at and near Appleby, following vaccination, some fatal, due to the use of lymph from a *ninth day much inflamed* arm.

SCHEME OF GENEALOGY.



There can be no doubt that these injuries resulted from the use of the material derived from the ninth-day pock on *a highly inflamed arm*. Whether this inflammation be regarded as erysipelatous (which it probably was) or not, there was here a flagrant instance of disregard of a well-known rule of medical practice, the observance of which formed part of the instructions given by the Privy Council and Local Government Board at that time to *public* vaccinators.

It is to be observed that *no pock rose* in the three worst (fatal) cases, and in one very severe case which was not fatal.

In one of the less severe cases the mother stated that the *vaccine pock was delayed*, not appearing until the erysipelas had subsided *in early part of second week*.

Sudbury Union (*November* 1883).

Public Vaccination partly performed by an unqualified deputy; three deaths from erysipelas after vaccination.

On October 16, by the P. V.

With lymph (points charged from B. on October 9th). Doubtful if points were new. Only three children presented themselves, viz., W. E., E. E. G., and W. B., according to register, but this is not very reliable; and the P. V. states that only W. E. and E. E. G. presented themselves at the station, i.e., two (not three).

Vaccinifer B. (stated by father to have had highly inflamed arm) has four good scars, and no trace of inflammation.

Co-vaccinees, $\frac{2}{3}$ had been unduly inflamed, $\frac{2}{3}$ normal, and one was not found.

W. E.:—

Eighth day (October 23), while at station for inspection, left side of face became flushed, and that night arm became inflamed. Vesicles were opened and L. G. and G. K. vaccinated from them.

Inflammation extended rapidly up and down arm to trunk and right arm.

Died November 5, 21st day after vaccination.

E. E. G.:—

Eighth day (October 23), seems to have been normal. Vesicles were opened, and H. H. and A. M. W. was vaccinated from them.

Tenth day (October 25), restless and appeared ill, refusing food, until—

Twelfth day (October 27), by which day arm had become inflamed.

Subsequently erysipelas left the vaccinated arm, and wandered to trunk and thighs.

Twenty-second day, died.

Between the day of vaccination and the day of inspection, W. E. had been residing in a house in which the grandfather had been for about a month ill with phlegmonous erysipelas, foul ulcers, and burrowing sinuses and abscesses in leg, and had only the day before the vaccination been taken to hospital. The atmosphere of the small ill-ventilated cottage must have been infected with the taint of erysipelas during the period of vaccine development. W. E. was evidently ill with erysipelas when E. E. G. and W. E. met at the station for inspection on October 23.

What happened then was this:—On that day an unqualified deputy was sent to vaccinate:—

First, he opened W. E.'s vesicles and vaccinated L. G. and G. K.

Then immediately, without duly cleansing the lancet, he opened G.'s vesicles and vaccinated H. H. and A. M. W.

NOTE.—That W. E. was ill when at station, but L. G. was not taken ill until two or three days after having been manipulated with the lancet that must have been infected from W. E.

On October 23, vaccination performed by unqualified assistant.

The sub-vaccinees of W. E., arm to arm.

First.—L. G.:—

First and second days, fretful and feverish; $\frac{3}{4}$ insertions failed, and others did not "work well."

Before eighth day arm much inflamed; erysipelas then spread generally, and

Twentieth day, child died. Inquest. A righteous verdict—"Erysipelas conveyed by vaccination from a person suffering from erysipelas."

Next.—G. K.:—

Eighth day, $\frac{3}{4}$ failed, not inflamed, vesicles not opened.

Ninth and tenth days, "started and inflamed from top of shoulder to elbow."

Inflammation subsided in two or three days.

Note.—Possibly this child was not infected until he was in company with L. G. on day of inspection. "It was a weakly child."

Dr. Ballard's Memorandum.

The sub-vaccinees of E. E. G.

First.—H. H.:—
Eighth day and subsequently, normal.
In course of second week, lumps formed in left axilla, which subsided.
Scabs, as seen by the Board's inspector, normal.

Second.—A. M. W.:—
Not taken for inspection on eighth day, but all four insertions went well in first week.
Some time in course of second week, arm became inflamed.
Fifteenth day, mother began poulticing arm with linseed, which "brought heads off," leaving four large and hollow granulating sores, each bounded by a raised firm ring.

Note.—That these two children were vaccinated from E. E. G. with the lancet, which had infected E. E. G. herself from W. E., on whom it had been just before been used.

These children did not have erysipelas, however, but axillary swelling (of little importance) or ulceration following local inflammation, of the severity of which there is no medical testimony, and their abnormalities occurred late.

ADDENDUM D.

Notes of Cases of Vaccinal Erysipelas in which the Disease appears to have manifested itself first elsewhere than at the Vaccinated Spots or at the Vesicle.

Instances among the Tabulated Allegations.

Case.	Place of Commencement.	Date of Commencement.	Condition of the Pocks.	Remarks.
C. M. M. -	Elbow and forearm -	11th day - -	8th day, normal and punctured to furnish lymph.	In Table of Complaints. The vaccinator supplied tube lymph for xxxi. and lxv. (*infra*) and part of the batch of tubes contained pathogenic micro-organisms.
xx. - -	Shoulder - - -	4th week - -	Crusting thin and imperfect, suppurating sores later on.	Improper applications after inspection day.
xxvi. - -	Head (did not spread to vaccinated arm).	10th day - -	Normal but without areola on 8th day.	Cause not ascertained. Probably unconnected with vaccination.
xxxi. -	Forearm - - -	By 8th day -	On 8th day, thin scabs in place of vesicles and no redness.	Probably due to infective lymph (*see* C. M. M. *supra*).
cxii. - -	Trunk and scalp - -	8th or 10th day -	One of two punctures failed. One about time of redness became inflamed and gangrenous.	Bad nursing. Filthy shield used in 2nd week.
cxvi. -	Shoulder (on 8th day there had been redness from shoulder to elbow which, however, soon subsided).	End of 3rd week when spots had healed.	One of three punctures failed.	Erysipelas rife in district. The vaccinifer had apparently similar late attack.
cxxiii. - -	Shoulder - - -	10th day - -	Normal on 8th day -	Unwholesome surroundings and applications. Vaccinifer's arm normal on 8th day, became subsequently inflamed.
cxxviii. -	Anterior fold of axilla -	12th day - -	8th day normal - -	Exposed to septic infection on 11th day.
cxcii. -	Shoulder (none about pocks which scabbed normally).	14th day - -	Pocks rose slowly and were small.	Probably something wrong at time or place of vaccination as abnormalities occurred among $\frac{2}{3}$ co-vaccinees.
lxiv. - -	Top of shoulder - -	20th day - -	All went on well up to 19th day.	Probably septic infection derived from father or mother.
lxv. - -	Forearm - - -	8th day or earlier -	One of two insertions failed. On 8th day inactive superficial sore without redness at the other spot. A previous vaccination had failed.	Probably due to infective lymph (*see* C. M. M. and xxxi. *supra*). It may be worth noting that all three cases (C. M. M., xxxi., and lxv.) are stated to have commenced at the forearm.
lxvii. -	Elbow - - -	4th week (two days before fall of crusts).	Pocks healed - - -	Dirty home and unwholesome surroundings.
lxix. - -	On opposite arm - -	4th day - -	Vesicles said not to have risen properly.	Probably received infection at the place where vaccination was performed.
ci. - -	Shoulder and back -	By 8th day -	Pocks scarcely rose, but elevations rose and discharged.	Reckless vaccination by a demented aged man.
civ. - -	Inner canthus of eye on vaccinated side (no erysipelas at vaccinated spots).	8th day - -	Two of four insertions failed. On 8th day two vesicles without areola.	Vaccinifer attacked on same day (his 15th day). Both attacks probably due to the same cause, *i.e.*, the possible infectiveness of the operator or unwholesome home surroundings common to both.
cxliii. -	About a nævus on right leg (arm not inflamed).	16th day - -	Normal throughout -	Erysipelas had occurred in house 10 months previously.
cli. - -	Elbow and forearm -	10th day - -	Do. do. -	Vesicles apparently were not punctured. Erysipelas in neighbourhood and nuisances.
clvi. - -	Near the ear on vaccinated side where there was a sore place.	9th week - -	Vesicles unhealed when erysipelas commenced.	Erysipelas prevalent. Fomites possibly concerned.

Dr. Ballard's Memorandum.

Here there are 18 instances (including one in the Table of Complaints) in which post-vaccinal erysipelas did not commence at the seat of vaccination. The locality of its commencement was as follows:—

On elbow or forearm - - -	in 5	cases.
,, shoulder or shoulder and back -	,, 6	,,
,, anterior fold of axilla - -	,, 1	,,
,, opposite arm - - -	,, 1	,,
,, inner canthus of eye - -	,, 1	,,
Near the ear - - - -	,, 1	,,
On head - - - -	,, 1	,,
,, scalp and trunk - - -	,, 1	,,
About a nævus - - - -	,, 1	,,

In all but one (lxix.) of the 15 instances where it commenced about the upper extremity, eye or ear, it began on the vaccinated side of the body. The nævus attacked in cxliii. was on the right leg, and it is not stated whether the vaccination was performed, as is usual, on the left arm.

Of the 18 cases the erysipelas commenced—

On or before the 8th day in 5, viz., xxxi., lxix., ci., civ., and lxv.

In the 2nd week - - 6, viz., C.M.M. (Table of Complaints), xxvi., cxii., cxxiii., cxxviii., and cli.

,, 3rd ,, - - 4, viz., cxcii., lxiv., cxliii., and cxvi.

,, 4th ,, - - 2, viz., lxvii. and xx.

,, 9th ,, - - 1 ,, clvi.

It can scarcely maintained in the face of some of these cases and notably in the cases xxxi., lxv., ci., and cxii. that the first appearance of the erysipelas elsewhere than at the vaccinated spots implies that the contagium had not found admission at those spots. The preference, too, shown by the erysipelas for the vaccinated side of the body, may perhaps be regarded as tending to corroborate this view.

I find also among some old inquiries into alleged erysipelas from vaccination four similar incidents, viz., in the Warrington series, where No. 62 (register number) commenced on the 9th or 10th day at the forearm; No. 79 on the 11th day behind the left shoulder, and No. 81 on the 4th day at the bend of the elbow. In a case at Wandsworth the erysipelas commenced on the 7th day behind the left mastoid process.

EDWARD BALLARD.

25 August 1893.

III.—Reports on inquiries, made on behalf of the Commission, into cases in which death or non-fatal injury had been alleged or suggested to have been caused by, or otherwise connected with, Vaccination; with other information as to certain cases, brought to the Commission's knowledge with a view to their investigation, into the circumstances of which inquiry was not made by medical men on behalf of the Commission.

(A.) Cases brought to the Commission's notice during the period from the 1st June 1889 to the 31st July 1893.

Case 1, reported to the Commission by the Home Office.*

Case of E. M. C.: report to the Commission of Dr. Thomas Barlow on the family of Mr. A. C., the father of E. M. C.

At the request of the Royal Commission on Vaccination, I examined the members of the above family, especially in regard to the question as to whether there was any evidence of acquired syphilis in the parents or inherited syphilis in the children.

The family was brought to my house on the 5th August 1890, and examined by me on that date.

1. Mr. A. C. (father), aged 33, game-keeper. He states that he has had good health all his life and has never required medical advice. Has lived at ————, ————, ————, ————, Yorkshire villages. Has not lived in any large town. He affirms that he has not had intercourse with any other woman than his wife before or since marriage.

   Condition when examined by me on the 5th August 1890:—He is a healthy man and of good development. There are no scars on the prepuce or glans penis or scrotum. There are no scars in the groins. The glands can be felt in the groins to a slight extent.

   There are no scars around the anus, but there is a little thickening of the skin there, as though from slight chronic eczema.

   The skin of the trunk shows a little miliaria, probably the result of excessive perspiration, to which he appears to be subject.

   The throat, head, eyes, bones, and viscera, so far as they admit of examination with the patient quite stripped, are natural.

Conclusion:—There is no evidence of syphilis whatever.

2. Mrs. C. (mother), aged 30 years 2 months. History given by her:—She had good health as a girl. She lived at ————, near ————, until her marriage. Lives now at ————. She has had no miscarriages, has been pregnant three times and has gone her full time in each pregnancy. The first child was born 12 months after marriage and was suckled 12 months. The second child was born 2 years 10 days after the first. Shortly after her second confinement she got a "white leg" which kept her ailing for three months.

   About Christmas, 1887, Mrs. C. suffered from a white discharge from the front passage. She had no sore place at all and did not suffer any pain with the "whites." At that time her periods were too frequent, occurring once a fortnight. Otherwise she states that she was well. She is positive that she had no rash on her body. She consulted Dr. R., of ——, about the white discharge.

   He did not make any special local examination, but ordered a lotion to use as an injection. Says that the doctor gave her a dozen powders to dissolve in water and that she used them for one week. She had also some medicine to take internally, but this she only took twice. She does not remember taking any pills or powders.

   She affirms that the white discharge ceased in about a fortnight and did not return. Although at times her throat has troubled her she does not remember being troubled with it at that time.

   Her third child, E. M. C., was born on the 17th December 1888 (about 12 months subsequent to above-mentioned incidents). She was born at full time. The child had thrush in the mouth and around the back passage when one week old, and this continued for 14 days. The mother affirms that there was no running from the nose and that the child was not stuffy.

   This child was the subject of the vaccination inquiry at ————. It is only necessary here to give the mother's statement. The child was vaccinated when 15 months old. Three insertions were made on the shoulder. She states that the lymph was taken from a glass tube. Only two places took.

   On the 8th day two pimples appeared and in few days afterwards small watery blebs formed which ran into one large sore. On the same side (the right) there occurred a breaking out about the ear and the eye. This was about 14 days after the vaccination.

   Condition of Mrs. C. when examined by me on the 5th August 1890:—

   A fresh-complexioned, fairly healthy woman. Is the subject of chronic enlargement of the tonsils, and has lost several teeth. There are no signs of old cicatrices about throat, mouth, or tongue. No eye trouble. The body examined throughout. The skin is free from any rash or pigmentation.

   The bones, so far as they can be examined, are natural. At Mrs. C.'s special request, and of the lady friend accompanying her, the genital organs were examined; no sign of any cicatrix about the genitals could be seen, and in particular no enlarged glands could be found in the groins. There are some enlarged veins in the right calf.

Conclusion:—I see no evidence of syphilis in Mrs. C., nor does the history of the third child E. M. C. suggest to me that it was the subject of inherited syphilis.

3. E. C., aged 8 years 5 months, the oldest child of the family. History given to me by the mother:—This was a full-term child. She was free from rash in her infancy, and did not suffer from cold in the nose. She was suckled 12 months. During the last five years she has suffered from occasional crops of heat lumps which have itched a great deal, so that the child has scratched herself considerably, and often scratched off the heads of the heat lumps.

   Condition as seen by me on the 5th August 1890:—A well-developed, fresh-complexioned

* *The Commission examined three witnesses as to this case. See minutes of evidence of Mr. Edward Ward, M.B., Mr. Harry Littlewood, F.R.C.S. and Mr. Alfred George Barrs, M.D., appended to the Commission's Sixth Report, Questions 23,574-912.*

An inquiry was also made into the case by a Medical Inspector of the Local Government Board. The case is the same as that numbered as Case XC. on page 32.

child. The nose is well formed. The eyes natural—free from iritis or choroiditis.

There are no scars about the mouth. Teeth, several carious. The permanent upper median incisors are notched, but *not* in a way characteristic of hereditary syphilis.

Tonsils enlarged, but showing no sign of ulceration. Tongue and palate natural. Lymphatic glands in the neck enlarged, probably as result of enlarged tonsils and carious teeth.

Trunk.—There are a few small ill-defined scars on the skin of the trunk. They are not typical of anything; they probably correspond with the remains of the recurring itching eruption described by the mother.

No scars about genitals or anus.

No thickening of tibiæ or other bones.

Conclusion:—There is no evidence of inherited or acquired syphilis.

4. R. W. C., aged 6 years 5 months.

History.—Full-term child. Suckled 13 months. No illness.

Condition when seen by me on the 5th August 1890:—Healthy boy. Tonsils a little chronically enlarged. The *milk* teeth are carious, and there is a gum-boil present. Permanent upper median incisors not yet cut. There are no scars about the corners of the mouth. The nose natural. Tongue and palate natural. Eyes natural, free from iritis and choroiditis. Viscera natural. There are no scars about nates or genitals. No rash on the body. Testicles natural. Bones natural.

Conclusion:—There is no evidence of acquired or inherited syphilis.

THOMAS BARLOW, M.D.

Case of E. M. C.: supplementary report to the Commission of Dr. Thomas Barlow.

I beg to report to the Royal Commission on Vaccination the results of my visit to —— and the neighbourhood made on the 7th March 1891, with a view to the possible further elucidation of the case of the infant of Mr. C., of ————. I gathered that the chief reason of my being sent to ———— was the ascertainment of any further evidence that might be forthcoming on the possibility of syphilitic infection as a factor in the blood poisoning of the infant in question; it was therefore to this point that I specially directed my investigations.

I first visited the family of Mr. H. R., of ——, ——. J., the youngest child of this family, was the alleged vaccinifer in the case of the infant E. C.

J., I learnt, had been vaccinated on the 15th March 1889, when about six months old. Three punctures were made and they all took, and, according to the statement of the parents, ran a healthy course. The sores were all healed in one month's time. Lymph was taken from them at the usual time, and eight or ten tubes were filled. The parents further stated that J. had been suckled for 12 months, and that she had had good health throughout. She had been free from rash or "cold in the head." I found the child healthy and well developed, free from any specific sign. There were no scars about the mouth or anus. The nose and limbs were natural. There was nothing to justify a diagnosis of congenital syphilis in the child's condition. I examined the six other living children of this family, viz.:—

M., aged 16 years.
H., aged 12 years.
T., aged 9 years 11 months.
C., aged 7 years.
M., aged 6 years.
E., aged 3¾ years.

These children, I was informed, had been all born at full term, and they had not suffered from rash or cold in the nose in infancy. I failed to find in any of them any specific sign, and I draw attention to the fact that the age of five of them allowed me to note the condition of the permanent upper medium incisor teeth, which are test teeth, in regard to congenital syphilis. These teeth I found normal.

I was informed that three children born at full term had died as follows, viz.:—One aged 10 years 7 months of consumption of the bowels; one aged two years seven months of croup; one aged one year of whooping cough and bronchitis.

Since J. Mrs. R. has had one child born dead. She believed it to be an eight months' child, and she attributed its premature birth to a bad fall, which she had from a chair whilst attempting to lift something from a shelf. She had had no previous miscarriages.

Mr. H. R. (father) appeared to me to be a healthy man. His skin was clear, throat natural, limb bones natural. Of Mrs. R. I was not able to make a very thorough examination. She seemed somewhat pale, but her skin showed no sign of rash or scar and her throat was natural.

I subsequently visited Dr. M., of ————, as he had attended Mrs. R. on the occasion of her confinement with the still-born child above referred to, which took place on the 8th July 1890. Dr. M. informed me that he considered the fœtus was of the age of six months, but that he had not examined it carefully. He also stated that he had observed some opaque patches on the placenta, which he attributed to syphilis at the time; but I ascertained that the placenta was not subsequently investigated, nor was any post-mortem examination made of the fœtus. Mrs. R. made a good recovery.

Dr. R.'s vaccination book was in the custody of the Local Government Board, but from him I obtained the information that the following children were vaccinated from lymph obtained in glass tubes from J. R.:—

F. O.,
R. W. J.,
E. H.,

in addition to the infant who was the subject of the inquiry, viz., E. M. C.

The child R. W. J. and his parents I found were away from home, but F. O. and E. H. I examined.

F. O., aged two years two months, now living at ————.

This child was vaccinated on the 23rd March, and according to the parents, the course of the vaccination was normal. I found three normal cicatrices. The child was healthy. There were no scars about mouth or anus. The nose, limbs, and skin were natural.

The other child, aged four years, and the parents were healthy.

E. H., aged two years three months, now living at ——, ——, ——.

This child was vaccinated on the 23rd March 1889. The parents stated that the "child had as nice an arm as "any child." It was all right in a month. I found that there were two normal cicatrices on the shoulder. The child was healthy, and free from any specific sign. I examined a child born subsequently aged one year, M., and also the parents, and found them healthy.

I also visited M. E. B., a child aged two years two months, who had been vaccinated on the 8th March 1889, and found she had three normal cicatrices, with a history of recovery in one month. The child was healthy in every respect, and the brother and two sisters whom I examined were healthy, and free from specific sign.

From the foregoing report, it will be seen that I failed to obtain any evidence of syphilis in the children examined by me, viz., (1) in the alleged vaccinifer J. R., and her brothers and sisters; (2) in two children F. O. and E. H., who in common with the infant E. M. C. were probably vaccinated from J. R.; (3) in the child M. E. B. who was vaccinated one week before J. R. Conclusions.

I also recall to the memory of the members of the Royal Commission that in my previous report on the family of Mr. C. I was unable to find any evidence of syphilis in the two living children submitted for my investigation or in the parents, Mr. and Mrs. C.

The observations communicated to me by Dr. M. of ————, with respect to the last pregnancy of Mrs. R. do not appear to me adequate to establish the existence of syphilis as a factor; and even if such were established it would be posterior to the case of J. R., the alleged vaccinifer, whom I consider to be entirely free from any sign suggestive of syphilis.

The possibility of communication of syphilis to the infant E. M. C. by the vaccinator himself was carefully investigated by Dr. B. when Mr. T. was still resident with Dr. R., and was negatived. Mr. T.

(the vaccinator) has left Dr. R. some months ago, and I am therefore not able to investigate this point personally.

But so far as my own observations go, based on examination after a considerable interval has elapsed from the fatal illness of E. M. C., it will be seen from the above remarks that I am unable to find any evidence as to how syphilis was conveyed to her.

Whilst accepting the description of the symptoms of the infant E. C. as given by the able surgeons of the —— Infirmary, I would submit the question, *Is there no explanation other than syphilis possible to account for the blood poisoning from which the child suffered?*

There were some facts which I learned from Dr. R. about the house in which Mr. C. resided when E. M. C. was born, which facts I think deserve attention.

Mr. C.'s immediate predecessor in the gamekeeper's lodge which he occupied was a man H. This man had repeated illnesses in the house: diphtheria, scarlet fever, diphtheria again, and chronic obstinate sore throats. The wife (Mrs. H.) did not recover from a protracted attack of bad sore throat until she was removed to ————. The family of H., I was informed, was obliged finally to leave this house on account of the bad throats. Some defects were pointed out and remedied with respect to the drainage and the ashpit, but it was also noteworthy that in the immediate proximity of the house there were a great many dogs kept, besides poultry.

During Mr. C.'s residence at this house, where the infant E. M. C. was born, Dr. R. informed me that he had attended Mrs. C. for bad throat, though not of the severe character that the predecessors had suffered from.

I recall in this connexion that in my report on the C. family I noted that mother and children were the subject of marked chronic enlargement of tonsils.

On the occasion of my visit to ———— I went to C.'s house near ————, but found the family away and the house locked up.

I found nothing insanitary in the immediate surroundings.

The above statement, obtained in conversation from Dr. R., referred, however, to a state of things which had existed more than two years previously. I submit that the history of serious recurrent throat complaints in that house deserves to be considered as having a possible bearing on the unhealthy course of the vaccination in the infant E. M. C.

THOMAS BARLOW, M.D.

Case of E. M. C. Copy of the depositions taken at an Inquest held on the body of E. M. C., and of the verdict returned by the Jury.

The Information of *E. A. C.*, taken upon Oath the 3rd Day of July in the year of our Lord One Thousand Eight Hundred and Eighty-nine, at the Township of —— in the Borough and County aforesaid, before me, J. C. M., Her Majesty's Coroner for the said Borough, touching the Death of E. M. C. then and there lying Dead.

Who Saith,

I am the wife of A. C., a game-keeper of ——. The deceased is my daughter, aged 6 months. She was vaccinated on the 26th day of March, and before vaccination was a healthy child. She had three cuts on the right arm; two took. Dr. R. and his assistant attended her. It did not take the ordinary course. She had a bad ear and eye. On the first day of June, I took the child to the General Infirmary at Leeds. I visited it frequently. The child was very much disfigured. I and my husband are both healthy. We have two other children; both are perfectly healthy.

Taken and Sworn before me, E. A. C.
J. C. M., Coroner.

The Information of *Harry Littlewood*, taken upon Oath the 3rd Day of July, &c..

Who Saith,

The deceased was received at the Leeds General Infirmary on June 1st, and remained until the 21st June. She was re-admitted on the 26th day of June and died on the 1st day of July.

In my opinion the cause of death was blood-poisoning following vaccination.

HY. LITTLEWOOD.

Taken and Sworn, &c.

The Information of *E. A. C.* taken upon Oath the 10th day of July, &c.:

Who Saith,

I know of nothing that could have contaminated the child. I did not use any dressing before the doctor saw her, and used nothing after except what the doctor prescribed. I believed up to yesterday, that heifer lymph had been used. No one nursed the child but myself.

E. A. C.

Taken and Sworn, &c.

The Information of *C. A. R.*, taken upon Oath the 10th day of July, &c.:

Who Saith,

I am the wife of H. R., a currier of ——. I have a child named E., 11 months old, it has been vaccinated on the 15th March last. Mr. R.'s assistant performed the operation. Three punctures were made; they all took. The child went on all right after vaccination. The matter was taken from it on the 22nd March by Mr. T. It was vaccinated at Dr. R.'s surgery and the matter taken from it there. I have had nine children. All have been vaccinated. The vaccination took all right in this case. No one was present when the matter was taken from her. The lymph was taken on needles. My health is not affected at all. Neither is my husband's. I had no sore about me at the time. I nursed the child myself, and kept it free from contact with sores. I did not know how the lymph taken from my child was used. Dr. D. is my family doctor. I was never attended by a doctor for any illness except confinements. I have had nine children; three children dead; first, 13 months old, from Croup; second, 10 years, died from Bronchitis; third, 13 months, died from Bronchitis and Whooping-cough. All my children are healthy. The child has now perfectly recovered.

Recalled.—I have never had a still-born child. All the births have been natural.

her
C. A. × R.
mark.

Taken and Sworn, &c.

The Information of *H. J.*, taken upon Oath the 10th day of July, &c.:

Who Saith,

I am the wife of S. J., a Farm Bailiff of ——. The name of my child is R. W., aged five months. The child has been vaccinated on the 23rd March last by Dr. R.'s assistant. My child went on all right. The lymph was taken away the week following at my house. The child is now quite well. I have had no cause for anxiety since the operation.

H. J.

Taken and Sworn, &c.

The Information of *S. H.*, taken upon Oath the 10th day of July, &c.:

Who Saith,

I am the wife of J. J. H., a Coachman, of ——. I have a child called E. It was vaccinated by Dr. R.'s assistant on 23rd March last. The vaccination progressed all right. The lymph was taken away seven days after. The child is now quite well. No sign of illness from vaccination. I made no inquiry as to what lymph was used.

S. H.

Taken and Sworn, &c.

The Information of *A. T.* taken upon Oath the 10th Day of July, &c.:

Who Saith,

I am an assistant to Dr. R. I have been an assistant for six years. I have finished my curriculum at the Glasgow University and Anderson's College and Royal Infirmary Medical School, but have not qualified. I have assisted in vaccination cases before. I remember vaccinating Mrs. R.'s child. I knew nothing about the history of the family at the time. The case was brought to the surgery. The practice of vaccination is done half-yearly. I generally inquire as to the condition of the family before using the lymph off a child. I consulted Dr. R. as to the condition of the child before using the lymph. I had no hesitation in taking the lymph. I took the lymph by capillary tubes. I used 9 or 10 tubes. Dr. R. was going in and out of the surgery all the time. There was one other child in the surgery, but I took none from it. I took lymph from one child on the 15th March, and used about 9 or 10 at that time. I took some lymph from three children on the 30th March, including H.'s and J.'s. Each case was separately put on one side in a glass tube. I put no distinguishing mark on the tubes, they are kept in a common drawer. I am quite positive I used the lymph from Mrs. R.'s child. Lymph will keep good three months. The tubes had not accumulated in the drawer. I had three or four large tubes each containing smaller ones on the 23rd March. When I took the lymph from Mrs. R.'s child it did not bleed nor weep. I had not exhausted the arm. I did not drain it of lymph. I never exhaust the place. I saw the deceased after vaccination on the 11th April at its own residence. Her arm was considerably inflamed and was suffering from contitutional disturbances in consequence. This was the first time I had noticed any constitutional disturbance. The child had furred tongue, feverishness and acute inflammation of the arm. I made three punctures on the right arm. There was a cluster of about six vesicles on the arm. That was an unnatural state to find. On finding the child in that condition, I took some dressing for the arm as I had been informed before of the child's condition. I dressed the child's arm with carbolic oil. I dressed the arm myself. The parents of the child had previously dressed it with olive oil on calico. I found no fault with their dressing. I next saw the child on the following day; the child's arm was still inflamed. Inflammation had increased. Nothing further was noticeable. I repeated the same dressing. I next saw it on the 16th March. The inflammation was spreading. No ulcer was formed. The vesicles had dried up. There was a scab, it appeared to be a dry one. I did not test it with my finger. I painted it with nitrate of silver under the directions of Dr. R. I next saw it on the 21st. The inflammation was then subsiding, and the constitutional disturbance had abated. I never had any suspicion as to the nature of the slough at that time. That was my last visit. I saw it on the 21st April at the surgery. They had in the interval been applying their own remedy. I again saw the child on the 21st May at the surgery. I noticed that the arm appeared healthy. There was a trace of dried up pustules on the eyebrow and behind the ear. I thought that was irregular, and that there had been absorption of decomposed tissue from the slough which produced blood poisoning. I did not attend the child any further. The cause of the inflammation might have been caused by the irritation of dress or insanitary condition of dwelling. I thought it was erysipelas caused by these surroundings.

(*By the Jury.*) The lance was previously used for vaccination. I use an ordinary lance.

(*By Coroner.*) I had no arrangement made as to the using any particular kind of lymph except that Mrs. C. said she supposed it would be from a heifer. I evaded the question and said it was pure lymph. Nothing further transpired.

A. T.

Taken and sworn, &c.

The Information of *T. R.*, taken upon Oath the 10th day of July, &c.:

Who Saith,

I am a surgeon practising at ——, and a Doctor of Medicine of Edinburgh University, a Licentiate of the Royal College of Surgeons, Edinburgh, and a Licentiate of the Royal College of Physicians, Edinburgh. I have been in practice for 35 years in ——, and have had considerable experience in cases of vaccination. I should think I have vaccinated not less than 10,000 children. I change the lymph frequently. If a person is specially anxious to have calf-lymph I send for it. It is a common practice to vaccinate children off children. I have known the R. family for years, the parents are quite healthy. I have never attended them professionally, but have vaccinated all their children. I remember the child R. being vaccinated and the lymph being taken from it. The tubes are sealed and put in larger tubes, and numbers put on the tubes to distinguish them. I did not see F. M. C. vaccinated. On the day previous to its being vaccinated, I should have met her at —— on the 25th. I could not get to ——, and my assistant was sent next day to attend. On the 15th April, I visited the child at the parents' house. It was suffering from inflammation around the pock-marks, not very acute. Nothing further struck me. I prescribed nitrate of silver to be painted over it. I found no fault with their dressing. No inquiry was made of me as to what lymph was used. The next time I saw it, it was brought to my surgery. The scabs were then dried up. I prescribed again for it. I saw the child every two or three days up to its removal to Leeds. I think it would have got well if persevered with. It was at the parents' instance that the child was removed to Leeds. I never saw the child again.

T. R.

Taken and Sworn, &c.

The Information of *Harry Littlewood*, taken upon Oath the 10th day of July, &c.:

Who Saith,

I am the House Surgeon at the Leeds General Infirmary, and a Fellow of the Royal College of Surgeons, England, and Licentiate of the Royal College of Physicians, London. The deceased was under my observation from its admittance up to its death. In my opinion the child died from syphilis consistent with its having arisen from vaccination.

Hy. Littlewood, F.R.C.S.

Taken and Sworn, &c.

The Information of *Edward Ward*, taken upon Oath the 10th day of July, &c.:

Who Saith,

I am a Bachelor of Medicine and a Bachelor of Surgery of the University of Cambridge, and Member of the Royal College of Surgeons, England, and Honorary Assistant Surgeon at the Leeds General Infirmary. E. M. C. came under my care as an inpatient of the Infirmary on the 1st day of June last. The child was suffering from deep ulceration of the right arm on the outer surface, between the shoulder and elbow, and extending almost completely round to the inner side. The right ear was affected by an ulceration of a similar character. There were also moist sores on and around the right eyelids, and a scaly rash about the buttocks and external organs of generation. These were of a well recognised and undoubtedly syphilitic nature. The ulceration of the arm and ear also presented features which are almost conclusive of syphilis. The history which was given of the illness was to the effect that the child had been perfectly healthy up to the age of 15 weeks, when it was vaccinated. A week afterwards a red mark appeared at the site of the vaccination. At the end of a fortnight a blister formed over the spot. Shortly afterwards a large number of spots developed around the first one. These spread and joined together, and made a large ulcerating surface. A month after vaccination the ear began to ulcerate, and two days later the sores appeared round the right eye. I am of opinion that the syphilitic affection was acquired and not congenital—

1. Because it did not run the usual course of congenital syphilis.
2. Because there is no evidence in either parent of any taint of syphilis recent or remote.
3. That syphilis in the parents would in all probability be recent, assuming the infection to come from them, seeing that the previous children are perfectly healthy.

The fact of other children being vaccinated from the same subject and remaining healthy is no argument against its being a tainted source. Experience and statistics show this most clearly.

The case came under my care since its admittance, and received my personal attention almost daily.

Regarding the case as one of gravity and importance the child was seen in consultation by the other surgeons of the infirmary, who concurred in my opinion, and as a result of that consultation it was placed under treatment for syphilis. There was very rapid improvement for three weeks, when on June 21st, at the urgent request of the parents, the child was removed from the infirmary. On June 26th it was brought back much worse. The whole of the right buttock and a large area over the inner end of the left collar bone were much inflamed.

Eventually almost the whole of the buttock fell into a condition of mortification. A similar patch appeared on the inner side of the thigh and the left eyelid, the mouth became sore, and the child sank and died on July 1st. I am of opinion that the death was the result of vaccination; that the child was suffering from syphilis, and that the weight of evidence is strongly in favour of the theory that the syphilis was acquired and not congenital.

EDWARD WARD.

Taken and Sworn, &c.

The Information of *Alfred George Barrs*, taken upon Oath the 10th day of July, &c.

Who Saith,

I am Doctor of Medicine of University of Edinburgh, Member of the Royal College of Physicians, England, and Honorary Pathologist of the Leeds General Infirmary and Assistant Physician at the Leeds General Infirmary.

I did not see the deceased during life. As pathologist of the institution I made a post-mortem examination 24 hours after death. The body was well nourished. Externally I found a curious translucent idematous appearance of the skin and subcutaneous tissue of body generally, with distinct earthy tint of the surface. No actual pitting on pressure. Occupying the outer and anterior aspect of the right upper arm, measuring 3¼ inches or thereabouts in its longest diameter (vertical), and of sufficient width at its widest part to almost encircle the limb, is an excavated sore covered with a thin waxy-looking scab. In its central parts the sore extends so deeply as to leave little covering for the bone, while at its margins it involves the skin only. Spreading from the upper margin of the ulcer there is a very distinct stain of the skin, clearly the remains of an eruption at this point. There are indications of sores about the eyelids and also in the right ear. On the right buttock there is a ragged sore of considerable size with undermined edges, and considerable destruction of the soft parts. Upon the skin in the neighbourhood of the arms and also upon the external genitals there are several small sores and some stains of a previous ulceration. On making the ordinary post-mortem incision there was found in the sub-cutaneous tissue of the neck, immediately above the sternum, a fair-sized abscess containing some salmon coloured matter and some shreds of dead tissue. All the other parts of the body and the internal organs showed no naked eye-evidence of disease. My opinion is that the child died from syphilis. I have heard the evidence in Court, and in my opinion the syphilis was acquired. It is possible for persons to be exposed to syphilis, and for some to take it and others not

ALFRED G. BARRS.

Taken and Sworn, &c.

The Information of *Arthur Ferguson McGill*, taken upon Oath the 10th day of July, &c.

Who Saith,

I am a Fellow of the Royal College of Surgeons, Honorary Surgeon to the Leeds Infirmary, and Professor-Surgery in the Yorkshire College. I saw the deceased in consultation on June 5. I have heard the evidence given by Mr. Ward, and I agree with it. The child died from syphilis, which was most probably the result of vaccination. The period of incubation was shorter than it often is, but is quite compatible with the facts of the case. No blame necessarily attaches to the vaccinator in cases of this description, as the child from whom the lymph is taken may appear to be perfectly healthy although syphilitic. I do not think that the child produced in Court was the vaccinifer in this case.

By a Juryman. It is possible that syphilis was inoculated into the vaccine sore subsequent to vaccination. Numbers of children can be vaccinated at the same time, and some may take the disease and others escape.

A. F. MCGILL.

Taken and Sworn, &c.

Verdict.

That the said E. M. C. died at the General Infirmary, Leeds, aforesaid, on the 1st day of July 1889 and so the Jurors aforesaid, upon their Oaths, do further say that she died from syphilis acquired at or from vaccination, and the Jurors aforesaid do further say that the said E. M. C. was a female person of the age of seven months, and a daughter of A. C., a Gamekeeper of ——.

And the Jury also express the opinion that when a parent requests calf-lymph, it is the duty of the medical man performing the operation to supply it if obtainable, or to explain to the parents his inability to comply with their request.

CASE 2, REPORTED TO THE COMMISSION BY THE FATHER OF THE CHILD.

Case of S. R. McC. An inquiry was made into this case by a Medical Inspector of the Local Government Board; and an analysis of his report is given on page 27, where the case is numbered as Case LXXIII.

CASE 4, REPORTED TO THE COMMISSION BY THE FATHER OF THE CHILD.

Case of G. E. B. An inquiry was made into this case by a Medical Inspector of the Local Government Board; and an analysis of his report is given on page 6, where the case is numbered as Case X.

CASE 5, REPORTED TO THE COMMISSION BY Mr. J. H. LYNN.

Case of E. E. B.

E. E. B. was brought to the office of the Commission on the 20th November 1889, *and there examined by Sir James Paget, Sir Guyer Hunter, Mr. William Scovell Savory, Dr. John Syer Bristowe and Dr. William Job Collins, members of the Commission. The following statement was made to the Commission.*

(Sir James Paget.) This case was that of a child with every appearance of moderately good health, which was vaccinated at six months old on the 4th of October last by the Public Vaccinator. All went on well for the first fortnight, but then ulceration began beneath three of the five vaccine vesicles, and extended so as to include the space occupied by all the three, producing an ulcer of about three quarters of an inch in its chief diameter, and extending through the thickness of the skin. The ulcer was now in progress of healing, and the swelling of the arm around it had greatly diminished. The child's general health appeared to be undisturbed. The ulcer did not present the appearances of a syphilitic sore, though Dr. Collins thought that it would be right to watch the course of the case for any changes that might ensue later in its progress. The child appeared to have been in good health up to the time of vaccination, but it deserves notice that it had been fed on condensed milk from a few days after its birth. It is desirable to mention that the report which was brought with the child as to the condition of the ulceration, being made by a person not familiar with the medical examination of ulcers, stated that the ulceration extended nearly to the bone. Doubtless it appeared deeper when the arm was much swollen than it did to-day; but, in fact, it extended only through the thickness of the skin and not nearly to the bone. The case may be regarded as one of an untoward consequence of vaccination, but not such an one as is likely to lead to any permanent injury to the health of the child.

Copy of a letter subsequently received by the Commission from the Guardians of the —— Union.

SIR, December 11, 1889.

I am directed by the Board of Guardians to forward to you for the perusal of the Royal Commission on Vaccination the accompanying copy of a report made at their request by Dr. C., the Medical Officer and Public Vaccinator for the —— district of the Union on the case of the child E. E. B. who suffered from sloughing after vaccination. The Board understand that the case has already been represented to the Commission by certain persons interested in the abolition of compulsory vaccination; the Guardians therefore think that in order that the Commission may be able to form a correct opinion upon it they should be in possession of the report of the officer who had charge of the case.

I have, &c.,

The Secretary, M. R. S.
Royal Commission on Vaccination.

(*Enclosure.*)

Re B.; copy of Dr. C.'s report to the — —- Board of Guardians.

GENTLEMEN, November 25, 1889.

I beg to furnish you with a report on the case of E. E. B., aged six months, who is suffering from ulceration of the arm after vaccination. He was vaccinated on Friday, October 4th, the first day of the last public vaccination at———. On the preceding Friday two children in good health and of healthy parentage were selected and vaccinated with calf lymph, supplied to me from the National Vaccine Establishment. The operation in each case was successful, all the vesicles resulting from it being of a perfectly normal character. From one of these children, the child B and nine others were vaccinated, with the result that when brought up for inspection the following week, the arm in each case presented the appearance of vaccination running a most satisfactory course. All the cases went on to a favourable termination, except that of E. B., who about a month later was brought to me again. I then found deep ulceration of a sloughing character at the spot where the child had been vaccinated, but beyond this there was no skin affection or other ill effect observed. When these facts are duly considered, that the child was vaccinated from normal lymph taken from a healthy child, that nothing wrong was observed when he was brought up for inspection, and that the nine other children vaccinated from the same source suffered no bad consequences, I think no other conclusion can be arrived at than that the extensive ulceration which followed in this case was due, not so much to the vaccination as to conditions peculiar to the child, or to some want of proper care in the management of him. The sloughing character of the sore showed a want of constitutional vigour on the part of the child, and as a possible cause of this condition it should be stated that he had been brought up on condensed milk. While fully recognising the utility and convenience of preserved milk for occasional use, I am strongly of opinion that no infant can be exclusively fed on it without the risk of serious damage to its health. The child is now supplied with fresh milk, and I am glad to say the arm is rapidly getting well. Slight ulceration of the skin not unfrequently follows the vaccination, especially when the natural healing process is mischievously interfered with; but its occurrence to the serious extent found in this case must be exceedingly rare, as I have never seen it before, although many thousands of vaccinations have come under my observation, and it appears to me that such an exceptional case, although a matter of regret, no more furnishes an argument against the judicious employment of vaccination than the disastrous effects that occasionally follow the administration of chloroform and ether provide us with a valid reason for giving up the use of those priceless blessings.

I am, &c.,

To the Board of Guardians. J. C.

CASE 6, REPORTED TO THE COMMISSION BY Mr. J. H. LYNN.

Case of W. H. H.

W. H. H. was brought to the office of the Commission on the 20th November 1889, *and there examined by Sir James Paget, Sir Guyer Hunter, Mr. William Scovell Savory, Dr. John Syer Bristowe, Dr. William Job Collins, Professor Michael Foster and Mr. Jonathan Hutchinson, members of the Commission. The following statements were made to the Commission.*

(*Sir James Paget.*) This is a child of four months old with parents in moderately good general health. It was vaccinated five weeks ago with the calf lymph at Lamb's Conduit Street. All went on very well till the end of the month, and there are now the remains of five good vaccination sores. Nothing untoward has happened with the sores, they seem to have passed through their ordinary course; but seven days ago inflammation of the skin began just above the sores, nearly on the shoulder, which spread over the arm down to the elbow; and this inflammation has been followed by the formation of a large abscess in the arm-pit, which abscess has now attained a considerable size, and is ready to be punctured and discharge. The child's health has suffered in this way severely for a week or more, but it has not done any material damage to the general health, and there is no reason to doubt that when that abscess is opened and discharged it will heal up, and probably without any material damage to the general health. It may be well to mention that there are spots on the lower part of the body which Mr. Hutchinson is disposed to think indicate a syphilitic inheritance in the child, and he would hold that if so the child was more liable than an average healthy child would be to the recurrence of trouble such as it has had to bear; but I think the rest of us doubt, or even more than doubt, whether there be any syphilis in the child. There is, however, that question which might still arise, and which may, perhaps, be solved in the future observation of the child and its progress after the abscess has healed. It is the first child, and, therefore, there is no history to guide one, as when syphilis has occurred in other children of the same mother. I would only observe that it is just one of those cases in which an examination of this kind cannot be completely satisfactory, being so incomplete, as it must be. We cannot obtain the history of the family, either of the parents or of the rest of the relatives of the child, nor can we ascertain the conditions in which the child has been living, or what amount of care was taken by the vaccinator, or what, in the ordinary course of events, might have produced effects similar to this. Still it is one of the cases in which trouble has followed vaccination performed, as we may believe, with all possible care and with well-selected lymph.

(*Sir Guyer Hunter.*) I have a suspicion similar to that expressed by Mr. Hutchinson.

(*Dr. Bristowe.*) I thought the body looked suspicious, but I did not go beyond that.

(*Mr. Hutchinson.*) It appeared that the spots had been very much neglected at one stage; they had not been covered.

(*Sir James Paget.*) Sometimes it had a sleeve on and sometimes not. It might probably be said that it was taken as much care of as a large number of cases are.

(*Dr. Collins.*) I cordially agree with the statement made.

CASE 7, REPORTED TO THE COMMISSION BY MR. THOMAS KING CURTIS.

Case of I. An inquiry was made into this case by a Medical Inspector of the Local Government Board. The following is an abstract of his report:

In consequence of a complaint received by the Board from Mr. C (a Guardian), that the child of a Mr. and Mrs. I. had suffered from the effects of vaccination, Dr. Parsons, when inspecting public vaccination in the district, made inquiry into the circumstances of the case, and reports to the following effect:—

It seems that the arm was a long time (three months) in healing; a purulent discharge coming from the vesicles which formed a thick confluent crust. It was vaccinated on April 11th, 1887. When seen on the 8th

day it was doing well, and the Public Vaccinator took some lymph from it in tubes, which, however, were not used. After this the mother applied castor oil and flour to the arm which the Public Vaccinator thinks irritated it. The scabs came off of themselves, the mother says, about the end of the second week; a purulent discharge as above described, issuing and forming crusts. After continuing in this state for a long time the Public Vaccinator saw it and under his treatment it soon began to heal. There are four scars which show evidence of some loss of tissue. The child was healthy previously, and has been strong and well since the arm healed.

Dr. Parsons saw the child from whom I. had been vaccinated. The vaccine had run a normal course, leaving four typical scars; the child was healthy. He saw also one of the two other children vaccinated with I. on the same day from the same source. In this also the vaccine had run a normal course but the resulting marks were small.

Dr. F., the Public Vaccinator, appears to be careful in carrying out his instructions and Dr. Parsons thinks it likely that the ill effects in I.'s case were caused by some irritating application.

Mrs. I., Dr. Parsons states, says that Mr. C. (who is the leader of the anti-vaccination party at the Board of Guardians) had no authority from her or her husband to write about the case.

CASE 8, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of J. V. Copy of the depositions taken at an Inquest held on the body of J. V., and of the verdict returned by the Jury.

Depositions taken for our Sovereign Lady the Queen at the Coroner's Court, ———, this twenty-seventh day of December 1889, before B. W., the Deputy for H. H., Esq., J.P., Coroner of our said Lady the Queen for ———, on view of the body of J. V. (then and there lying dead) as follows:—

A. V. says:

I am the mother of the deceased, J. V., and am the wife of T. V. of———, an iron-turner.

The deceased was a small child when born, but it was healthy. I suckled him for three weeks, and then my milk left me, and I fed the child on milk and water, and gave him in addition a little arrowroot every night for the next three weeks. At that juncture I took him to Dr. E. R.'s, the Public Vaccinator. He vaccinated the child from another child. Four eruptions came out on the arm. I took my child to Dr. R.'s a week afterwards. He did not take anything from it. The child did not get any better, and these four places on the arm got into a bad wound. A wound also came on the bottom of the child, and spots on the face, and an obstruction in the nostrils. I took him then to Mr. R. S. T., the surgeon, and he examined the child. He told me to take it home and not bring it out again. He gave me some medicine to give the child. This was given to it, and Mr. T. attended the child up to the time of its death. I carried out all the instructions he gave to me. The child died on the 24th of this month, Tuesday. Mr. T. saw me first a week after I was confined of the deceased, and attended me. I was married on the 15th June this year. I never had any disease upon me. I had never been to the doctor before Mr. T. saw me. The deceased was born on the 7th September last.

T. V. says:

I am the husband of the last witness. Mr. T. told me that the child had died from the bad disorder. I have never had anything the matter with me. I am willing to be examined. I never have been under a doctor in my life.

E. L. says:

I am a midwife, and reside at ———. I attended Mrs. V. in her confinement. When the child was born there were no eruptions upon it. The child was clean and healthy. There was nothing disagreeable about the mother.

R. S. T. says:

I am a L. S. A., London, and reside at ———.

I first saw Mrs. V. a week after her confinement. She had a little inflammation of the womb, and had a chill, but she soon recovered. I was called in to examine the child about the 16th instant. It seemed to be suffering from a thrushy condition of the mouth. I told the mother to give it nothing starchy, and plenty of milk and water. I told her the child would not be able to digest arrowroot till it was a year old. About two or three days afterwards I noticed that the child began to snuffle in the nostrils, and then it began to break out over its body, and I then thought there was some specific mischief. It had been vaccinated. I could not account for the syphilis. I do not think it was hereditary. The mother said it had never been the same child since it had been vaccinated. In a day or two there was an offensive discharge from the nostrils, and when the child was dead the mother told me the arm had never healed up. I found scabs there, and there were all the symptoms then of syphilis. I am of opinion that the eruptions are the results of syphilis impregnated by the vaccination. It is often mistaken by the highest authorities. Mine is a theory that it can be impregnated from the vaccination. The child had been suffering from improper feeding, but I do not think the rapid symptoms could be developed from this. One wound was on the left buttock, and there were two on the left side of the face. The nose had an offensive discharge. I did not notice anything about the ears. The child's eyes were bad, and I ordered them to be bathed continually. In my opinion the child died from want of strength, and from the vitiated state of its blood.

E. R. says:

I am a Public Vaccinator in the employ of the Guardians of the Poor for ———.

I vaccinated the deceased child J. V., and I produce the register showing the particulars of the case. The vaccination took place on the 30th October last, and four other children were vaccinated from the same child as the deceased. I have seen these other four cases since this child V. died. They are all well, and are reported well by their parents. I have seen the deceased. I cannot see any symptoms of syphilis about the body of the deceased child. There is no darkening of the skin, and the spots I observed are not in the places where hereditary syphilis would show them. I have seen the child from whom the lymph was taken with which the deceased was vaccinated. It is a girl named L. residing with her parents at ———. Dr. C. has seen her with me twice to-day. She is free from any taint of syphilis. I have also examined all the other children vaccinated at the same time as the deceased, and they are all perfectly healthy children. I have heard no complaint about this child until to-day. I remember the child being brought to me at the end of seven days from the time it was vaccinated. It was a small child. I am of opinion that the child died from marasmus, brought on by ill-nutrition and improper feeding. When I saw the child at the end of the seven days after the vaccination the top of one of the vaccination marks was rubbed up, and the matter from the sore had spread.

A. H. C. says:

I am a registered medical practitioner residing at ———.

I have to-day examined the body of the deceased, J. V., in the ——— mortuary. On such examination I saw nothing which led me to suppose that the child was syphilitic. I have seen the child L. from whom the lymph with which the deceased was vaccinated was taken. I saw her to-day. She is about four months old, and she is a typically healthy child, and is nursed by her mother. I have seen nothing which has led me to form the opinion that the vaccination of the deceased had anything to do with its death. From what I saw after a careful external examination of the body of the child I believe that the child was much exhausted, probably as the result of bad feeding, and that on that account the vaccination sore took bad ways and sloughed, and that the child, by some inadvertence, got the matter into its eyes which set up some disease, which passed down the child's nose. I have heard Mr. T. give his evidence. I agree with him in what he says as to an affection of the eyes and nose being commonly

met with in syphilitic disorders, but these symptoms are by no means met with exclusively in those complaints. Inflammation of the eyes and nose occurs in other circumstances. When a child is in a weak condition the slightest irritation will lead to a sore. There is nothing in the sores in this case to suggest syphilis. One of the sores was granulated. There was nothing in the rash to suggest syphilis. The secondary skin eruption in syphilitic children rarely if ever assume the form which is shown here. When sloughs occur they do so late, and not so early as six weeks. They are of very rare occurrence, and I have only seen two cases of undoubted transmission, and both were by kissing. There was one singie sore, or seven or eight weeks afterwards rash breaks out all over. There is nothing to suggest a syphilitic character in a sore itself. In the vast majority of cases if a child died from syphilis there would be obvious indications of it.

By a juror: I saw nothing to suggest to my mind that the deceased was suffering from syphilis.

Verdict.

That the said J. V. on the twenty-fourth day of December, 1889, at ———, died of exhaustion resulting from improper feeding.

CASE 9, REPORTED TO THE COMMISSION BY MR. W. L. BEURLE.

Case of A. J. C.: report to the Commission of Dr. Thomas Barlow.

History given by the mother to me on the 15th March 1890. The child was born on the 6th May 1889. It was a healthy baby and continued so till after the vaccination on the 29th October 1889. The child was vaccinated at the station in ———, in four places on the right shoulder with matter from a glass tube. On the eighth day it was found that only two places had risen. The child was taken to the station but nothing was removed from the places. On the 10th day the child was very ill with burning heat and redness over the body and within two or three days afterwards some red spots appeared on the body. The child was taken to Dr. E. and Dr. J. who said the complaint was not scarlatina but they would not give the rash a name. Subsequently these spots became something like vaccination places—that is to say they came into mattery heads. Fresh mattery heads came out on both arms, on the back of the neck, on the back of the head, on the body, legs and hips. These spots continued to appear till one month ago, and those now present on the lower limbs appeared one month ago. No fresh spots of this description have appeared during the last month. With respect to the vaccination places the mother states that the scabs came off within the month, that they formed matter for a few days and then scabbed again; that they discharged on and off and finally healed in about six weeks. For the last month the child has been subject to another kind of spot, different from the mattery places above described as resembling vaccination places. The new kind of spot comes up as a small red spot which itches very badly and makes the child very restless, especially in the night. These itching spots never form matter; they have appeared chiefly on the upper part of the body and neck. The child's restlessness at night has been very bad, disturbing both parents. Otherwise the health has been good. The child has been taken to the North-Eastern Children's Hospital since the 17th December 1889 as an out-patient and has greatly improved.

Condition of the child A. J. C. (then aged ten months) when examined by me on the 15th March 1890.

First, *skin*. There are two vaccination cicatrices on the right shoulder, which present a normal appearance. They are about ¼ inch in diameter and are fairly superficial. On both lower limbs there are many patches of impetigo. These are nearly circular areas varying from a quarter to three-quarters of an inch in diameter, partly covered with a thin scab and in a few cases presenting flattish mattery heads. There are some brownish stains where some of the patches have healed but there is no sign of ulceration anywhere. The glands in the groin are slightly enlarged. On the trunk there are a few hard reddish spots which apparently come and go. These are what would be described as lichen urticatus and are the itchy spots to which the mother refers. There is on one shoulder a small patch of nettle-rash. On both arms and fore-arms there are a few stained areas apparently the vestiges of mattery spots similar to those on the lower limbs, but there is no evidence of ulceration.

Second, *general condition of the child*. Remarkably good. The child although only ten months old can stand and walk a little holding by the chair. He has cut three teeth. He shows no sign of disease other than the skin condition above described. He takes the breast well and at present is remarkably lively. There are no signs whatever of syphilis or scrofula. The mother and some of her other children whom I saw appear to be in good health.

Vaccina and co vaccina

Dr. A., the Public Vaccinator of———, has supplied me from his official book with the name of the vaccinfer of A. J. C. and a list of the children who were vaccinated from the same source and on the same day as A. J. C. I have examined these children at their homes, with two exceptions, the reason for which is stated subsequently. The following is the result of the examinations made on the 29th March 1890:—

(1.) Va cinifer A. J. C.

A. G., of ———, now aged 12 months. The mother states that four punctures were made, that the places did well and that the child had no rash. She is now a healthy child. She has four perfectly normal vaccination cicatrices. There is no rash on the body and there are no gland enlargements.

(2.) Co cinesa of A. J. C.

F. M., of ———. The mother says the vaccination gave no trouble. There was no rash. She is now a healthy child; has four normal vaccination cicatrices. There is no rash on the body and there are no gland swellings.

G. F., of———. The child was nearly four months old when vaccinated on the 29th October 1889. The mother states that the vaccination gave no trouble. The child got a few pimples on the vaccinated arm but they did not form matter and they had entirely disappeared within the week. She had quite recovered, but on the 3rd February 1890, three months after the vaccination, she died rather suddenly from what was certified as congestion of the lungs. The mother states that she herself was suffering at that time from epidemic influenza and it seems possible that the infant may have contracted the same disease.

M. M., of ———. There was no trouble with the vaccination during the first week. On the eighth day lymph was taken from the places and on the eleventh day a little redness appeared around the places and spread down to the hand. The child was taken to Dr. H. three days afterwards and he said there was a touch of erysipelas. In less than a week from this time the child was all right again. There was no scaling of the skin, no abscess and no spread to any other part of the body and the child did not appear ill. The vaccination places healed well and no rash appeared on the body subsequently. When I examined the child on the 29th March I found four normal vaccination cicatrices, no eruption of any kind on the body and no gland enlargement. The child is healthy and vigorous.

B. G., of ———. This child was vaccinated in four places but only two of them were successful. There was no trouble with the vaccination and no rash appeared subsequently. The child is healthy and vigorous. There are two normal vaccination cicatrices; there is no skin eruption and no gland enlargement.

F. C., of ———. This child cannot be traced as the parents have left the above address and it is not known where they have gone.

Comments on the cas of A. J. C.

This child is at present the subject of two skin affections, viz., (1) impetigo and (2) lichen urticatus. The first, which may be called the *mattery head eruption* appears to have had a definite commencement about the fourteenth day, to have resembled "vaccination places" according to the mother's statement, to have affected the greater part of the body and gradually to have cleared from all parts except the lower limbs. The legs and thighs still show examples of it, though for the most part in a condition of subsidence, and no fresh patches have appeared, according to the mother's statement, during the last month. As these patches have subsided, it is clear that there has been no true ulceration of the skin—that is, no loss of substance—but there has remained for a time some staining of the superficial layers of the skin in the sites of the formerly inflamed patches. The second skin affection, which may be called the itching rash, has, according to the mother's statement to me been only present for one month but from the

statement given from the North-Eastern Children's Hospital, and appended to this report, it appears to have existed for a longer period. Both these rashes, impetigo and lichen urticatus, are fairly common in children. They occur in infants who have never been vaccinated and also in older children at such long intervals from the period of vaccination, with intervening immunity, that they cannot be regarded as in any sense specifically limited to vaccination. Nevertheless from the history given it would seem that the first rash (the impetigo) started in a way suggestive either of a generalised vaccinia or of a contagious eruption derived from abrasion of the vaccination sites. I think the second is the more probable; for, although there was no lymph taken from the vaccination sites, yet they are said not to have finally healed till the sixth week, and abrasion may easily have occurred on or about the tenth day. The examination of the vaccinifer and co-vaccinees shows that there was no evidence of anything wrong with the lymph used. The course of vaccination seems to have been normal. One child (M. M.) had some redness spreading down to the hand after the removal of lymph on the eighth day, but it gave rise to no further trouble.

THOMAS BARLOW, M.D.

Copy of letter from Dr. E. B. Randall, of the North-Eastern Hospital for Children.

The North-Eastern Hospital for Children,
327, Hackney Road, London, E.,
March 7th, 1890.

SIR,

In reply to your communication of February 27th concerning A. J. C., I send the accompanying statement of facts obtained from the child's out-patient letter.

Although there is no note as to the general health of the child during the early part of his attendance here, I have every reason to believe that the general health has been at least fairly good, or a note would certainly have been made to the contrary.

The present address of Mrs. C. is ————. Any further information in my power I shall be pleased to give, but beyond the actual prescriptions I have no more facts to offer.

Yours truly,
ERNEST B. RANDALL.

To the Secretary of the
Royal Commission on Vaccination.

(*Enclosure.*)

Re A. J. C.

A. J. C., æt. 7 months, was first brought as an out-patient to the North-Eastern Hospital for Children on December 17th, 1889 by his mother, who stated that the child was vaccinated in November and had had rash all over ever since.

The child was under the charge of Dr. Pasteur but on December 17th was seen by the Senior House Surgeon, Mr. E. H. Brock (M.B. Lond.) who diagnosed "urticaria" and prescribed for that complaint.

Next seen December 31st, when "impetigo" was added to the diagnosis.

Next seen January 10th 1890, and, after this date, patient has attended regularly up to the present time and been treated for the above complaints, together with slight intestinal and bronchial catarrh.

On January 28th a note was made by Dr. Pasteur to the effect that the child was suffering from lichen urticatus complicated with impetigo contagiosum.

Since this date the child has steadily improved; and on March 3rd the impetigo had almost disappeared, but the mother stated that the child still suffered from outbreaks of an itching eruption occurring mostly at night—which was in all probability urticarial in nature. Child now plump and healthy-looking.

Neither the aspect nor symptoms of this patient have at any time suggested syphilis or any other specific disease, the symptoms being in all respects similar to those of numerous other cases of urticaria, with or without impetigo contagiosum which attend the Out-Patient Department of this Hospital.

E. B. RANDALL, M.B.,
Senior House Surgeon,
North-Eastern Hospital for Children, E.
March 7th, 1890.

CASE 10 [SERIES], REPORTED TO THE COMMISSION BY MR. W. L. BEURLE.

Case of E. M. D. and A. N.: report to the Commission of Dr. Thomas Barlow.

At the request of the Royal Commission on Vaccination I made an examination of the body of the child E. M. D. at the residence of the parents at —— on the 12th February 1889. I was not permitted by the parents to open the body, but I made as complete an examination as possible of the external appearances.

Dr. W., who had attended the child during her illness, and Dr. Jecks, Resident Medical Officer of University College Hospital, were also present at the examination.

Rigor mortis had passed off, the child having died on the 10th, two days before the examination. Slight greenish staining of the skin over the abdomen was present, due to decomposition, but otherwise the body was well preserved and showed only moderate emaciation.

There were no signs of violence or neglect, and there were no signs of congenital syphilis, but there were some indications of early rickets, viz., slight beading of the ribs.

The left shoulder presented the smooth cicatrices of four vaccination wounds.

These cicatrices were round in shape, of not more than ¼ inch in diameter, only pitted to a very slight amount, and were free from any indication of past excessive inflammatory action. With some difficulty the glands in the axilla could just be felt. With the exception of the vaccination cicatrices there was no difference in appearance or size of the two shoulders. The lower two thirds of each arm and the upper two thirds of each forearm presented some brawny induration of the skin and subcutaneous tissue, with slight desquamation of the skin. Over the point of each elbow there was a breach of continuity. The one over the left elbow was not bigger than a split pea, and corresponded, Dr. W. informed me, with the small incision which he made during life in order to evacuate some pus. The pus had been entirely evacuated, and on probing the wound it was found to be superficial, and no exposed bone could be detected. The breach of continuity over the right elbow was not larger than a 4*d.* piece, and corresponded, Dr. W. informed me, with the spot where a small abscess opened spontaneously during life. The pus had been entirely evacuated, and on probing the opening the abscess cavity was found to be superficial and no exposed bone could be detected.

Over the back and buttocks there was found extensive desquamation of the upper layers of skin. There was much patchy bright redness of the skin, and slight induration. The left lower limb showed brawny induration of both thigh and leg. In the thigh the induration occupied the upper two thirds. There was much patchy redness over the front as well as the back of the thigh. The front of the left leg presented redness, with some induration, and also some ill-defined fluctuation, as though some pus were present below the surface. On the dorsum of the left foot there was a small area where the uppermost layer of the skin had apparently been stripped (Dr. W. informed me that there was a bleb in this situation during life). The dorsum of the foot was puffy and yielded in the front part, a sense of fluctuation probably due to the presence of pus beneath the surface.

The right thigh presented brawny induration with redness along its upper two thirds. At the junction of the middle and lower thirds on the outer side there was a superficial fluctuating area probably indicating the presence of pus just beneath the surface. The right leg showed also brawny induration with redness, and in the upper third there was a slight boggy feeling imparted to the finger on pressure, probably indicating the presence of pus beneath the surface.

The dorsum of the right foot was puffy and presented an area two inches long by three-quarters of an inch broad, covered with a thin greyish superficial slough.

I now submit a statement kindly forwarded to me by Dr. W. who attended this child during life from the 24th January to the 10th February.

"In *Re* the Child D.

"I first saw the child D. on January 24th, when "there was a smooth rash over the greater part of the "back, which disappeared on pressure, and to which "I gave the name of erythema (simple.

"I was told by the mother that the child had been
" vaccinated on January 27th, and that the arm had
" been a bad one.
" On examination the part vaccinated appeared quite
" healthy, the four scabs being almost ready to fall.
" The mother also informed me that the day before
" she had taken the case to the Children's Hospital
" (Goldsmith's Row) and that the doctor there treated
" the case lightly, and told her to return in a few days.
" The next day the child was no better, and fresh
" erythematous patches occurred during a few following
" days, differing slightly from the first smooth rash.
" These patches were somewhat raised, angry-looking,
" and slightly hot to the touch.
" The left forearm (the one vaccinated) was second in
" order of attack.
" The disease gradually extended to the lower extre-
" mities.
" In the meantime the abdomen, thorax, and nates
" had been covered with a smooth red eruption similar
" to that on the back. The rash on the limbs was dis-
" tinctly patchy.
" Desquamation occurred as the redness subsided in
" the part.
" Towards the end of the illness the limbs attacked
" became indurated, a certain amount of cellulitis being
" present.
" This condition was most marked in the two legs,
" which were swollen and tense.
" The day before death, a black surface 1½ inch by
" 1 inch was noticed on the dorsum of the right foot.
" A bulla formed here and burst leaving a superficial
" necrosis.
" There was also a smaller black surface on the
" dorsum of the left foot.
" The child died on the 10th February.
" From almost the first the mouth and tongue were
" covered with ophthae, and about four days before
" death a fluctuating swelling was noticed over the
" right aberanon, which broke and discharged pus.
" About the same time another somewhat larger
" swelling appeared over the left aberanon.
" This I punctured and evacuated about half an ounce
" of apparently healthy pus.
" A third fluctuating spot was observed on the outer
" side of the left leg, and after death a fourth abscess
" was found on the outer side of the right thigh.

" T. C. W."

The child E. M. D. had been vaccinated on the 17th January 1890, by Dr. A. of ——— at the public vaccination station.

By the courtesy of Dr. A., I obtained the names and address of—(*a.*) All the children who had been vaccinated on the same day and from the same child as E. M. D.

(*b.*) Of the child from whom E. M. D. and the above group had been vacciuated.

(*c.*) Of the child who had been vaccinated from E. M. D.

Co-vaccinees. Of the first group there were 11 children, but one of these, viz., the child W. entered in the register as residing at ——— could not be traced, as the parents had left the place and the neighbours were ignorant as to where they had gone.

There remained 10 for investigation, and all these I visited at their own homes, and now record the condition of the children as found by me on the 15th February 1890.

(*a.*) A. N.; child cheerful though rather puny. There is no deep inflammation, or indeed any redness around the four vaccination wounds. There is no gland enlargement in the armpit. The vaccination wounds show a slight impetiginous character, as though the scabs had been rubbed off and the places irritated a little. There are also two small impetiginous areas on the forearm probably from auto-inoculation, and there is a little eczema behind the left ear.

The child is very poorly clad and dirty; it is at the time of my visit in the temporary charge of a neighbour. The father informs me the mother is out working most of the day, he is out of work, there are several children. It is evident they are very poor and that the infant cannot have adequate attention.

K.; vaccination cicatrices perfectly normal. No gland swelling in armpit. Child quite healthy, well cared for, and thoroughly clean. No skin eruption.

C.; vaccination cicatrices quite normal. No gland swelling. Healthy child. No skin eruption.

E.; vaccination cicatrices quite normal. No gland swellings. Has slight stomatitis, but otherwise child healthy and cheerful. No skin eruption.

H.; three of the vaccination wounds still present a small scab, but they are perfectly quiet, and there is no redness around them. The other scab has dropped off and left a normal cicatrix. There are no gland swellings in the armpit. The child is perfectly healthy and cheerful. No skin eruption.

A.; vaccination cicatrices normal. No gland swelling. There is a small boil in the left thigh which the mother says began to appear seven days ago. It appears to give the child no trouble. The mother also states that eight days after the vaccination the child had signs of a cold, and a slight discharge from one ear. This is quite healed now, and the child looks well.

C——y; vaccination wounds nearly healed. The child is rather pale, and slightly rickety. The mother says she has had her children fast, and this is the seventh child.

R.; vaccination cicatrices normal. No gland swelling in armpit. Child healthy. No skin eruption.

R——r; vaccination cicatrices normal. No gland swelling. Child healthy. No skin eruption.

F.; vaccination cicatrices normal. No gland swelling. Child healthy.

Vaccinee. (*b.*) B—— s. [From this child's arm E. M. D. and the foregoing were vaccinated.]

Of the four vaccination wounds one is cicatrized and normal, the other three are slightly impetiginous, but there is no intervening inflammation or redness, and there is no gland swelling in the armpit. There are three small impetigo scabs on the scalp, but the child is otherwise healthy and cheerful.

The mother states that a few days after this child was vaccinated her other children developed a rash which one took from the other, and that after the eighth day (when matter was taken from this child's arm), she took the rash from the other children, which led to the scabs on the head, &c. From the mother's description it is probable the rash was simply impetigo, which is often contagious.

(*c.*) B——y. [Vaccinated from E. M. D.]

Sub-vaccinee of E. M. D. Vaccination cicatrices normal. No gland swellings. Healthy child. No skin eruption.

Summary of conclusions. The disease to which the child E. M. D. succumbed was characterised by the appearance of extensive areas of redness, with induration of the skin in different parts of the body. The redness, &c. partly subsided, but in some regions reappeared again. It was followed in some parts by peeling of the upper layers of the skin, and in others by abscesses under the skin. In the course of the illness two blisters appeared, one on each foot. One of these blisters subsequently was followed by superficial sloughing.

The above is the characteristic course of an attack of phlegmonous erysipelas in an infant.

The important question is what was the relation of this illness to the vaccination.

First. From my investigation of the cases of the other infants vaccinated on the same day and from the same source, it is evident that there was no other example in the group of a similar attack to the one to which E. M. D. succumbed.

Of the 10 children in group *a*, with the exception of A. N., the vaccination cicatrices were satisfactory, there was no evidence of gland swelling or skin eruption, and the children were in fair health. In A. N.'s case (the first of group *a*), there was a slight impetiginous character about the vaccination areas and two small impetiginous spots on the forearm, and a very slight eczema behind one ear, but these lesions were exceedingly mild in character. There was no evidence of blood poisoning and the child, though rather puny, was cheerful and showed no sign of constitutional depression.

In not one of group *a* was there any evidence, or anything in the history given, pointing to erysipelas or deep inflammation in the neighbourhood of the vaccination punctures.

Second. The child vaccinated from E. M. D. was healthy, and the course of the vaccination had been quite normal.

Third. The child from whom E. M. D. and the other members of group *a* had been vaccinated was in good health and cheerful, although there was a very slight impetiginous character about two of the vaccination areas, and there were three small spots on the scalp. There had been no indication whatever of erysipelas in her case. The mother's history pointed to the possibility of the child having contracted the impetigo from her brothers and sisters. Whether this be so or not, the general condition of the child was quite satisfactory and the local condition unimportant.

Fourth. In the case of the child E. M. D. herself, there seems every reason to believe that the progress of the vaccination wounds was perfectly normal.

At the post-mortem inspection there was no sign of deep inflammatory action, the cicatrices were quite normal, and the testimony of Dr. W. as to the condition during life agreed with this.

It is clear that the erysipelas was not due to any carelessness in the vaccination. The interval which had elapsed (viz., 14 days), the fact that at the onset of the erysipelas the vaccination wounds were perfectly quiet and scabbed over, and finally that the redness, &c. commenced elsewhere than at the vaccination site, are all strong arguments against there having been a primary inoculation of erysipelas.

THOMAS BARLOW, M.D.

CASE 11, REPORTED TO THE COMMISSION BY MR. J. H. LYNN.

Case of E. M. R.: report to the Commission of Dr. Theodore Dyke Acland.

E. M. R. was vaccinated when nearly four months old. Since birth, according to both the doctor and the parents, she had been perfectly healthy, with the exception of some slight eczema on nates which had completely healed six weeks before vaccination.

On Thursday, the 27th November 1889, the child was inoculated with lymph obtained from vesicles on the arm of a child, C., of ———, who had been vaccinated with lymph obtained from the National Vaccine Establishment. The result of this latter vaccination has been entirely satisfactory, and the child has since continued in good health.

The lymph from the child C.'s arm was preserved on old ivory points, which had been previously used and cleansed only with hot water, no disinfectant of any kind having been applied. After being charged they were carried, loosely packed, wrapped in paper, in a waistcoat pocket, not in any way protected from external contamination. This method of using old ivory points, without disinfection and with no particular precaution against contamination, is the one commonly made use of by the vaccinator.

For one week after vaccination the arm presented a typically healthy aspect, the vesicles not being covered or in any way protected from the external air. At the end of the second week some cellular inflammation was noticed on the upper part of the arm, which spread considerably upwards and downwards. Suppuration occurred around the vaccination vesicles, and at the end of six weeks the affected area was still covered with ashy sloughs. The constitutional disturbance seems to have been slight, there was some sweating, chiefly of the head, but no rigors or convulsions, the temperature was not taken. The lymphatics of the arm were affected, the axillary glands were swollen, and painful, but no abscess was formed. There was not at the time, nor has there been since, any general cutaneous eruption. At the end of the third week after vaccination a small hard nodule was felt on the right cheek; this subsequently became enlarged, and broke down, discharging a considerable amount of pus. The scar is visible in the photograph. About three weeks after this a similar swelling was noticed on the right forearm. From that time to this the symptoms have made irregular progress, varying only in intensity but not in kind. The child's health has been fairly good, there has been no diarrhœa, no vomiting, food has been fairly well taken, and general nutrition is well maintained. The child is well made, plump, firm fleshed, bright eyed, and intelligent. Physical examination does not give any evidence of disease of the viscera. There is no sign of rickets, scrofula, or any inherited taint. On the left arm, just below the insertion of the deltoid, there are two puckered cicatrices at the points of original inoculation. There has been considerable loss of substance owing to the sloughing that subsequently took place, but the wounds are healed. The child's temperature is normal. Both hands are greatly disfigured and distorted by masses of inflammatory tissue, as seen in the photograph.

Right hand. The right forefinger is enormously swollen chiefly over the proximal phalanx, the skin is thinned, tense, deep red, with small superficial vessels running over it, and adherent to the parts below; there is pus pointing on the inner side. There is a hard mass over the metatarsal bones of the little and ring fingers. There is no evidence of the presence of pus below or within this, and the integuments are not involved or adherent. Round and below the right elbow there is much cellular inflammation. The part is hot, swollen, and tender. The elbow joint, apparently, is not involved, and is freely movable without pain. Although the parts in close contiguity to several joints are greatly inflamed, and there has been a free formation of pus, it does not seem that in any instance the joint itself was affected, and the swelling would appear to have originated in the soft tissues. There is probably affection of the shafts of the bones, but whether this is primary or secondary to the inflammation there is no evidence to show. No examination for dead bone has up to the present been made.

Left hand. The fore and little fingers are enormously swollen, especially towards their proximal ends. The character of the swelling is the same as that described above. The joints are freely movable and apparently not painful. The terminal phalanx of the thumb is swollen and red, but there is no discharge of pus. On the dorsum of the hand there are two separate swellings, both fluctuating.

Thigh. There is one small swelling deeply seated at the back of the right thigh.

Face. There is a scar on the right cheek with some inflammatory thickening round it. This was the seat of the abscess first noticed. Over the left orbit there is a large fluctuating mass with a little surrounding oedema occupying almost the whole length of the supra-orbital ridge, and extending rather more than 1 inch above it. There is one small hard mass about the size of a bean immediately over the root of the nose, without any evidence of formation of pus.

Family history. The father's personal history is excellent. He entirely denies ever having had, or the possibility of his ever having had any syphilitic infection. No near relation on either side has died of consumption, and his parents have lived to 69 and 70 respectively. He is 38, his present wife (his second) is 33. One of her brothers and her maternal grandmother died of phthisis. Both father and mother seemed to bear excellent characters and are comfortably off, and the child is excellently well cared for.

Credibility of history. The information given was supplied by Mr. R., the father of E. M. R., and by Mr. L., the doctor who performed the vaccination. They gave me the details independently, and I questioned them both in the presence of the other whether the details stated were correct. There was not the slightest apparent effort to do otherwise than to lay the fullest possible information before me, nor any desire to make the case out either better or worse than it is.

Nature of lesion. The question seems in the main to be, are the lesions as implied in a memorandum from Mr. R. (the father) of the 10th April 1890, syphilitic or due to some other cause, are they, in fact, softening gummata-strumous abscesses, or due to some septic infection? Of the former there is no evidence. The history of their onset and the subsequent development are not in accordance with what is known to be the course of inoculated or congenital syphilis, and in addition, there is no evidence of syphilitic taint, either in the father or in the child from whom the vaccine lymph was taken.

? Syphilitic.

a. Inoculated.

b. Congenital.

? Strumous. There is not any evidence of the child having or having had strumous disease of glands, and the family history does not point to any decided tendency to tubercular disease, and although the occurrence of multiple abscesses might lead to the suspicion of their being of strumous origin, the whole history of the case points to their being intimately connected with the cellulitis which followed vaccination.

? Septic. It is not possible to be certain that the septic virus was introduced at the same time as the vaccine lymph, for an interval of a week elapsed between vaccination and the first suspicion that anything was wrong, at the same time the history of the case points to the conclusion that septic poisoning followed vaccination; but whether the poison was introduced with the vaccine virus or found entrance through the ulcerated surface at the point of inoculation at a later date I have no evidence to decide.

THEODORE DYKE ACLAND, M.D.

CASE 12, REPORTED TO THE COMMISSION BY MR. J. H. LYNN.

Case of M. P.: report to the Commission of Dr. Thomas Barlow.

This child was brought to me for inspection on the 25th February 1890.

The following account was given to me by her mother:—

The child was vaccinated when eight to ten weeks old by Dr. W., of ————. Two punctures were made. Six or seven days afterwards the scabs were black. The scabs came off in three weeks' time, and left the vaccination spots as they are now. They did not form matter or ulcerate again.

Five days after the vaccination a white scurf appeared on the top of head, which after a few days began to run with thin watery stuff, and some days afterwards became mattery. About the same time a scurfy place appeared in the left armpit. This afterwards gave rise to a sticky, watery discharge, then became a deep sore, and a hard lump came in the armpit. About a week after vaccination sore places came out on the buttocks and about the privates, and also about the forehead and eyes, and the sores about the eyes were so bad that they could not be opened for 17 or 18 days.

As the scabs were removed from the different sore places, watery, sticky stuff escaped and fresh scabs formed afterwards. The watery, sticky discharge was of such a character that if a silk handkerchief was in contact with it it got stiff from the discharge. The child had sore places about her body more or less for five months. She never had any sores on the palms or soles, but she had some on the backs of the fingers and on the tops of the toes, and some of the nails came off.

The mother says she moaned a great deal, slept badly, and suffered much irritation when she got warm. The child was fed on cow's milk and limewater.

The mother informs me that she herself is 23 years old, that she has had good health. She says the father is 29 years, is strong, free from rheumatic pains, sore throat, or rash. She has been pregnant four times. The first time she went the full term, but she had a hard labour, and the infant died in the birth.

The second time she had a full-term child, now living, aged four years. This child had no rash or snuffles, and is now healthy. The third time she had twins; one died, the other is alive and healthy. M. P. is the fourth.

State of the child, M. P., February 25th, 1890. A fairly nourished child, aged one year eight months; walks well; has a good voice; is very cheerful. There is no appearance of cachexia. Teeth good. She has a slight nasal catarrh. Her nose is well formed; there are no cracks about the corners of the mouth. The throat is natural. Hair good; eyebrows ditto. The bones are well formed. Only slight evidence of rickets about ribs and leg bones. Heart and lungs natural; no evidence of abdominal disease. The child has two vaccination scars on the left shoulder. They are oval in shape, one measures ¾ inch by ¼ inch; the other ½ inch by ¼ inch. The child has a little scabbed eczema behind the right ear, and a small moist area in one groin.

On the buttocks there are a few brownish scaly areas about the size of the end of a split pea. There is one small scar on the back of the left calf, and there are two on the back of the right thigh. There is a small scar with loss of substance below the situation of the third right finger nail.

Copy of letter from Dr. W.

MY DEAR SIR, March 9th, 1890.

IN REPLY to your letter respecting the little girl M. P., I vaccinated her on August 21st, 1888, at the age of six weeks. Two months afterwards her mother brought her to me suffering from eczema. I prescribed for her for some time and then told Mrs. P. I should do so no longer unless she paid me.

I heard no more of her after that until Dr. W., the Medical Officer of Health for ————, called on me to inform me he had been desired by the Board of Guardians to examine the child and send them a report, as Mrs. P. had complained that her little girl was suffering from a disease contracted through vaccination. (This I may say was the first time I had heard she considered the skin affection had anything to do with the vaccination.) After examining the child Dr. W. wrote to the Board saying the child was suffering from eczema not attributable to vaccination. This is all I heard of the case until your letter reached me this morning. I am sorry I fail to remember the infant from which I took the lymph, but on the same day, and with the same lymph that I vaccinated little P., I also vaccinated another child and know it proved satisfactory.

Yours truly,
S. W.

On the 26th March 1890, at the request of the Royal Commission I went to —— —— to further investigate the case of M. P.

I saw Dr. W., but could not obtain any additional information as to the source of the lymph. He told me that in the two children in question the insertions were made from ivory points.

He gave me the address of the other child vaccinated from the same source and on the same day as M. P., viz.:—M. E. G., —— ——, and I visited this child.

Account from the mother:—The child was vaccinated on the 21st August 1888, when four months old. She affirms that the child was vaccinated from the tube. Two punctures were made on the right shoulder. They rose well. The child was taken to the doctor on the eighth day; nothing was taken from the places. The scabs came off very soon and there was no rash or any disturbance of health afterwards. She thinks the vaccination took in this child better than in any of her children.

State of child M. E. G. March 26, 1890. Healthy child. Has two vaccination scars on right shoulder, oval in shape, ¼ inch short diameter, rather more in long diameter, foveated. No glands on armpit. Teeth good. Walks well. Chest and abdomen natural. Has at the present time a little eczema on cheeks and slight running from the nose. The mother says this is only of one week's duration; she attributes it to the child's having been out in a keen wind.

I subsequently visited the child M. P. at its home.

I found the eczematous spots from which the child had suffered all healed with the exception of a very small area below the right ear. She looked fairly well; the complexion was good, the tongue nearly clean. There were no enlarged glands to be felt; no sign of chest or abdominal trouble.

The mother states that on Friday last the child had a fit, became stiff, and lay asleep. *But on inquiry she says there was no twitching anywhere.* It is observed that the child shows no signs of weakness of limb or paralysis.

Conclusions. From papers submitted to me by Mr. Lynn I learnt that this case was brought under the notice of the Royal Commission through Mr. C. F., surgeon, of ————. Mr. F. states that he has no doubt it is what he calls "immoral disease"; further, "not the "least part of the suffering was the cruel slander of "the low neighbours long borne by the parents owing "to the child's notorious state."

It appears, therefore, desirable that I should first consider the question as to any evidence in this case of syphilitic infection.

1. Taking the mother's account of the vaccination and its sequelæ it is to be observed that the history given is not like that which occurs in undoubted examples of inoculation of syphilis. The scabs came off at the end of three weeks from the date of vaccination, and there *was no fresh ulceration at the sides of the punctures as there ought to have been within six weeks if syphilis had been inoculated.*

2. The progress of the skin affections, viz., scurfy patches followed by moist, sticky discharge, then by "mattery" places, itching considerably when the child was hot, was not like the progress of syphilitic eruptions.

3. Examination of the present condition of the child does not reveal any definite syphilitic lesion.

4. The history of the child M. E. G., who, according to Dr. W., was vaccinated on the same day and from the same lymph as M. P. is not that of inoculated syphilis, and the examination of the child M. E. G. shows no evidence of syphilis.

For the above reasons I am of opinion that the assumption that the child M.P. was the subject of inoculated syphilis may be entirely set aside as untenable.

What was the nature of the illness from which the child suffered?

Now it is to be observed that the course of the vaccination wounds was satisfactory. The mother states that the vaccination scabs became black, but that may

have been from a little blood having been extravasated. There is no reason whatever to think that there was any sloughing or gangrenous process; for in three weeks the scabs dropped off, leaving a healed surface, "like it is now" is the mother's expression. The vaccination scars are quite moderate in size, and the mother is quite definite that there was no ulceration in their situation.

The first skin symptom was a scurfy patch on the top of the scalp, soon followed by a sticky, watery discharge, and then by a mattery discharge. The condition was one of eczema going on to impetigo. The subsequent impetigo appears to have been very severe, and there was much trouble about the eyelids and elsewhere. But there was no permanent damage to the eyes, and on the limbs there were a few small cicatrices, which were of little importance. The child seems to have had some relapses of eczema, but I was unable to find any evidence of permanent damage to the child's health.

The case cannot be regarded as one of true septicæmia from vaccination, though it is quite possible that the child, being predisposed to eczema, the vaccination may have been the determining cause of the outbreak. It should be remembered, however, that similar cases of protracted severe and relapsing eczema may occur in children who have never been vaccinated at all. Further, it is impossible, after such a long interval, to negative the existence of *other factors* besides vaccination, which might have caused simple eczema (such as this child had at first) to take on the serious character which it subsequently assumed.

I again draw attention to the fact that no lymph was taken from the vaccination sites, that the scabs were allowed to drop off naturally, and that there was no suppuration or discharge at the sites which might have given rise to auto-inoculation.

I think it important to note that the statement in the "form" herewith appended to the effect that the parents were healthy was not quite accurate. I learnt at ——— that for a considerable time Mrs. P. had been suffering from uterine or vaginal trouble, for which she had at times been attending a hospital at ———.

THOMAS BARLOW, M.D.

(Paper handed Dr. Barlow by Mr. Lynn and referred to above.)

FORM FOR TAKING PARTICULARS OF CASES OF INJURY OR DEATH FOLLOWING VACCINATION.

Name and address of father	W. P., ——— ———.
Name of child.....	M. I. P.
Age when vaccinated	About 10 weeks old.
Date of vaccination	About 22nd of 9th month 1889.
By whom vaccinated	Private doctor.
State of health before vaccination.....	Good health before vaccination.
Are other children healthy or are any dead?	Other children most healthy.
State of parents' health { *Father* / *Mother* }	Father and mother both healthy.
Was the lymph used taken from another child or was calf lymph used?	Taken from another child.

RESULTS.—[*Give here full particulars, with dates, of any injurious results following the operation, and in cases of death, state the cause of death as certified by the medical attendant, as well as the parents' view of the case.*]

From father and mother of child:—Five days after vaccination baby came out in one mass of running humour. Seven weeks after, the dear child blind for 18 days. Could not see a particle of flesh for scabs for five months. How cruel it is that we should have to look on our dear baby through been compelled by law to have such cruelty and disfigure her for life. It's a daily trouble to us to see our little child a year and a half old having to suffer so much through the vaccination, and was compelled to have it done. My wages is 1*l.* 1*s.* per week. I have to pay 3*l.* 8*s.* 6*d.* or have my home taken to pay the doctor, which he has threatened a few days ago. If it had ended in the blood after all the dear child suffering we would have a little better prospect but for her to be breaking out every now and then under the arm and the legs.

Signature of parent..... W. P.'s wife, for both,
E. P.

Witness ..... C. F., Surgeon ———.

Date .....15th of 2nd month (February) 1890.

Case 13, reported to the Commission by Mr. J. H. Lynn.

Case of E. V. H.: report to the Commission of Dr. Thomas Barlow.

On the 25th February 1890, at the request of the Royal Commission on Vaccination, I examined the child E. V. H., alleged to be suffering from syphilis, the result of vaccination, and I herewith beg to submit my report on the case.

1. History obtained from the mother of the child.

The child is now two years eight months old. She was born at full time, and suckled for eleven months.

So far as the mother knows she was a healthy baby.

At five weeks old she was vaccinated by Dr. C., of ———, directly from the arm of another child. Only two punctures were made below the left shoulder.

At the end of a week the arm was red down to the elbow.

At the end of a fortnight the scabs dropped off, and the places looked healthy, and gave no trouble afterwards.

A fortnight after this, viz., one month after vaccination, a rash appeared on the left arm, which consisted of small red pimples which did not contain "matter" at any time. Subsequently other pimples appeared on other parts of the body of the same character, and the patches now seen on the body are the remnants of these pimples. Some of the spots have died away, and a few fresh ones have appeared from time to time.

At times the child has suffered from itching when the spots have first appeared, especially during the night when warm in bed.

The child's general health has been good, with the exception of two attacks of bronchitis.

She is the only child, and her parents are both healthy and free from skin eruption.

Condition of child, February 25th, 1890.

A healthy, cheerful child, well grown for her age.

Has cut all her teeth proper to her age, except the last upper molar on the left side.

The face, for the most part, of good healthy colour. Nose, mouth, tongue, and throat healthy. Voice good.

Chest and abdominal viscera natural, except that the liver is felt a little lower than normal.

Bones and joints are natural.

Skin condition.

Along the temples, and passing into the front of the scalp, also on both sides of the neck, on the trunk, shoulders, thighs, and legs, and on the top of each foot, there are situated numerous patches of altered skin, varying in size from a split pea to a threepenny piece.

These patches are smooth, very slightly raised, and brownish-red or pale chocolate in colour.

At present there is no sign of irritation about any of them, but on one arm there is the remains of a scratch, and the mother states that the child occasionally suffers much from itching.

The palms and soles are free.

The nails are free.

There is no gland enlargement anywhere.

There are two well-marked vaccination scars situated on the left shoulder.

There are no cicatrices elsewhere.

Conclusions.

There is not the slightest evidence of syphilis in this child.

The skin affection of which she is the subject is a rare one, and has attracted much attention during the last 12 years both in England and abroad. It is a well-marked example of *urticaria pigmentosa*. This form of skin eruption begins in infancy, in some cases shortly after birth, with red spots or wheals, which are commonly attended with severe itching. Primarily, the affection seems to be allied to nettle rash. The itching generally subsides in the course of time, but the spots become pigmented and remain more or less persistent for several years. The disease is not amenable to treatment, but is not attended with any damage to the general health of the subject affected.

Having ascertained that the child had been taken to the Dermatological Society of London for inspection by the members of that society, I obtained from Dr. T. Fox, the secretary, the opinion which had been formed upon it. It agrees with that above expressed. I append the letter.

Thos. Barlow, M.D.

(*Dr. Fox to Dr. Barlow.*)

14, Harley Street,
Cavendish Square, W.,
February 26, 1890.

Dear Barlow,

I showed the case you mentioned to me at the Dermatological Society at the request of Dr. M., of ———, on ———. The members present were Dr. McCall Anderson, of Glasgow; Dr. Brooke, of Manchester; Dr. Cavafy, Mr. Hutchinson, F.R.S., Dr. Lees, Dr. Payne, Dr. Perry, Dr. Pye-Smith, F.R.S., Mr. Sheild, Dr. Alder Smith, Dr. Stowers, Dr. Thin, Mr. Morrant Baker, Mr. Malcolm Morris, Mr. William Anderson, Dr. Pringle, and myself, and we were unanimously agreed that the case was one of Urticaria pigmentosa.

Yours very truly,
(Signed) T. Colcott Fox.

Case 14, reported to the Commission by Mr. J. H. Lynn.

Case of W. H.: report to the Commission of Dr. Thomas Barlow.

At the request of the Royal Commission, I examined the above child at ———, on the 8th March 1890.

The mother was away in service, and my efforts to get to see her subsequently have been futile, as she appears to be unwilling that her address should be known. The young woman in charge of the child could only give me second hand information as to the history of the case. I have supplemented this by inquiries at the ——— Workhouse, where the child was born and vaccinated, and at the Temperance Hospital, to which it was taken as an out-patient on two occasions.

History.—The child was born in the Workhouse on the 26th January 1890. He was vaccinated with calf-lymph on the 3rd February 1890. Dr. R., the medical officer, informs me that the course was satisfactory, but that there was an enlarged gland in the armpit; there was, however, no appearance of inflammation of the armpit, and the arm did well. The mother and child were discharged on the 19th February, and the mother made no complaint at the time of discharge.

Two other infants were vaccinated with calf-lymph from the same source, and Dr. R. reports that the course was satisfactory as far as he knows.

On the 25th February the child W. H. was taken to the Temperance Hospital, and seen by the house surgeon, who reports that there was an inflamed gland in the left armpit, with some redness in the armpit, extending over the shoulder. The arm was bandaged to the side, and a dose of calomel ordered. Two days later the child was taken again to the Temperance Hospital, and the condition reported was the same. I cannot ascertain that the child has been taken to hospital since that time.

Condition when examined March 8, 1890.

The child is living in a cellar. It is at present in charge of a young woman who appears to be well meaning, but has no experience in taking care of children. The child is rather puny; it is fed on Swiss milk and bread sop, and is said to have green offensive motions.

There are four vaccination scars on the left shoulder. They are quite healed and are about a quarter of an inch in diameter, slightly puckered in character.

There is a patch of eczema in the left armpit about the size of a crown piece which is moist with a little watery discharge.

This is quite obviously kept up by the fretting of a dirty flannel binder, the edge of which presses against the sore armpit. There is no redness now about the left shoulder. In the armpit a slightly enlarged gland can just be felt.

There is a very little patch of eczema behind the right ear, one in the right fold of the neck, and one in the right armpit. There is also a little on the hips corresponding with the situation where the napkins are applied.

It may be observed that although some lotion has been supplied for the child no attempt is made to keep anything in contact with the sore places, with the exception of the dirty flannel binder before mentioned, which is painful.

The vaccination does not appear to have been severe, for although the scars are a little puckered, they are of quite moderate extent in superficial area; the vaccination must, however, be held responsible for the enlarged gland in the armpit, which is now subsiding. It is possible that the moderate eczema from which the child is now suffering may have been initiated in consequence of the vaccination, but the injudicious feeding, the scanty supply of fresh air and light, and the defective nursing which the child has had have probably contributed to the condition of skin now present.

Appended are reports from Dr. R., —— Workhouse, and a copy of a memorandum by Dr. Paterson, house surgeon of the Temperance Hospital.

THOMAS BARLOW, M.D.

(From Dr. R.)

W. H., born January 26, 1890.

When vaccinated?	February 3rd, 1890.
Calf-lymph or humanised?	Calf.
Course, satisfactory or otherwise?	Satisfactory. No inflammation of arm.
When last seen?	February 19th, 1890.
When discharged?	February 19th, 1890.
Were any other infants vaccinated from same source?	Yes, two others.
Was progress satisfactory or otherwise?	Satisfactory, as far as I know.

W. R.

DEAR SIR, March 18, 1890.

I cannot personally remember the child ——, but find that he was vaccinated with two others at the workhouse on 3rd February, and that the lymph used was calf. I hear from the nurse that there was an enlarged gland, not inflamed at all, under the arm, that the arm did well, and the mother and child remained in the ward until February 19, when she was discharged. The mother made no complaint, for I asked when I signed her discharge, as I do in all cases, whether she had any complaint to make.

If I can assist you in any further information, I shall be most happy to do so.

Yours truly,
W. R.

Dr. Barlow.

(Copy of out-patient memorandum made by Dr. Paterson, house surgeon, Temperance Hospital.)

February 25, 1890.

W. H., æt. five weeks.

Inflamed axillary gland (post vaccinal) with cutaneous erythema over deltoid and scapula.

Treatment, bandaged and calomel.

CASE 15, REPORTED TO THE COMMISSION BY MR. J. H. LYNN.

Case of W. R. S.: report to the Commission of Dr. Thomas Barlow.

History of case given to me by the mother on the 12th March 1890:

The child was born on the 11th April 1889, and had no skin trouble until after vaccination.

He was vaccinated when five months old by Dr. P., of ——. The lymph was taken directly from a baby's arm. Two punctures only were made, on the right shoulder. On the eighth day some lymph was removed in order to vaccinate another baby, and likewise some was drawn into a tube.

The vaccination places on W. R. S.'s shoulder took well, but were not severe. At the end of four weeks the scabs dropped off and left the part quite healthy.

With respect to the rash from which the child suffers. Six days after the vaccination there appeared on both arms, at the same time, some small pimples, which afterwards ran together, and formed a red place.

Fourteen days after vaccination, some more small red pimples appeared on the cheeks, and gradually spread on to the forehead.

No eruption has at any time appeared on the trunk. The child has had a certain amount of irritation about the face, especially at night, rubbing his face into the pillow, but is a good baby during the day.

He has been well in every other way. The mother has brought him up entirely on the breast.

The child was taken to two doctors, and subsequently to the Skin Hospital, Blackfriars, but the mother does not appear to have made any attempt to keep any ointment or other application in contact with the affected parts of skin.

Condition when examined on March 12, 1890.

The child presents a well marked patch of red irritable eczema on the forehead and on both cheeks. He has also a patch on both forearms.

He has two small vaccination cicatrices on the left shoulder. They are quite natural.

He has no glands in the armpits, but has very slight enlargement of the glands at the back of the neck, probably the result of the eczema on the face.

Otherwise the child is exceedingly well developed and rather fat. He has cut five teeth, and is remarkably active and cheerful. His mother seems strong, but the father rather a thin delicate looking man.

Comments.

In this case, according to the mother's account, the course of the vaccination was singularly free from signs of irritation.

The rash appeared on the sixth day on both arms simultaneously, and it has run the course of an obstinate but simple eczema.

Cases identical with this in naked eye characters, in distribution and course, occur not unfrequently in children who, in every other respect, may be perfectly healthy, and who have never been vaccinated at all.

Such obstinate cases very often start within the first six months of life, and may go on more or less continuously for a couple of years and show proneness to relapse even after that period.

Our knowledge of the causation of such obstinate relapsing cases is very unsatisfactory, but the occurrence of cases identical with this in non-vaccinated infants cannot be too strongly emphasised.

THOMAS BARLOW, M.D.

CASE 16, REPORTED TO THE COMMISSION BY MR. J. H. LYNN.

Case of A. H. G.: report to the Commission of Dr. Thomas Barlow.

A. H. G., aged eight months, of ——.

History given to me by the mother. The child was vaccinated on the 12th November 1889, then aged three months. Three punctures were made; lymph was taken from a healthy baby's arm—places did not rise till nearly a week; they formed proper heads—nothing was taken from them. Scabs formed naturally and dropped off within a month—the heads were not rubbed off. She thinks about a fortnight after the vaccination there was a watery discharge from the cheeks and forehead; the watery discharge was very sticky, but quite clear. No mattery pimples existed at that time, but shortly afterwards some mattery heads appeared on the face, and these scabbed. Fresh sores appeared below the ears, and also inside the ears, and a mattery discharge escaped. The discharge from the ears ceased one month ago. The face has been mending for a fortnight. The right wrist, right elbow, left hand, and left elbow also became affected with watery places. A fortnight ago two pimples appeared on the front of the right leg; these have formed a little matter and have scabbed. The child has had very restless nights but during the last fortnight has been better in this respect.

The motions have been always offensive and rather light coloured. On the day of vaccination a red chapped appearance was present on the cheeks which the mother attributed to the cold wind. Her son D., aged nine, who often nurses the baby, has had some mattery spots on both hands, but they are now quite well. The child was suckled two months and has since then been fed on cow's milk, biscuits and bread sop. This child is the second by the present husband; the other child by this husband is now three years old and has a clear skin. The mother had six children by a former husband; one died of scarlet fever—the other five are delicate but have had no skin troubles.

Mr. C. F. G., who vaccinated the child A. H. G., states (see his letter appended to this report) that on the day when the child A. H. G. was brought to him for vaccination he observed some roughness of the skin of the face; he drew the mother's attention to it, and she said she thought it was due to exposure to the wind. Mr. C. F. G. believes this was the commencement of the eczema from which the child afterwards suffered. He reports that several other children were vaccinated from the same source and that he had not heard any complaints of their having suffered from eruption.

Condition of the child A. H. G. when examined by me on the 3rd May 1890. There are three vaccination scars on the left shoulder which are quite normal. One of them is an eighth of an inch in diameter and the other two are each less than a quarter of an inch in diameter. There are no enlarged glands in the armpit. There are patches of impetigo in the following situations: the back of the right elbow, the front of the right wrist, the back of the left hand near the thumb, the front of the right leg; and there are patches of moist eczema on the left fore arm, on the forehead, on both cheeks, and behind both ears. The glands on the left side of the cheek are a little enlarged, probably as the result of the skin irritation. The child is ricketty, having beaded ribs and groves on each side of the chest, but is otherwise not badly nourished.

Comments. It is clear from the history and from the appearance of the vaccination scars that the progress of vaccination was satisfactory. If the mother's statement is correct, there was no abrasion of the vaccination pocks, so that it is unlikely that the skin lesions were started by contagion from the pocks. It seems clear that on the day of vaccination the child already presented commencing eczema of the cheeks. Such a condition, going on to moist weeping surfaces, is frequently followed in infants by an eruption of mattery heads (impetigo) on other parts of the body, and such mattery heads are not infrequently contagious to other people, *e.g.*, to anybody who nurses or kisses such a child, as in the case of the brother of the child under consideration. There is no evidence that the child's nutrition has been damaged by the skin eruption; the moderate rickets, of which it is the subject, is probably due to its being the eighth child of the family and to its having been brought up by hand.

Appended are the report of Mr. C. F. G., who vaccinated the child, and letters from Mr. Lynn concerning the history of the case.

THOMAS BARLOW, M.D.

Copy of a letter from Mr. C. F. G.

SIR, March 18th, 1890.

IF I remember rightly when the child A. H. G. was brought to be vaccinated, I pointed out a certain roughness of the skin on the face; the mother however stated that she thought it was only due to exposure to the wind. It was not of such a decided nature as to warrant a refusal to vaccinate. I have no doubt now but that it was the commencement of the eczema from which the child afterwards suffered.

Several other children were vaccinated from the same source, and I have not heard the slightest complaint of their having suffered from any eruption.

I am, &c.

To Bret Ince, Esq. C. F. G.

Copy of letters from Mr. J. H. Lynn.

Elizabeth Villa, Clova Road,
Forest Gate, London, E.,
14th March 1890.

DEAR SIR,

A. H. G., child of Mrs. G. of ———, was vaccinated when three months old on the 12th November 1889 by Mr. C. F. G., M.R.C.S., with humanized lymph. The child was in good health. In a fortnight the arm became inflamed. A rash appeared over the body and face, which got worse and continues. The face is described as breaking out all over with scabs, &c.

The parents are healthy. The mother had a child by her former marriage which died from scarlet fever when one year and eleven months old.

Permit me to submit this case for further inquiry and inspection. If desired the mother will bring her child up to the Inspector. This will be less expensive than sending to her.

Yours, &c.

Bret Ince, Esq. J. H. LYNN.

Elizabeth Villa, Clova Road,
Forest Gate, London, E.,
16th April 1890.

A. G. H.'s case.

DEAR SIR,

I WROTE Mrs. G. urging her to reply to your letter, as I promised you. She consequently wrote me as follows:—

"You must think me neglectful not to write but I "really did not know how to answer that letter as I "told you all concerning my dear child, but now I "am encouraged to write to you that I have nothing "further to state except baby is much the same. One "day his face is better and seems as if it would be well. "The next perhaps all flowing with watery irritation. "He tears himself so with his little hands when they "are not tied. First it is on the face then forehead "then moves to near the ear. I do wish it was to get "well for there is no rest for me."

On Monday 14th instant she wrote a letter which was immediately passed on to me, and which says:—

"My dear baby is still suffering with his face. It is "much worse again . . . . I did not answer the "Secretary's letter for I did not know what more I "could tell him than I had Mr. Lynn. Whatever I "shall do with baby I do not know. He is ready to "tear his little face to pieces when his hands are loose "and I get but so little rest of a night."

If you add these extracts from her letters to the report I originally made to you, you will have all the information at my disposal in this case. She is poor and ignorant and a bad letter writer. I will get her to town and convey her to the inspector when you authorise me.

Yours, &c.

J. H. LYNN.

CASES 17–20, REPORTED TO THE COMMISSION BY MR. P. B. TRAVERS STUBBS.

Cases of C. T. (Case 17), J. H. (Case 18), K. F. B. (Case 19) and G. C. (Case 20): report to the Commission of Dr. Thomas Barlow.

Cases submitted by Dr. P. B. Travers Stubbs and examined at 331, King Street, Ravenscourt Park, W., on the 30th March 1890.

C. T., aged two years and four months, of ———. *Case 17.*

History from the mother. The child was healthy and was suckled for 11 months. He was vaccinated at the public station at ——— by Dr. H., on the 10th February 1888, from another baby's arm. Four insertions were made. During the first week the child did not suffer. He was taken for inspection at the usual time. The doctor said it was all right, but no lymph was taken. On the 19th February (the 9th day) the places spread and became mattery. On the 21st February (the 11th day) the child was taken to Dr. Stubbs who found the arm inflamed from the shoulder to the elbow and some enlarged glands in the armpit. The places took a month to heal. No abscess formed. No rash developed then or since. The child has been liable to occasional trouble from prolapsus ani but the bowels have not acted generally more than once a day. There has been no cough, and otherwise the health has been good.

Condition of C. T. when examined by me on the 30th March 1890. There are four vaccination cicatrices on the left shoulder which are not deep but are a little broader than usual. They measure three-quarters of an inch by half-an-inch or three-quarters of an inch by three-quarters of an inch. There is also a small supplementary cicatrix just above the other four. There are no enlarged glands in the armpit and the skin is free from eruption. The child has slight signs of rickets and is a little pale but otherwise healthy.

From the history and the appearance of the cicatrices there must have been slight excess of local inflammation in the vaccination sites. But there is no appearance of deep ulceration or of the child's health having been damaged. The case appears to possess no significance.

I. H., aged nine months, of ———.

History from the mother. The child was born on the 15th June 1889, and was healthy. When three weeks old she was vaccinated by Dr. L. with calf lymph, four or five punctures were made. The places died away and no mattery head formed. All traces had gone in a week. Nothing wrong was noticed afterwards. In September 1889 the child was vaccinated a second time. Four or five insertions were made. Calf lymph was used. The mother states that it had been stored in tubes. The punctures bled. The vaccination was considered unsuccessful. In eight or nine days all traces of the punctures had gone. Nothing wrong was noticed in the child at this period. Believes that about the middle of November, i.e., about two months after the second vaccination some boils appeared on the child. Two lumps appeared on the left buttock which afterwards subsided without breaking. Some others appeared on the legs and ankles. She thinks six or eight altogether. One burst spontaneously and formed again. One on the left buttock was opened by Dr. Stubbs to whom she brought the child on the 25th January 1890. Health otherwise good.

Condition of I. H. when examined by me on the 30th March 1890. The child looks very healthy and good tempered. Though only nine months old it can stand. There are three teeth and it has a small patch of stomatitis in the right side of the mouth, possibly connected with teething. There are no vaccination sites. The shoulder which was vaccinated shows no lesion whatever. There are no gland enlargements anywhere. There is a small blind boil over the left hip, but nothing else abnormal.

The small crop of blind boils of which there is one remaining can hardly be supposed to have been derived from the insertions of the second vaccination, seeing that there was no evidence of any true inoculation on that occasion. In about eight days all traces of the punctures had gone and at the time of my examination there was no abnormality whatever about the skin of the shoulder. The case appears to me devoid of any significance.

K. F. B., aged three years, of ———.

History from the mother. The child was born on the 18th December 1866, and was suckled two years. She was vaccinated when seven months old by Dr. B. at the ——— Surgery. She thinks a glass tube was used. Three punctures were made but two died away. One place "took," and at the end of a week the top got rubbed off so that the doctor took nothing from it. She was told to poultice it. The place healed in a fortnight, but left an itching place. The place was scratched and now and then a sore place formed. She did not attend a doctor until the last six weeks, when the place had begun to itch again. The present scabs have appeared within the last six weeks. Six or seven months ago some mattery heads appeared on the top of the child's head. These have never really healed. A few small dry scaly places have appeared on the trunk. Within the last few weeks the mother had noticed some festering of the sore places on the knees caused by a fall. There are four other children. The eldest is liable to recurring moist eruptions.

Condition of K. F. B. when examined by me on the 30th March 1890. The left shoulder shows an area about the size of a crown piece of impetigo with several small scabs over a moist surface. There are no enlarged glands in the armpit. On the scalp there are two areas of impetigo. There are a few spots of dry eczema on the trunk and some fleabites. On the knees there are brownish areas, which are the stains left by sores caused by falls. There are slight gland enlargements in the neck, probably caused by the impetigo of the scalp. The child scratches herself a great deal. Beyond the skin condition the child seems healthy.

Comments on Case 19.

The child's skin troubles seem to date from the abrasion of the solitary vaccination vesicle. From the mother's statements I cannot doubt that there has been great carelessness in the treatment of the recurring eczema and impetigo from which she has suffered. No attempt seems to have been made to cure or limit the local lesions and the child has not been kept clean (*vide* signs of fleabites). It is highly probable that she has an idiosyncrasy for impetigo and eczema, which the vaccination brought into relief. It is noteworthy that one sister is liable to recurring moist eruptions.

Case 20.

G. C., aged one year and ten months, of ———.

History from the mother and from Dr. Stubbs. The child was healthy at birth and suckled two months. It was not vaccinated until it was one year and four months old. Dr. Stubbs vaccinated with lymph from a tube obtained from Messrs. Maw. [Another child was vaccinated on the same day from the same source without any bad result.] Three insertions were made over the left shoulder. The progress was satisfactory in the first week. Three vesicles formed, each the size of the top of a cedar pencil. The child was not brought for another fortnight, and then it was found that the vaccination sites had become confluent, and fresh areas had appeared on the arm and one as low as the elbow. Dr. Stubbs describes these as like impetigo. They scabbed over. They healed in two months. Three or four patches appeared on the right shoulder and elbow of the same character. Dr. Stubbs cannot give the date, but believes it was three weeks after the vaccination. The child has been liable to itchy spots appearing on the trunk.

Condition of G. C. when examined by me on the 30th March 1890. There is slight pigmentation in the patches over the left shoulder (seat of the vaccination sites), over the left elbow and over the right shoulder; but there is no appearance of deep ulceration. There are no gland enlargements. There are some small reddish papules on the trunk. The child has slight signs of rickets, but is strong and vigorous. The heart and lungs are healthy. There are no signs of syphilis.

Comments on Case 20.

There seems little doubt that this was a case of impetigo brought about by the abrasion of the vesicles and the contagion of a weeping surface. In the above sense the vaccination must be considered responsible for the determining cause of the skin trouble. It is tolerably certain that if the mother had brought the child sooner to Dr. Stubbs, he might easily have prevented the dissemination of the skin affection by simple local treatment. It is noteworthy that the child's general nutrition was good throughout.

THOMAS BARLOW, M.D.

CASE 21 [SERIES], REPORTED TO THE COMMISSION BY MR. J. H. LYNN.

Case of E. M. S. and E. P.: report to the Commission of Dr. Theodore Dyke Acland.

General history of E. M. S.

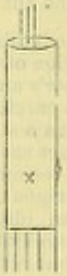
E. M. S. is the tenth child, nine of whom are living. One child died aged six months of bronchitis, the others are fairly healthy and seem not to have suffered in any way from vaccination. The father is not a strong man, he is suffering from an old pleurisy with thickened pleura and compression of lung, and his health is permanently impaired.

The mother seems and is reported by Mr. H., who knows both parents well, to be healthy. The child does not look healthy; she is too fat, with a pale opaque complexion, and is anæmic, but she is bright and not fretful.

Date of vaccination.

Vaccination was performed on the 12th February 1890 with fresh calf lymph obtained from Dr. R. Three tubes (numbered 1, 7—) were procured and used within four days of their receipt. Inoculation was performed by Mr. L. J., M.R.C.S., of ———, who was at the time acting as locum tenens to Mr. H.

In answer to inquiries, Mr. L. J. writes as follows: "Both cases were vaccinated with calf lymph, with two "or three tubes that came together from "London. A vaccinator such as I have "tried to draw here was used. H.'s for "E. P., my own for E. M. S. The in- "struments used in both cases had been "thoroughly cleansed by plunging them "in boiling water, and by running the "blades through a cambric handkerchief. "No precautions beyond these were "used."



Mr. H.'s "vaccinator," here mentioned, is one which, he tells me, he never himself uses on account of the difficulty of cleaning the needles, and though it has been in his possession for a considerable length of time it has only been used for the vaccination of the child E. P., and was not specially disinfected for that case.

The inoculation of the child E. M. S. was performed in four places on the upper part of the left arm. Two of the ulcerated areas coalesced. Mr. H. reports, and his statements are corroborated by Mr. and Mrs. S. (the father and mother of E. M. S.), that at the end of the first week the points of inoculation did not look healthy. The arm was much swollen and inflamed, there was a considerable amount of induration, and round the wounds, and Mr. H. considered that the child was suffering from erysipelatous inflammation. There was a scab on the surface of the ulcer which came off and left a depressed sore with raised sharply cut edges. After a few days it scabbed over again and has continued covered ever since. During the time that the ulcer was open there was a considerable amount of thin watery discharge, which ceased when the second scab formed.

During all this period the child never seemed really ill, but it was fretful; she took her food well, and there was never any difficulty in swallowing, or soreness of throat. No eruption of any kind was noticed on the body. The inflammation and induration of the upper part of the arm lasted for about two months, and was not seen by the gentleman who described the arm as giving every appearance of a "Hunterian chancre" until two months after inoculation. At this time the inflammation was subsiding, and the induration, which had been general over a large area of the upper and outer surface of the arm, was becoming circumscribed around the original points of inoculation. This induration, which had lasted for two months, has now (eight days after being seen and described as a "chancre") entirely disappeared.

Present condition, April 20th: On examination on the 20th April, 1890, there are three shallow ulcers, covered with light yellow adherent scabs, on the upper and outer part of the left arm. One of these, which is considerably larger than the other two, is formed by the running together of two of the original ulcers formed at the point of inoculation. They are surrounded by a faint areola, but there is no induration round or beneath them; on the surface of the skin between them there are thin flaky crusts and some shreds of epidermis partly adherent and partly peeling off. The whole appearance is that which would be expected after severe inflammation, which was rapidly getting well. There is no apparent inclination on the part of the ulcers to extend; and Mr. H., who has watched the whole progress of the case, agrees with me in thinking that the inflammation is over, and that the wound will shortly be completely healed. There is no enlargement of lymphatic glands to be detected either in the axilla or in the neck. There is eczema behind both ears and between the folds of fat on the neck. There are a few papules and vesicles on the flexor surface on the arm above and below both elbows, also eczema. Beyond this there is no general eruption on the surface of the body, and no evidence of constitutional or visceral disease.

Nature of lesion. The injury which followed vaccination in this case seems to have been from the first inflammatory, and I have failed to detect any evidence of inoculation with a syphilitic virus. The characters which lead to the sores being described as "Hunterian chancres" seem to have been derived from the fact that the inflammation, which had affected the whole area of inoculation, was rapidly passing away, and at the date, the 12th April, when examined was limited to the immediate neighbourhood of the sores.

Second case. E. P., aged six months, was vaccinated on the 13th February 1890, with a tube of the same calf lymph used for the child E. M. S., Mr. H.'s "vaccinator" was used (without disinfection) by Mr. L. J. On the second day after vaccination, according to Mrs. P., the mother, but towards the end of the week, according to Mr. H., a papular rash appeared on the limbs and trunk. This was said to be measles. There was, however, no catarrh at the time, and the other children in the house did not contract measles. The eruption lasted for a week, and then faded away. There was much swelling and redness round the points of inoculation, and the wounds did not heal for nearly two months. They are now firmly healed, and there is some slight induration round them. On both arms and neck there are a few scattered papules, looking like eczema, but no other eruption. The child has nasal and some bronchial catarrh, but is healthy looking, of bright eyes and of clear complexion. The mother does not notice that the child's health has in any way suffered from the effects of the vaccination.

Cases vaccinated with the same lymph. Through the courtesy of Dr. R., who supplied the lymph, it has been possible to communicate with all those who have vaccinated with the same lymph.

Dr. R. says:—"I always mix the whole yield of "a calf together; the tubes are filled from the inti- "mately mixed and triturated mass, so that all tubes "must be equal in every respect."

Schedule sent out. The accompanying schedule was sent out to those who had been supplied with this lymph, numbered 1712–1909 in Dr. R.'s register.

Name and address.
Number of invoice.
Number of vaccinations and date of vaccination.
Whether followed by rash.

And,

If so, of what kind, and what date.
Whether much surrounding inflammation.
Whether any slough; if so, whether any cause found.
Whether any sign of syphilis.
Method of performing vaccination.
Lancet; Needles.
Whether, if any inflammation, any disinfectants used.
Remarks.

Answers received, 121. Answers have been received from 121 doctors, who have each vaccinated with this lymph from one to 11 cases.

No record, 9. Nine, from one cause or another, had kept no record.

Satisfactory, 9. Ninety-six reports were wholly satisfactory.

Slight inflammation, 5. In five reports the results are pronounced satisfactory, though with "slight inflammation."

More serious complications, 11. In 11 reports the complications, though varying in degree, are of a more serious nature, and include—

Rash. Several cases of general rash, all, however, terminating favourably in a few days, with the exception of the case of one child, who had suffered from "alarming" inflammation, and is reported as still continuing ill.

One case of pustular eruption.

Inflammation. Two cases of "alarming," five of "severe," and eight of considerable inflammation.

Sloughing. In one case only inflammation was followed by "slight sloughing."

No transmitted disease. No permanent injury. In no case has any sign of syphilis been noticed, no case of death, and no case of permanent injury is reported, though one child at the present still continuing ill.

THEODORE DYKE ACLAND, M.D.

Case of E. M. S. and E. P.: supplementary report to the Commission of Dr. Theodore Dyke Acland.

The following supplementary information has been obtained from the 11 doctors who reported the more serious complications amongst the vaccinations performed with the same batch of lymph as that used for the vaccination of E. M. S. and E. P.:

1. Satisfactory.

One case reported by Dr. R. V. D. as having suffered from much inflammation entirely recovered without any mishap. The inflammation was never serious and was never sufficient to prevent the person vaccinated (a young adult) from going daily to business.

2. Satisfactory.

First report sent in by Dr. A. T., is misleading, it does not refer to the particular batch of lymph in question. All cases vaccinated with this lymph have done well.

3. Ultimate result satisfactory (two cases).

Two cases reported by Mr. E. as suffering from inflammation caused by the irritation of clothes, entirely subsided when the cause of irritation was removed.

Mr. E. adds:—

My results have been so satisfactory from calf lymph obtained from Dr. Renner that I would not vaccinate from arm to arm again at any price.

4. First report from Mr. W. H. P. states that he had "several cases of a rash following vaccination "with calf lymph, rash papular occurring about 9th, "10th, 11th, or 12th day. No bad results, though "once symptoms were alarming for a day or two." Subsequent inquiry elicits the facts that this had nothing to do with the batch of lymph in question, but occurred in 1886 a considerable time, as Mr. P. believes, before he was supplied with calf lymph by Dr. R.

5. Satisfactory (two cases).

Two cases reported by Dr. S. F. as having suffered from somewhat considerable inflammation. They both did well, and left ——— in March in perfect health.

6. Ultimate result quite satisfactory.

Two cases reported by Mr. A. G. C. as having suffered from papular rash distributed all over body, and a good deal of surrounding inflammation. In one case there was, too, a good deal of fever, the temperature reached 103°; the child had before vaccination suffered from intertrigo, and one brother and mother from eczema. In the second case there was a good deal of inflammatory induration, but in this case, as in the other, the inflammation was of only a very transitory character, and has been followed by no bad result.

7. Ultimate result satisfactory.

One case reported by Dr. H. G. W. suffered for three or four days "from very severe inflammation indeed"; two or three small sloughs formed, but the child made a good recovery.

8. Two cases; results satisfactory.

The two cases reported by Mr. C. as having suffered from (*a*) much, and (*b*) considerable surrounding inflammation, both recovered in a few days and have been in good health since.

9. One case; result satisfactory.

Case reported by Mr. C. A. on information received from mother as having suffered from inflammation from shoulder almost to elbow. It was not sufficiently bad for the mother to seek medical advice, and has since been seen by Mr. A., who says that it has not suffered any bad consequences and has remained perfectly well since.

10. One case; result satisfactory.

Case reported by Mr. G. R. as having suffered from a general pustular eruption. Now the child is *perfectly* well and has two good scars.

11. One case; result quite satisfactory.

The case was reported by Mr. J. W., February 17, as having suffered from slight sloughing under the scab. On July 22nd the child is reported to be in a perfectly healthy condition, and that it has been so since the time of its vaccination.

Summary of subsequent history of 11 cases vaccinated with calf lymph supplied by Dr. R., in February 1890, and reported as having suffered from some ill consequences.

First Report.	Ultimate Result
1. Much inflammation.	Satisfactory.
2. Report does not refer to this batch of lymph, all the cases vaccinated from it did well.	
3. *a*. Much inflammation.	Very satisfactory.
b. The same.	,,
4. Report does not refer to this batch of lymph.	
5. *a*. Somewhat considerable inflammation.	,,
b. The same.	,,
6. *a*. Inflammation considerable.	Quite satisfactory.
b. The same.	,,
7. Very severe inflammation indeed.	,,
8. *a*. Much inflammation.	,,
b. Considerable inflammation.	,,
9. Considerable inflammation.	,,
10. Pustular eruption.	,,
11. Slight sloughing.	,,

From the above it will be seen that of the 11 reports sent, in which more or less injury is attributed to the vaccination, two may be wholly rejected, as they do not refer to this particular batch of lymph. All the cases recorded in the remaining nine reports have suffered from temporary affections only, and are all now reported well, without any permanent injury.

THEODORE DYKE ACLAND, M.D.

CASE 22, REFERRED TO IN THE PUBLIC PRESS.

Case of J. S. An inquiry was made into this case by a Medical Inspector of the Local Government Board; and an analysis of his report is given on page 36, *where the case is numbered as Case CV.*

CASE 23 [SERIES], REPORTED TO THE COMMISSION BY MR. J. H. LYNN.*

Case of W. G. and others: provisional report to the Commission of Dr. Thomas Barlow.

On the 29th April 1890, I was instructed by the Royal Commission on Vaccination to visit at their own homes in villages near Norwich a series of cases of children recently vaccinated with untoward results.

My instructions were to visit as many of the cases as could be comprised in one day, and report provisionally upon them.

The cases had occurred within the district under the charge of Dr. M., but the vaccinations had been performed by his locum tenens, Dr. L. Dr. L. had left the district so that I was unable to communicate with him. My report therefore is based exclusively on my own observations and on the statements made to me by the parents, and it is provisional only.

I have to express my obligations to Mr. S. of Norwich, who furnished me with a list of the serious cases and greatly facilitated my inquiries. I learnt that two of the children had died; viz., W. W. W., of ——, vaccinated 12th March, died 1st April; and C. W. B. of ——, vaccinated 20th March, died 13th April.

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* *An inquiry was also made into this group of connected cases by a Medical Inspector of the Local Government Board; and a copy of his report is given on pages* 98–104.

Two of the group (W. W. R. and C. W. W.) are the same cases as those numbered as Cases CVIIa. and CVII. on page 37. *The Commission also examined a witness, the mother of the child C. W. W., as to one of these cases. See minutes of evidence of Mrs. A. Whiting, appended to the Commission's Sixth Report, Questions* 21, 454–64.

I saw the grandfather of W. W. B., and have embodied his account of the case in my report.

The children whom I personally examined were fifteen in number, and the following is the account of them:—

I.—W. G., ——. Account from the mother:—

The child was vaccinated in three places on the 20th March.

Next morning there was inflammation from the shoulder to the elbow.

On the 4th day the swelling and redness had extended down to the wrist, and on the 5th day down to the fingers.

The vaccination places festered and broke, but never formed proper heads. On the 8th day they were running sores.

No matter was taken from them by the vaccinator.

On the 4th April (15th day) a swelling appeared at the back of the left leg, which at first the mother thought due to a sting, but she looked in vain for any mark on the skin corresponding to a sting.

The swelling of the leg has greatly increased, and the child has been extremely fretful and feverish, but during the last fortnight seems to be less fretful than before.

Condition when seen by me on the 29th April (41st day):—

There are three vaccination sites on the left shoulder. Two present pale unhealthy granulations, and are partly covered with scabs.

There are no gland swellings in the armpit at present.

The left calf presents a large diffuse, shiny swelling, evidently a threatening abscess.

There is a large inflamed gland in the left groin.

The child is breast fed and well developed, but exceedingly pale and exhausted as though from a serious illness. She appears to me to have been well tended by the mother.

The mother appeared to be a healthy woman. One of her other children seen by me was healthy.

The cottage was clean.

II.—W. W. B., ——.

This child had died. I had an interview with the grandfather, and obtained from him the following statement:—

The child was illegitimate. He had no milk from the breast whatever. He was fed on bread and water, sweetened, and a very little cow's milk added.

He was vaccinated in three places on the shoulder on the 20th March. The places became very deep, but no abscesses formed. After discharging much matter the sores had become much less inflamed. The child began, however, to suffer from its breathing, and on the 13th April (the 25th day) he died in convulsions, aged four months.

III.—V. H. T., ——. Account from the mother:—

Vaccinated on the 20th March in three places, of which only two took. Next morning there was redness from the shoulder down to the elbow. On the third day there was a white fester to each place, and the heads were broken on the 7th day.

Ten days after the vaccination a swelling appeared on the inner side of the vaccination places, which burst about eight days ago.

About the same time another swelling appeared, which burst six days ago.

When seen by me on the 29th April (41st day), the child was eight months old.

There were two vaccination sites, one still covered with a scab.

From the other the scab had just dropped off. The places were quiet, but there was a small hard lump situated to the inner side of the vaccination sites.

This lump was the remnant of a small abscess which had imperfectly emptied itself and scabbed over.

There was also a small hard lump, the remnant of another superficial abscess, just above the left elbow.

There were no enlarged glands to be felt in the armpit.

There were several pimples of lichen on arms, legs, thighs and back, which the mother said were diminishing.

The child sat up well, but looked pale and sallow.

It had been suckled, but also fed on bread, butter, jam, and meat.

The mother was a pale, sallow, poorly-nourished woman.

IV.—H. G. F., ——. Account from mother:—

Vaccinated on the 12th March in three places. Within two or three days all three places discharged matter.

On the 30th March, *i.e.*, the 19th day, an abscess formed in the right armpit, which afterwards burst.

On the 4th April (24th day) the right knee began to swell.

On 21st April (41st day) the swelling around the knee burst in three places, and three days ago (26th April) another opening formed.

Within a week of the vaccination some small red spots appeared in different parts of the body when seen by me on the 29th April. (Child aged seven months.)

The three vaccination sites on the left shoulder presented rather deep cicatrices.

There was the scar of a healed abscess in the left armpit.

Over the front of the right knee there is some inflammation, thickening with three depressions above the knee cap. These depressions correspond with spots where, according to the mother's account, mattery discharge has escaped.

They are now dry.

Also below the knee there is a small depression from which, according to the mother's statement, matter has escaped.

It is now dry. It is clear that there has been an extensive inflammatory swelling of the soft tissue around the knee, but the joint itself is free.

Some of the glands in the right groin are enlarged.

There are a number of small spots of lichen on the arms, trunk, and lower limbs, but there is very little irritation in connexion with them.

The child is pale, and looks as if it had passed through a serious illness.

The mother seems healthy.

There is no evidence of neglect.

V.—F. H. W., —. Account from the mother:—

The child was vaccinated on the 12th March in three places. The places took, but did not form proper heads.

They began to "run" on the third day, and festered for three weeks, at the end of which time they healed.

The body became very hot and red on the eighth day, and continued so for three days. There was no scaling of the skin afterwards.

A swelling appeared in the left armpit on the 15th April (the 35th day), which has not yet gone down.

When seen by me on the 29th April (6½ months old), there were three rather irregular vaccination scars on the left shoulder, and two enlarged tender glands in the left armpit, but nothing else of importance.

VI.—N. D., ——. Account from mother:—

The child was vaccinated on the 12th March in three places. The places looked festery next morning, and there was some redness. On the 4th day all the places discharged. Within the week the whole arm was swollen up. The places continued to discharge till three days ago, *i.e.*, until the 46th day. No abscess or swelling formed.

When seen by me on the 29th April (the 49th day; child aged seven months), there were three vaccination sites from which scabs had not yet separated. There were no enlarged glands to be felt, and there was no indication of abscesses. The skin was clear.

Addendum.—The mother states that on the 29th March (17 days after the child's vaccination) her own fore-finger on the right hand ached and began to gather under the nail. Red lines spread up the arm to the armpit, but no lump was felt by the mother in her armpit. On the 15th April (18 days after) the swelling under the nail burst and discharged matter.

The mother attributes this place (which seems to have been a whitlow) to the finger being poisoned by the child's discharging vaccination sores. The finger is now healed (29th April).

VII.—S. F. K., ——. Account from mother:—

Vaccinated on the 12th March in three places. These places were very red the first night, and next day each place was in a head and broke. The places became very deep and discharged till one week ago, that is, till the 42nd day.

There was a swelling in the armpit after the first week, but it never came to an abscess. When examined by me on the 29th April (49th day; the child then aged 10 months), there were three vaccination sites with rather deep oval scars. There was no gland enlargement and no abscess.

VIII.—M. A. T., ——. Account from mother:—

Vaccinated on the 12th March in three places. On the fifth day there was a blister on each place which broke. There was much inflammation and much discharge. The scabs came off on the 30th March.

On the 3rd April (the 23rd day) a swelling came in the left armpit, which broke on the 6th April, and continued to discharge till the 23rd April (43rd day). Within one week of vaccination a few small white spots appeared on the body. These came and went, but gave no trouble.

The child was very weakly during the week after the vaccination was done, and again when the abscess was forming.

When examined by me on the 29th April (49th day; child aged six months), there were three vaccination scars, slightly irregular in shape, about ½ inch in diameter. There was the scar of an abscess in the left armpit, with a hard gland felt at the bottom of the scar.

The child was stout and fairly nourished. She had a few small spots of lichen on the body and a very little eczema of the scalp, which the mother states was present from the age of one month.

The mother seems healthy, and one other child seen seems healthy.

IX.—F. S. H., ——. Account from mother:—

Vaccinated on the 12th March in three places. The places began to fester next day and never formed proper heads. They discharged a great deal, but the redness was not greater than would be covered by a two shilling piece. A lump appeared in the armpit three weeks after vaccination, but this only remained two days. A few small hard spots appeared for the first time yesterday, the 28th April, on the left arm.

When seen by me on the 29th April (child aged four months; 49th day), there were three scars on the vaccination sites, but no enlarged glands could be felt. There were a few lichen spots on the right arm.

X.—L. A. H., ——, twin sister of the foregoing. Account from mother:—

The child was vaccinated in three places, but only one took. This never formed a proper head, but within two or three days formed a festering place.

On the 4th April (24th day) an abscess appeared on the left side of the neck, which broke two days after and soon subsided.

When seen by me on the 29th April (49th day), there was a long thin scar on the left shoulder, and a slight scar (the remnant of the small abscess) in the left fold of the neck. There was also a small hard nodule below this scar and a little superficial sore in the fold of the neck, probably caused by the friction of a small bib, which was fastened round this part of the neck.

XI.—J. M. M., ——. Account from mother:—

Child was vaccinated on the 12th March from a glass tube in three places.

The places did not come to a proper head, but began to fester on the third day, and continued to discharge for a month after that. One week after vaccination a small "tooth rash" appeared and spread all over the body and limbs, and gradually went away.

Three weeks after vaccination a swelling came in the left armpit, which became as big as a hen's egg, but it never broke, and by degrees went down.

The child had been suckled, and also bread and butter were given.

The parents were said to be healthy, and six other children were healthy. Some of these I saw.

Condition of child when seen by me on the 29th April (48th day; child aged 7 months).

There were three vaccination scars ¼ in. diameter each and rather deep. The crusts had separated. There was one small gland enlargement in the corresponding armpit. The child was healthy and had cut the two lower incisors.

XII.—R. J. S., ——. Account from mother:—

The child was vaccinated on the 12th March from a glass tube in three places, which took, but formed during the first week very small heads. On the 8th day some lymph was taken from them.

After the 8th day the places festered and discharged, and the arm became swollen and red nearly down to the elbow. The festering went on till the 9th April (28th day), then scabs formed, which separated on the 13th April (32nd day). No abscess formed in the armpit or elsewhere.

The mother states that the child was the seventh of her family, and was of full time. It had been fed after the first fortnight on milk and baked flour, at least one pint of milk daily, she says, at first. Subsequently on boiled bread with sugar and butter. She says that the child was well nourished until the vaccination, and that his bowels were not relaxed, but that the motions became a little green at one time.

After the first week of the vaccination he lost his appetite and has gradually wasted.

Condition when seen by me on the 29th April. There are three very small vaccination scars on the shoulder, and there is a little desquamation between them. There are no enlarged glands in the armpits. There is a little eczema behind the left ear, in the right groin, and around the arms. The child is emaciated to the last degree, and seems to have scarcely strength enough to suck the bottle.

I note that the milk in the bottle is quite sour.

XIII.—E. T. P., near the ——. Account from the mother:—

The child was healthy and breast fed.

On the 12th March he was vaccinated in three places on left shoulder. The lymph was taken from a tube. The same night the arm became red and swollen down to the elbow. The places discharged on the third day and continued to discharge till 14 days ago, i.e., for 34 days, then scales formed over them. On the eighth day the swelling and redness of the arm, and down to the fingers, were so great that the skin shone like glass. The child was taken for inspection, and some matter was taken from the places and drawn into a tube.

On the ninth day the redness had spread on to the chest. From this it gradually spread over the body and legs, and within one week it had affected the privates very badly, and had extended to the feet. There was more severe swelling about the privates and the thighs than anywhere else. No matter formed in these swellings. The child was very hot, but did not vomit.

The mother further states that 15 days ago she had to consult Dr. M., about her own left breast; severe pain occurred in it, and also down the left arm. But this seems to have soon subsided after weaning the child.

There are seven other children. The mother states that they are pretty well, except one little girl, who seven days ago had a small abscess at the back of the scalp.

Mother states that both she and her husband are healthy.

Condition of E. P., when seen by me on the 29th April (the 48th day).

There are three vaccination areas on the left shoulder. The scabs have separated and the areas are healed. Two are at least 1 inch in diameter.

There are slight gland enlargements in the armpit, but no indication of any abscess there.

The front of the chest and abdomen is somewhat scaly, an appearance like that left after erysipelas, and the scrotum is much swollen, dusky, red, and shiny, still showing the characters of erysipelas. There is slight glandular enlargement in the groins.

There is a little bronchitis. The child's general condition is feeble, but it has the aspect of improvement.

I note that the child is bottle-fed, and that the milk is rather sour. It is a very poor home; but there is nothing markedly insanitary to be seen.

XIV.—E. E. B., ——. Account given by mother:—

The child was vaccinated at ——— Post Office on the 12th March from a tube and in three places. Two days after two of the places which had taken swelled up and broke. There also occurred much swelling from the shoulder down to the elbow. The mother says the places were all right by the 12th April (the 31st day). No abscesses formed. About eight days after the vaccination a few small pimples came on the vaccinated arm, but they gave no trouble.

Condition when seen by me the 29th April. Child eight months old, rather pale but otherwise healthy.

There are two healthy vaccination scars on the left arm. There are no enlarged glands and no rash except a very few unimportant papules on the arm.

XV.—G. J. R. K., ——. Account from the mother:—

The child was vaccinated at —— on the 12th March from a tube, in three places on the left shoulder. The places were very slow in coming up. And only just began to show on the 8th day, but the arm was greatly inflamed.

On the 8th day lymph was taken from two places. One healed, the other afterwards gave rise to an additional sore and discharge. No other sores or abscesses formed and no rash.

Condition when seen by me the 29th April (48th day). There is one small normal cicatrix and there are two areas which are still scabbed over and look indolent. There is no rash or glandular enlargement.

XVI.—B. A. D., ——. Account from the mother:—

The child was vaccinated in three places on the 27th March.

On the third day the child was red all over, hot and restless.

Before the eighth day the vaccination places were discharging.

On the 25th April (30th day) some swelling in the left arm-pit was first noticed.

Condition when seen by me on the 29th April (36th day) then aged six months:—

The three vaccination sites were still covered with thick scars, two of them each half inch in diameter; one quarter inch.

There were three enlarged glands in the left arm-pit.

The child was somewhat rickety, but fairly nourished.

Analysis of these cases shows that the progess of the vaccination in some respects diverged from the typical course. Comm

In the majority there was a premature development of the vesicle, which within two or three days after insertion formed, broke, and discharged.

In several there was prolonged ulceration with free discharge, but not in the cases I saw any very deep loss of substance.

There was early and inordinate amount of inflammatory redness of the affected limb, and in some cases of the whole body.

In one case (XIII.) there was definite and severe erysipelas.

In two cases there was a large diffuse secondary abscess of the leg, which was very serious indeed, and accompanied by great exhaustion. I am informed that this condition was also observed in one of the fatal cases (C. W. W.).

In one case (No. II.) the local condition was, I am informed, distinctly subsiding, and there was no indication of secondary abscess; but the child died from convulsions. Also in XII. the local condition had quieted down, so that the vaccination sites were very small and scabbed over, and there were no indications of secondary abscess. But the child had sunk into a condition of marasmus with vomiting, and latterly green loose evacuations had been present. He succumbed the day after I saw him.

I think it important to observe that in both II. and XII. the feeding of these infants had been very bad.

For the most part, however, it is clear that the children had been previously healthy, and with two or three exceptions the mothers seemed to me to have been healthy. In two cases (VI., XIII.) there was reason to believe the mothers suffered from local inoculations from attending on their infants.

I saw no reason to think that the other children in the several cottages were unhealthy with one slight exception (XIII.).

The cottages were fairly wholesome. There was no proof of the family health having suffered previous to the vaccination. The infants vaccinated were, with a few exceptions, well tended.

I could not ascertain that there had been any infectious fever prevalent in these villages which could have modified the vaccination in an adverse way.

To sum up from the brief provisional investigation that I was able to make of these cases, it appeared to me obvious that some septic material had been introduced at the time of the insertion of the vaccine lymph, and that this was mainly responsible for the untoward results obtained.

Summary of cases.

Name of Child and Abode.	Date of Vaccination.	Early local Signs as detailed by the Mother.	Secondary Results.	Subsequent constitutional Conditions as observed by me.	Observations.
I.—W. G., ——	March 20	Early inflammation of the whole limb (day after vaccination). Early festering of vaccination sites (4th day).	Large diffuse secondary abscess of leg.	Wasting. Extreme pallor. Exhaustion.	Healthy mother, and, so far as I could judge, a previously healthy child.
II.—W. W. B., ——	March 20	Vaccination sites became very deep and discharged a great deal, and were subsiding for some days before the child died.	No abscesses	Wasted. Died from convulsions April 13.	Account was given me by the grandfather. The child was illegitimate. It was very badly fed. No breast milk. Bread and water, with very little cows' milk.
III.—V. H. T., ——	March 20	Early extensive redness—shoulder to elbow—on the day after vaccination. Vaccination sites festered on third day.	Small secondary: abscesses of arm.	Child sits up well, but is pale and sallow.	The mother is a pale, poorly-nourished woman. Child illegitimate.
IV.—H. G. F., ——	March 12	Vaccination sites discharged freely within 2 or 3 days.	Abscess in armpit on 19th day. Large diffuse abscess around knee 24th day.	Much pallor and exhaustion.	—
V.—F. H. W., ——	March 12	Vaccination sites discharged on 3rd day and festered for three weeks. Much redness of the body with feverishness on 8th day lasting 3 days.	Enlarged glands in armpit.	Fairly good.	—
VI.—N. D., ——	March 12	Vaccination sites festered day after vaccination, and discharged on 4th day. Whole arm swollen within the week.	No abscess	Fairly good	The mother got a severe whitlow on 17th day, attributed by her to inoculation from the child's discharging vaccination.
VII.—S. F. K., ——	March 12	Vaccination sites very red the first night and broke next day. Deep ulceration.	No abscess	Fairly good.	—
VIII.—M. A. T., ——	March 12	Vaccination sites formed blisters, which broke on 5th day. Much inflammation and much discharge.	Abscess in left armpit.	Stout and fairly nourished. Slight eczema of scalp which said to date from one month old.	—
IX.—F. S. H., ——	March 12	Vaccination sites festered day after vaccination.	No abscess	Fairly good, a few lichen spots on one arm.	—
X.—L. A. H., ——	March 12	Only one vaccination took place. This festered within 2 or 3 days.	Small secondary abscess in neck.	Rather a poorly developed child (twin). The fold of the neck has been irritated by the garment.	—
XI.—J. M. M., ——	March 12	Vaccination sites festered on the third day. Discharged for a month.	Large glandular swelling in the left armpit, but it never discharged.	Healthy.	—
XII.—R. J. S., ——	March 12	Vaccination sites festered after the 8th day (when lymph was removed from them).	No abscess	Great emaciation, condition of extreme of marasmus. Diarrhœa and vomitings have been present. Child subsequently died.	The mother states that the child was well nourished before vaccination. But it is certain that the feeding was very unsatisfactory. Boiled bread, sugar, and butter.
XIII.—E. T. P., ——	March 12	Arm red and swollen on the night of vaccination. Vaccination sites discharged on the 3rd day. Erysipelas of the upper limb on the 8th day. Subsequently erysipelas over body, with much swelling of the thighs and privates, but no abscesses.	Slight glandular enlargements, armpits. Erysipelas well marked still present, especially about thighs and privates.	Child feeble, but seems improving.	It appears tolerably certain that lymph was taken from this child on the 8th day, when the erysipelas had already appeared.
XIV.—E. E. B., ——	March 12	Vaccination sites swelled up and broke two days after vaccination. Much redness and swelling from shoulder to elbow.	No abscesses	Pale, but otherwise healthy.	—
XV.—G. J. R. K., ——	March 12	Vaccination sites slow in forming, but the arm greatly inflamed. After the 8th day, when the lymph was removed, one vaccination site healed, but the other gave rise to an additional sore.	No abscesses	Healthy.	—
XVI.—B. A. D., ——	March 27	Extensive redness and fever on 3rd day. Vaccination sites discharging before 8th day.	Three enlarged glands in armpit.	Child somewhat rickety, but fairly nourished.	—

THOMAS BARLOW, M.D.

Case of W. G. and others: addendum to the provisional report to the Commission of Dr. Thomas Barlow.

Having read through Dr. Thompson's report [*given below*] on the progress of the cases near ———, which report comprised continuous observations over several weeks, I find that our notes are in substantial agreement. I may also state that Dr. Thompson's investigations into the possible causes of the untoward results appears to me so exhaustive and complete that it is unnecessary for me to add anything to my provisional report.

THOMAS BARLOW, M.D.

Report to the Local Government Board on certain cases of Injury consequent on Vaccination in the S. District of the H. Union, by Dr. T. W. Thompson.

WHILE engaged in inspecting vaccinations in the county of ———— it came to my knowledge that certain vaccinations in the S. District of the H. Union had been attended with irregular results, and that the death of a particular child was referred to vaccination. Having reported the matter to the Board, I received upon April 10th instructions to make an investigation into the circumstances connected with the cases referred to.

The following are the results of my inquiry, which, as will be seen, involved a study of the whole 30 vaccinations performed at six different stations upon five several days, as follows:—

Union.	Station.	Date of Vaccination.	Number of Vaccinations.
H.	S.	March 5	1
„	„	„ 12	4
„	F. E.	„ 12	5
„	S. H. C.	„ 12	6
„	S.	„ 20	3
„	„	„ 27	3
„	N. F.	„ 20	2
„	„	„ 27	2
D.	F.	April 2	4

Mr. G. B. M. is the Public Vaccinator to the fourth or S. district of the H. Union, and to the seventh or H. district of the D. Union. His vaccination contract for these districts are dated July 23rd, 1889, and March 25th, 1889, respectively. He has at present no appointed deputy for the purposes of public vaccination.

The contract arrangements for his vaccinations are as follows:—

H. Union (fourth district), first and second Wednesdays in March and September, at 9 a.m., at the house of Mr. J. L. at S. A. S.

Second and third Wednesdays in the same months, at 2 p.m., at the house of Mrs. C., F. E.

Second and third Wednesdays in the same months, at 4 p.m., at the house of Mr. R. H. at S. H. C.

Third and fourth Thursdays in the same months, at 2 p.m., at the house of Mr. R. W. at S. N.

Third and fourth Thursdays in the same months, at 3 p.m., at the house of Mr. R. B. at N. F.

The vaccinations in the seventh district of the D. Union do not commence until April, and, as will be seen later, are only subordinately connected with this inquiry.

Towards the end of February Mr. M. was taken ill with an attack of influenza. Being unable to continue his work, he applied to a medical agent in London for a *locum tenens*, and on March 1st Dr. J. J. L. (M.D. and M. Ch. 1888, Roy. Univ. Irel.) arrived to take over his duties.

The H. vaccinations being about to become due, Mr. M. had written to the National Vaccine Establishment for some lymph with which to begin them, he having no stored lymph by him.

Accordingly on March 3rd two tubes of humanised lymph were forwarded to him from the National Vaccine Establishment.

Upon March 5th Dr. L. proceeded to the house of Mr. J. L. at S. (the appointed station), and there vaccinated the only child who, upon that day, was presented for vaccination, viz., E. G. W., aged 6 months (No. 63 in the vaccination register). The account of Dr. L.'s procedures with reference to this and other children which I am now about to give is based partly on the statements of a number of witnesses, partly on the statements of Dr. L. himself. The entries made by this gentleman in the vaccination register could not, it was found, be relied on.

The lymph used for the vaccination of the child E. G. W. was unquestionably from one of the two tubes supplied by the National Vaccine Establishment. Only half the lymph of this tube was used for E. G. W., and the tube was re-sealed.

Three insertions were made in E. G. W.'s arm, and all proved successful. Up to the eighth day the vesicles were unbroken, and the child's vaccination does not appear so far to have very markedly departed from the normal, except that the vesicles were regarded by the mother as retarded in their development, the arm being, however, at the same time inflamed.

Upon the eighth day, March 12th, a number of capillary tubes were charged from E. G. W.'s arm, and afterwards certainly three, and almost certainly all, of other four children, attending on this day for vaccination at S. station were vaccinated arm to arm from E. G. W. In these arm-to-arm cases the lymph was conveyed direct from vaccinifer to vaccinees in unsealed capillary tubes. After the inspection the child E. G. W. was taken straight home. On the evening of the same day the inflammation which, during the morning, had been observed around E. G. W.'s vesicles, was seen to have further increased. By the next day it had greatly increased — extending, in fact, from shoulder to elbow. The vesicles, according to the mother's account became, in the next few days, deep sores and discharged "a quantity of yellow bad smell-" ing stuff," and the child was at this time feverish. On the 11th day some axillary swelling was observed. By the 15th day, however, the inflammation of the arm had subsided and the places had crusted over. The axillary swelling was also subsiding. The scabs separated about the 29th or 30th day, leaving what are to all appearance three normal scars. The child has since done well, though she was for a time pulled down by her illness.

How many tubes of lymph were taken from E. G. W.'s arm on March 12th is a matter of considerable doubt, seeing that Dr. L. asserts that not more than four or five tubes were so charged, whereas Mrs. W. is sure that the number, exclusive of those used for arm-to-arm vaccinations, was not less than two. However this may be, it would appear certain that this lymph was mainly, if not wholly, employed for the 15 vaccinations which were, it will afterwards be seen, performed on March 12th, as it is clear it was all Dr. L. had to rely on upon that day, with the exception of the one tube and half tube remaining over of the National Vaccine Establishment lymph. What became of this National Vaccine Establishment lymph is not certainly known. Dr. L., despite the fact that in his vaccination register, he recorded all the children vaccinated on March 12th as having been done from E. G. W. has lately affirmed that some four or five of them, though which four or five of them he is unable to say, were vaccinated with this tube and half tube of National Vaccine Establishment lymph. Mr. M., however, is strongly of opinion that, before question as to this arose, Dr. L. made a statement to him to the effect that the second tube of National Vaccine Establishment lymph was accidentally broken or that something occurred which rendered it unavoidable.* As regards the lymph used for the later vaccinations we find that on March 19th three or four tubes of lymph were taken by Dr. L. from three children who had been vaccinated on the 12th.

Such tubes, along with those of E. G. W.'s, remaining over after the vaccinations of March 12th, and perhaps the 1½ tube of National Vaccine Establishment lymph, were available for the vaccinations on March 20th. On March 27th five tubes were taken by Dr. L. from two children vaccinated on the 20th, and these, along with any of the above-mentioned still remaining over, were available for the vaccinations on April 2nd.

* Among the few tubes left in Mr. M.'s hands by Dr. L. at the termination of his engagement, is a short, imperfectly fitted tube that may possibly be that which, after opening for the vaccination of E. G. W., was resealed by Dr. L. and retained for use on future occasions.

Thus while the vaccinations on March 12th may all have been done from E. G. W., it is tolerably certain that several performed after that date were not.

All tubes at the time they were taken were admittedly mixed with those already in hand, and no mark indicating their source was attached to them. Thus section 6 of the Board's "Instructions" of February 28th, 1887, which says, "In storing lymph be careful "to keep separate the charges obtained from different "subjects, and to affix to each set of charges the name "or the number in your register of the subject "from whom the lymph was derived," was entirely neglected.

As already stated, upon the 12th of March Dr. L. vaccinated four children at S. Upon the same day, in accordance with Mr. M.'s contract arrangements, he also proceeded to the vaccination station at F. E. and there vaccinated five children, going on afterwards to the vaccination station at S. H. C., where he vaccinated six more, making in all 15 children vaccinated by him on that day.

The result of the 15 vaccinations of March 12th were as follows:—

At S.: Four vaccinations, all probably with E. G. W. lymph.

No. 64. F. H W., aged 5 months, vaccinated in three places, which all took. Mother states that the places "did not come to regular heads," but "festered and began to run on the 3rd day." They became somewhat inflamed on the 5th day, but though the inflammation, which was its worst on the 8th day, lasted a fortnight, it was never very extensive, being limited to the locality of the vesicles. No axillary swelling occurred at this time. Upon the 9th day a rash described as having been something like "measles" appeared over the body. This had disappeared in three days. The places, Mrs. W. says, were never deep, but discharged some "yellow matter," which was not offensive. They had dried up at the end of the 3rd week, and the scabs separated a week later. During the inflammation period the child was somewhat feverish and ill, but not seriously so. No other complications had occurred at the time of my first visit (April 11th), but upon my calling again on April 21 (41st day), I found that the axillary glands, on the side of the vaccinated arm, were enlarged and tender. This had been observed some two or three days and was becoming worse. This child was not taken for inspection. No lymph was taken from its arm.

No. 65. S. F. K., aged 5 months, vaccinated in three places, which all took. The places "never came "to proper heads," but were seen to be running on the second day. Inflammation was observed around them as early as the evening of the day of vaccination. This was at its worst on the 10th or 11th day, when it extended from shoulder to elbow. The inflamed skin was swollen, but no blisters or subsequent desquamation were observed. The mother describes the places as having become "deep holes," and says they discharged "a watery sort of fluid which smelt bad." They, however, dried up about the 12th day, and the scabs fell off, says the mother, about the 15th or 16th day, when the places had healed. Slight axillary swelling had been observed, but no abscess formed either in the axilla or elsewhere. The child attended for inspection on the 8th day, but no lymph was taken from its arm. When I last saw it on April 21st the child appeared to be doing well.

No. 66. N. D., aged 5 months, vaccinated in three places, which all took. They were discharging on the 3rd day. The arm became inflamed upon the 4th or 5th day. The inflammation, which had not entirely disappeared until the first week in April, was at its worst on the 9th day after vaccination, when it extended from shoulder to wrist. No blisters were observed, but desquamation of the forearm afterwards occurred. According to the mother the places became "deep" and discharged considerably. No axillary swelling was observed and no abscess formed elsewhere. Upon April 21st (41st day), the places were still covered with soft ish yellow crusts. This child attended for inspection on the 8th day, but no lymph was taken from its arm. During the progress of the vaccination the mother suffered from a poisoned finger, presumably contracted from the child.

No. 67. H. G. F., aged 5 months, vaccinated in three places, which all took. They, however, "never "came to proper heads," and were discharging on the 2nd day. Upon this day also inflammation appeared around them. This was at its worst on the 8th day and died away during the next week. It was limited in extent to about two square inches. The places, according to the statement of the mother, became "deep," and discharged for a fortnight, though drying up by the 15th day. The scabs came off on the 32nd day and the places had then healed. Axillary swelling was observed on the 19th day after vaccination. This ran on to an abscess, which burst on the 24th day. On this latter day a swelling was observed in front of the child's right knee; here also an abscess formed and burst upon the 41st day,* discharging a considerable quantity of matter.

This child attended for inspection on the 8th day, but no lymph was taken from it.

[For summary of facts as to S. cases see page 103.]

At F. E.: Five vaccinations with lymph from stock containing multiple E. G. W. tubes and perhaps 1½ tubes National Vaccine Establishment lymph.

No. 68. S. M. T., aged 6 months, vaccinated in three places, which all took. They were discharging on the 6th day. Inflammation around the places was observed on the 4th day. It was most intense about the 8th day when it extended from shoulder to elbow, dying away on the 14th day. The inflamed skin was swollen and desquamation followed. The vaccination places dried up about the middle of the 2nd week, the scabs falling off at the end of the 3rd week, by which time the places had healed. Some enlargement of the axillary glands was observed about the 8th day, but no abscess formed. Since the end of the 2nd week the child has continued to improve. He was not taken for inspection on the 8th day as the mother was at the time suffering from influenza, and the child also was considered too unwell to be taken out, owing to the inflamed condition of its arm.

No. 69. B. H., aged 4 months, vaccinated in three places, which all took. They never "came to heads," but were discharging on the 4th day. Inflammation around the scratches was observed on the morning after the vaccination. In a few days this had spread down the entire arm to the wrist; it also extended into the neck and to some extent upon the chest. It was at its worst about the 8th day, and lasted till about the 22nd day. The inflamed skin was swollen, and desquamation followed, but no blisters were observed. The sores, according to the mother's account, were "deep" and discharged "nasty yellow "stuff" of offensive smell. Axillary swelling was noticed on the 12th day. This ran on to abscess, which was opened at the ———— Hospital on March 31st (20th day). The scabs came off the vaccination places about the 36th or 37th day, and at the time of my visit (April 22nd) the scars appeared perfectly natural. The axillary abscess, however, had not closed up, though the child was improving considerably in general condition. At this date there was observed just behind the lower and posterior vaccination scar a commencing small local abscess. The child did not go for inspection on the 8th day as she was considered too ill.

No. 70. C. W. W., aged 6 months, vaccinated in three places, which all took. They were discharging on the 5th or 6th day, about which time they were also slightly inflamed. The inflammation was at its worst about the 12th day, but was apparently not at any time of a serious character, being limited to the locality of the places. No desquamation followed. The vesicles dried up about the 15th day. No enlargement of the axillary glands was observed. On March 24th (13th day) the right leg was seen to be swollen just above the knee joint. This swelling steadily increased, extending up the whole length of the thigh, over the buttocks and up the back. The child became very feverish* and ill, suffering seemingly from considerable pain in the affected limb. Becoming rapidly weaker, he died on April 1st, the 21st day from the date of the vaccination and the 9th day from the appearance of the swelling of the thigh. During this illness he was attended by Mr. O. (assistant to Mr. G., of ——) who regarded the case as one of acute necrosis of the femur of septic origin and probably connected with the vaccination. The scabs upon the vaccination places had not separated at the time of death. The

* April 21st, the day of my last visit.

child was taken for inspection on the 8th day, but was not inspected, as Dr. L. was late in arriving and the mother would not wait.

No. 71. G. J. R. K., aged 6 months, vaccinated in three places, of which two took. The vesicles did not burst, but the mother states that they were "very "slow in coming up," and could only just be seen on the day of inspection. At that time there was a little inflammation around them, and this increased considerably during the next few days, attaining its maximum intensity about the 21st day, when it extended from neck to hand. No blisters or subsequent desquamation were observed. No abscess followed, neither was there any axillary swelling. The places were not particularly deep, and did not discharge much. The scab separated from one vesicle some time ago, but the other is still (April 21) (41st day) crusted over as also is a secondary vesicle which formed near. The child was taken for inspection on the 8th day and some lymph was taken from its arm—the mother thinks only one tube.

No. 72. E. E. B., aged 7 months, vaccinated in three places. Two only took. The vesicles did not burst. They were, however, inflamed on the 3rd day, the inflammation increasing up to the 12th day, when it extended from shoulder to elbow. The arm continued more or less inflamed up till the 25th day or so. The sores were stated by the mother to be deep, but not to discharge much. There was no axillary swelling or other complication. The scabs came off on the 37th day, and at the time of my visit, April 21st (41st day), the cicatrices did not appear other than normal, and the child was doing well. She was not taken for inspection on the 8th day on account of the inflamed state of her arm.

[For summary of facts as to F. E. cases see page 103.]

At S. H. C.: Six vaccinations with lymph from stock consisting of multiple tubes from E. G. W. and perhaps 1½ tubes National Vaccine Establishment lymph.

No. 73. M. A. T., aged 4 months, vaccinated in three places and all took. Upon the 5th day the vesicles burst and the arm became inflamed. Inflammation extended from the shoulder to a little below the elbow, and as well slightly over the chest. It did not die away until the end of the fifth week after vaccination, being at its worst during the fourth week. No blisters were observed upon the inflamed skin, but desquamation followed. Axillary swelling was noticed on the 23rd day and burst on the 26th day. At the time of my first visit (April 12th) a second swelling was observed at the outside of the elbow of the vaccinated arm. This appeared likely to lead to the formation of a second abscess, but when I visited the case again on April 21st it had disappeared. The vesicles which are said to have become "deep sores," dried up about the 14th day, but the scabs did not separate until about the 28th day.

A rash, which lasted two days, and is described by the mother as having consisted of "little red spots" spread all over the body two days after vaccination.

On April 21st (41st day) the axillary abscess was still discharging, but the vaccination places had completely healed, and the child was rapidly improving. She attended for inspection on the 8th day, but no lymph was taken from the arm.

No. 74. J. M. M., aged 6 months, vaccinated in three places, which all "took." They never came to proper heads, but were running on the 5th day. The arm inflamed on the 6th day, and by the 14th day the inflammation extended from shoulder to fingers, also up the neck and to some extent round the left side of the body under the arm. No blisters appeared on the inflamed skin, but the arm "peeled" from shoulder to elbow. The vaccination places were deep, and discharged "yellow water" of offensive smell. Axillary swelling was observed upon the 10th day, but no abscess formed either there or elsewhere. The places did not crust over till about the 35th day. By the 41st day (date of my second visit) two crusts had separated, but the third was still attached.

The child went for inspection on the 8th day, but no lymph was taken. She is now improving.

No. 75. E. T. P., aged 3 months, vaccinated in three places, and all took. The arm was red and swollen the next day, and the places discharged somewhat on the 3rd day. By this time the redness extended to the fingers, and by the 9th day it had spread over the abdomen and down the legs. The vaccination places are said to have become deep and to have discharged a quantity of offensive yellow matter. No axillary swelling or abscess elsewhere occurred. At the time of my first visit, on the 32nd day after the vaccination, the redness of the arm, abdomen, and legs had practically disappeared, and the places on the arm were crusted over. The penis and scrotum, however, were still considerably swollen, and a distinct erysipelatous blush covered the left side of the face. On the 41st day, when I again visited the case, the swelling of the penis and scrotum was subsiding, and the blush on the face was dying away. By this time the scabs had separated from the arm, and the places had healed. The child was improving in general condition.

This child was taken for inspection on the 8th day, and, notwithstanding the condition of it recorded by that date, lymph was (both mother and others affirm) taken from the arm, one if not two tubes being filled with it.

No. 76. R. J. S., aged 5 months, stated to have been vaccinated in four places, of which three took. The vesicles did not burst, and at the 8th day they appear to have been retarded. On the 10th or 11th day inflammation appeared round them, and a day or two later extended down to the elbow. This died away in the third week, and no desquamation was observed. The mother states that the vaccination places became very deep, "almost to the bone," and discharged a quantity of thick yellow matter. No abscess or axillary swelling occurred. The scabs separated from the arm about the 33rd day, leaving seemingly normal marks. This child, though a puny bottle-fed infant, is stated to have been in his usual health until the second week after vaccination, when he "took to shricking at night." He then became sick and unable to take his bottle. From that time to the present (April 21st) he has continued to waste, and is now in an extremely emaciated and feeble condition. Throughout his illness his bowels were constipated until April 19th, when his stools became more relaxed and green. From the evening of the 19th of April till the afternoon of the 20th he suffered from retention of urine, after which a spot of blood was seen at the end of the penis. At the time of my visit he had a papular rash about the buttocks.

Nos. 77 and 78. L. A. H. and F. S. H., twins, aged 3 months. These children were each vaccinated in three places. In the case of the girl (No. 77) one place only took; the boy's all took. Inflammation began around the scratches on the evening of the day of vaccination in both cases. This, however, never became severe, and did not exceed the size of a two-shilling piece at any time on the arm of either child. The vesicles all burst about the 3rd day. The scabs did not separate till the 6th week, but the resulting scars are normal in appearance. Slight swelling was noticed under the boy's arm for a day or two, but it soon disappeared. On the 23rd day after vaccination a swelling was noticed in the side of the girl's neck. This burst two days later. At the time of my visit the children appeared to be doing well.

[For summary of facts as to S. H. C. cases see page 104.]

This ends the cases vaccinated on March 12th. Upon March 20th Dr. L., having on the previous day inspected a number of children vaccinated on March 12th, vaccinated three children at the station at S. and two at that at N. F. These are also all recorded in the vaccination register as having been vaccinated from No. 63 (E. G. W.), but we have seen that upon March the 12th Dr. L. took lymph in tubes from three children, viz., Nos. 71, 75, and 76, which tubes were mixed with those previously filled from E. G. W. and those, if any, remaining of the National Vaccine Establishment lymph, so that it becomes impossible in these and in any others vaccinated later than March 12th to do more than surmise the lymph source in particular cases.

At S.: Three vaccinations with lymph from stock comprising tubes from E. G. W., tubes from Nos. 71, 75, and 76, and perhaps also 1½ tube National Vaccine Establishment lymph.

No. 79. V. H. T., aged 7 months (illegitimate), vaccinated in three places, of which two took. The vesicles did not break until the night of the 7th day,

* Temperature 105°.

when they were thought to have been injured by rubbing. The arm, however, is stated to have been inflamed down to the elbow the day after the vaccination. The inflammation lasted about a fortnight. There was no axillary swelling, but at the time of my visit two small superficial abscesses were pointing on the vaccinated arm. One was situated on the upper and anterior side of the arm over the long head of the biceps muscle, and the other on the outer side of the arm just above the elbow. The scabs were still attached to the vaccination places at the time of my visit (26th May). This child was inspected on 8th day, but no lymph was taken from her arm.

No. 80. E. A. W., aged 3 months, vaccinated in three places, but only one took. This vesicle did not burst. Upon the day after vaccination the arm was inflamed to some extent, the inflammation extending to the fingers by the 3rd or 4th day. The inflammation had abated by the day of inspection, but desquamation of the arm followed down to the hand. No axillary swelling or other complication occurred, and the child is now doing well. It was taken for inspection on the 8th day, but no lymph taken from it.

No. 81. F. E. E., aged 5 months, vaccinated in four places, but two only took. The vesicles did not burst. Some redness around the places was observed on the evening of the day of vaccination, and by the next day the arm was inflamed from neck to elbow. The inflammation, however, only lasted about two days, and was not followed by desquamation. The places dried up a few days after inspection (on the 8th day), and the scabs had fallen off and the arm healed by the 15th day. No axillary swelling or other complication occurred. No lymph was taken from the arm.

[For summary of facts as to S. cases see page 104.]

At N. F.: Two vaccinations with lymph from stock comprising tubes from E. G. W., tubes from Nos. 71, 75, and 76, and perhaps 1½ tube National Vaccine Establishment lymph.

No. 82. W. G., aged 4 months, vaccinated in three places, and all took. By the next day the arm was inflamed from shoulder to elbow, and by the 4th day the inflammation had spread to the wrist. This had subsided by the 8th day and was followed by desquamation. The vesicles burst on the 4th day. About the 9th or 10th day axillary swelling was noticed, but it did not suppurate. On the 16th day a slight swelling was observed at the upper part of the calf of the left leg. At the time of my visit (35th day) this was of rather an extensive character, and appeared to be pointing. The vaccination places had not dried up, and they were said to have discharged a quantity of offensive matter.

No lymph was taken from this child's arm.

No. 83. W. W. B., aged 3 months, vaccinated in three places, and all took. The vesicles burst on the 3rd or 4th day. Redness of the arm was observed on the 2nd or 3rd day, and by the 12th day the arm was inflamed from shoulder to elbow. The vesicles were said to have discharged a quantity of "matter." No abscesses or axillary swelling occurred. Subsequently the inflammation subsided, the places dried up, and the child was considered to be getting over its vaccination, when on April 11th (the 23rd day) it was seized with convulsions. The convulsions recurred more or less frequently until the morning of April 13th (the 25th day), when the child died.

[For summary of facts as to N. F. cases see page 104.]

The following further vaccinations were performed by Dr. L. on March 27th with tubes of lymph remaining over from the previous vaccinations. Such tubes consisted of tubes from E. G. W., tubes from 71, 74, and 75, and perhaps also the tube and a half tube of National Vaccine Establishment lymph. None were vaccinated arm to arm.

At S.: Three vaccinations with lymph as above stated.

Nos. 84 and 85. M. E. D. and T. F. D, twins, aged 5 months. Both these children were vaccinated in four places, and all the places took. None of the vesicles burst. Some inflammation was observed around the girl's vesicles on the 4th day, and by the 8th day this extended practically from shoulder to elbow. It then subsided. Slight inflammation of the boy's arm occurred. There were no other complications, and the scabs (with the exception of one on the girl's arm still attached on April 22nd) came off on the 4th day. The mother considers both these children to have done well. Two tubes were charged from the boy's arm and three from the girl's.

No. 86. R. M. M., aged 3 months, vaccinated in four places, all of which took. The vesicles did not burst, but about the 9th day the arm became inflamed. The inflammation spread from shoulder to elbow, but only lasted three or four days. No other complications occurred, and the places scabbed over about the 14th day.

The child was inspected on the 8th day, but no lymph taken.

[For summary of facts as to the S. cases see page 104.]

At N. F.: Two vaccinations with lymph as above indicated. No vaccinations performed here arm to arm.

No. 87. B. A., D., aged 5 months, vaccinated in three places, which all took. They were all discharging about the 4th day. On the 3rd day a rash, described as consisting of bright red dots about the size of pins' heads, appeared on the body and legs. This disappeared on the 4th day. The arm began to inflame on the 3rd day, the inflammation which did not subside till the 18th day, extending from shoulder to elbow. The vaccination places, scabbed over by the 18th day, and the scabs had not come away on the 28th day. There was no axillary swelling during the earlier stages of this case, but at my last visit on April 28th the axillary glands were enlarged and tender. This had only been observed two or three days.

No lymph was taken from the arm.

No. 88. T. S. K., aged 3 months, vaccinated in three places, and all took. The vesicles did not break, but the arm became inflamed on the 9th day from the neck almost to the elbow. The inflammation lasted about a week, and was not followed by desquamation. The vesicles dried up about the 15th day, and the scabs became detached 10 days later. About the 9th day slight axillary swelling was observed, but this soon passed off. No other complications followed.

The child was inspected on the 8th day, but no lymph was taken from its arm.

[For summary of facts as to N. F. cases see page 104.]

In addition to the above cases, which were all in the S. District of the H. Union, Dr. L. also vaccinated, on April 2nd, the following from children in the H. District of the D. Union. These cases were vaccinated with tubes of lymph remaining over from the previous vaccinations, and consisting of tubes from Nos. 84 and 85, perhaps of tubes from Nos. 63 (E. G. W.), 71, 75, and 76, and, perhaps also the tube or half tube of National Vaccine Establishment lymph.

No. 36. W. S., aged 12 months, vaccinated in three places, which all took. The vesicles did not burst. They were, it is stated, distinctly inflamed on the 9th and 10th days. There was no axillary swelling or other complication. The vesicles began to dry up about the 12th day, and the child did well. It may be questioned, in this case, whether the vaccination followed a course which was really abnormal.

No. 37. R. R., vaccinated in three places, and only one took. This case would seem to have proceeded normally, except that about the end of the second week a vesicular eruption appeared about the head and body. This was disappearing at the time of my visit on April 23rd, and the child was doing well.

No. 38. S. M. R., vaccinated in three places, and all took. The case appears to have proceeded normally.

No. 39. M. R., vaccinated in three places, of which two took. According to the mother, and judging from their appearance at the date of my visit, they proceeded normally.

Mr. M. having recovered from his illness, returned to work on April 7th, about which time Dr. L. left the neighbourhood.

Mr. M. then procured a fresh supply of lymph from the National Vaccine Establishment, and is continuing the vaccinations in the H. District of the D. Union. He informs me that the cases he has so far vaccinated are doing perfectly well.

In the above history there is unquestionable evidence of septic influence complicating vaccination. As regards the great majority of the numerous instances in which the course of vaccination departed from the normal there was coincident manifestation of vaccinia and of septic inflammation. Sometimes one, sometimes the other, constituted the earlier and predominant manifestation, but with few exceptions the septic symptoms were discernible within a very few days of the performance of the vaccination.

What may have been the nature and what the source of this septic element thus exceptionally complicating vaccination became, therefore, matter of minute study.

By way of clearing the ground for the consideration of this question it may be at once explained that careful inquiry was made as to the manner in which the vaccinated arms had been managed by the mothers; as to the health histories of the different children concerned, as to the sanitary conditions under which the several children lived, and as to the possibility of their vaccination having been modified by any concurrent prevalence of every-day zymotic disease. Generally the result of such inquiries was entirely negative. The cases could not be attributed to the use of shields, coloured ribbons, or other injurious applications; moreover, with one or two exceptions, the health histories of the children and their sanitary surroundings compared favourably with those of average rural populations. And I could learn of no prevalence of zymotic disease with the exception perhaps of influenza, which is still lingering in this county. Were influenza, however, capable of thus modifying in the above fashion the course of vaccination we should surely before now had ample evidence that such was the case in the large towns, in which weekly vaccinations were carried on throughout the whole progress of the recent epidemic. Furthermore, the vaccinations having been performed at five different stations there was little likelihood of diverse unwholesome conditions at these several places having been responsible for nearly identical results.

Thus by a process of exclusion a presumption became strengthened that a common cause of septic inflammation had been operating in concurrence with vaccination at each of five different stations, and upon several different occasions at weekly intervals; and by a reference to the summary of cases on pages 239–40 it will be at once seen that the facts are quite consistent with a common cause of this sort, operating with the greatest uniformity and intensity upon March 12th, continuing to operate uniformly though with diminished intensity on March 20th, and at later dates operating irregularly and with diminishing vigour.

Such cause in that it was thus closely associated with vaccination may have resided separately or collectively in the lymph employed for the vaccinations, in the operator himself, and in the instruments used for the operation.

I. The lymph.

It has already been stated that the original lymph with which these vaccinations were started was obtained from the National Vaccine Establishment. This lymph was contained in two out of six tubes of humanised lymph (No. 332K), received by the National Vaccine Establishment from the Public Vaccinator of the K. district of the W. D. Union. The remaining four tubes had been distributed equally to two Public Vaccinators, the one in Yorkshire, the other in Devon. Upon inquiry it was ascertained that the lymph in question had been made use of in both places with results entirely normal and satisfactory. Thus Dr. L., writing from Yorkshire, says, in reference to his vaccinations therewith, "The result was in every way "satisfactory," while Dr. H., writing from Devon, states that he "had very good results" from the lymph. With reference to the infant from whom this lymph was taken the K. Public Vaccinator reports as follows: "The vaccination followed the "normal course. 1. The child is very healthy. 2. Is "of healthy parents. 3. Is the second child. 4. The "other is also healthy. I did not vaccinate from this "child at the station, probably I had selected my "vaccinifers before its arrival, as I see by the register "I had ample choice on that day."

Of the total lymph, therefore, derived from this source that used by Mr. M.'s *locum tenens* was alone followed by untoward results.

The presumption is therefore strongly against the cause for which we are in search, having been inherent in the lymph with which the H. series were begun. But such cause, if not inherent in the lymph, may have been superadded thereto after its reception at S.

And first as to the child E. G. W. as a possible contributor to the lymph of septic quality. The W.'s are apparently a healthy family, and are all, including the particular child in question, L. G. W, stated to have been in good health at the time the vaccination was performed. They had not recently been away to other villages, or received any friends who could have carried infection to them; nor could I learn of any zymotic illness at the time in their neighbourhood. There existed no such unwholesome conditions in or around W.'s cottage as could readily be thought of as likely to have supplied the septic material in question.*

In reference to explanation by mere acceleration of E. G. W.'s vaccination. Should anyone advance the hypothesis that by the 8th day this child's vesicles had arrived at a stage of development usually observed some 24 or 48 hours later, and had somehow come by such means to contain puriform matter, and to be therefore unfit to supply lymph for the purposes of vaccination, it must be said that the evidence is against this. Both W. and his wife are decided in their opinion that judging by their previous experience in regard to the vaccinations of their other four children, the vesicles on the day of inspection were "not ripe," though they unite in affirming that they were then already distinctly inflamed.

The only fact coming to my notice which so far as the W.'s domestic circumstances are concerned, could be regarded as perhaps consistent with the notion that the lymph had acquired a peculiar quality from this particular child was that some two months before there had been chicken-pox in the village, and that the Ws. among others had suffered from it.

II. The operator himself.

As regards the method of operating employed there seemed to be no sufficient reason why the vaccinations should have done badly. This method was first to blow lymph from a tube on to the arm and then to make cross scratches or incisions through it with the particular instrument employed. The scratches as judged by the scars observed do not appear to have been of exceptional extent, and with very few exceptions they were found to be about half an inch apart.

The next important question which presents itself with regard to the operator is, of course, whether he could himself have acted as the passive medium for the conveyance of any septic material to the children vaccinated. I have made careful inquiries on this point, but have not obtained any evidence that such was likely to have been the case. Dr. L. assures me that he had not for some time antecedent to, during, or subsequent to the vaccination operations in question, any sores about his hands or elsewhere on his person; that so far as he knows he was entirely free from infection of every kind. Further, I could not learn that in his practice he had been exposed to any source of infection before the earlier vaccinations took place. Only two cases could I hear of which gave any grounds for surmise on this point. One, a case of uterine discharge, was excluded, in that it came under personal treatment at a date subsequent to March 12th.

The other, a case of so-called croup, but which was in all probability diphtheria, demanded a closer inquiry. For some little time during the progress of the vaccinations it appeared that Dr. L. had visited and examined the throat of this patient daily. It transpired, however, that this daily attendance did not commence until Friday, March 14th, *i.e.*, two days after the 15 vaccinations had been performed at S., F. E., and S. H. C. Dr. L. had, I found, seen this patient for a minute or so on Tuesday the 11th of March, but he did not upon that occasion examine the throat, nor did he again see the case until March 14th, and it is highly improbable that during that casual observation of the patient on the 11th he became and remained infected to the degree which would be required to explain the almost uniform septic infection of the 15 children vaccinated on the

* The lower walls of this cottage were certainly damp, and though the sink was "disconnected," the hole in the ground for the reception of slop water was nearer than need be to the dwelling. But, except perhaps in the matter of dampness, this dwelling hardly differed from the common run of labourers' cottages.

next day. Moreover, acceptance or this explanation leaves unaccounted for the observed abnormal course of E. G. W.'s vaccination which seemingly had commenced antecedent to Dr. L.'s first relation with the diphtheria case.

III. The instruments employed.

Coming next to the question of instruments, we are met with a difficulty, for certainly two, and probably three different instruments were used for these vaccinations, and Dr. L. is now unable to remember at which stations and upon which days he used each instrument.

None of them, it must be stated, are such as should have been employed for vaccination. They consisted of a gum lancet, a grooved needle, and a sharp eye spud, the two latter being in one handle. It is difficult to understand how such instruments came to be used at all. Mr. M. informs me that he pointed out to Dr. L. the lancet he was in the habit of using, but some misunderstanding appears to have occurred, and Dr. L. says that upon arriving at the S. vaccination station, he found the only vaccination lancet in Mr. M.'s pocket case broken, and that he therefore had no alternative but to follow the course he did. This can hardly be regarded as a sufficient excuse for using instruments of the antecedents of which he knew nothing. He might quite easily have procured a new needle. At the date that I examined these instruments they did not look dirty, but it was of course impossible to learn the purposes to which they had been last put.

A grooved needle that has been put to the customary purpose of such a needle is about as improper an instrument to be used in vaccination as can well be imagined. As to the gum lancet, it occurred to Dr. L. to mention that he had recently, since the vaccinations, to extract a tooth, and that he lanced the gum with the instrument he had been using in vaccination. In this promiscuous use of instruments there can hardly be a more liberal departure from the Board's instructions. Paragraph 9 of the "Instructions" of February 28th, 1887, says distinctly, "Keep "in good condition the lancets or other instruments "which you use for vaccinating, and do not use them "for any other purpose whatever." I should also record an independent testimony that Dr. L. made no profession to obey the Board's direction, as set forth in the "Instructions" above referred to, to cleanse his instruments between his operations upon successive children.

We have here, then, opportunity of septic poison being communicated in Dr. L.'s vaccination procedures.

It will be seen by the history of the case that no laboratory experiment can be made as to the presence or absence of this poison upon the instruments that were made use of. But after the information that has been got in this inquiry, it is hardly too much to say that by way of exclusion we are led to these instruments as the methods of infection; while, indeed, the conveyance of infection by this means supplies a hypothesis that fits to a nicety into the facts observed in the subsequent events.

We have only to believe that the unwashed, promiscuously used gum-lancet carried with it on March 5th or March 12th, or both, the material of septic disease as well as the lymph of cow-pox, and we find an explanation of all that was previously unexplained. There are some grounds for thinking of the 5th, and some for thinking of the 12th, as being the first occasion of the foreign infection. On a balance of considerations I am disposed to regard the earlier date as the more probable.

I ought, perhaps, before concluding this report, to mention that in one or two of the foregoing cases some constitutional or other complication seemed to be present and to have affected the course of the erysipelatous disease. In one instance there was a pretty clear history of syphilis in one of the parents.

Summary of cases.

"Burst" signifies vesicles broke before the eighth day. The signs mark the extent of the inflammation.

Thus:—

* *Inflamed around vesicles.*
† ,, *from shoulder to elbow.*
‡ ,, ,, ,, *and on neck or forearm.*
§ *Inflammation extending over body.*

VACCINATED AT S. ON 5TH MARCH 1890.

Lymph (N. V. E.).

No. 63.

Three insertions, all took.
None burst.
Inflammation 8th day.*|
Axillary swelling 11th day.
Lymph taken.

FIFTEEN CASES VACCINATED ON 12TH MARCH.

***Lymph mainly from** 63, **but four or five children** (not known which) **said to have been vaccinated with remaining** 1½ **tube** (N. V. E.).*

At S. Station.

No. 64.

Three insertions, all took. Burst.
Inflamed 5th day.*
Axillary swelling 39th day.
Rash on body 9th day.
No lymph taken.

No. 65.

Three insertions, all took. Burst.
Inflamed, 1st day.†
Slight axillary swelling.
No lymph taken.

No. 66.

Three insertions, all took. Burst.
Inflamed 4th or 5th day.‡
No lymph taken.

No. 67.

Three insertions, all took.
Vesicles burst.
Inflamed 2nd day.*
Axillary abscess broke 21th day.
Abscess, right leg, broke 42nd day.
No lymph taken.

At F. E. Station.

No. 68.

Three insertions, all took.
Vesicles burst.
Inflamed 4th day.†
Slight axillary swelling 8th day.
No lymph taken.

No. 69.

Three insertions, all took.
Vesicles burst.
Inflamed 2nd day.‡
Axillary abscess opened 20th day.
No lymph taken.

No. 70.

Three insertions, all took.
Vesicles burst.
Inflamed 5th day.*
Died of pyæmia 21st day.
No lymph taken.

No. 71.

Three insertions, two took.
Vesicles did not burst.
Inflamed 8th day.‡
Lymph taken, one tube?

No. 72.

Three insertions, two took.
Vesicles did not burst.
Inflamed 3rd day.†
No lymph taken.

At S. H. C. Station.

No. 73.

Three insertions, all took.
Vesicles burst.
Inflamed 5th day.†
Axillary abscess broke 26th day.
No lymph taken.

No. 74.

Three insertions, all took.
Vesicles burst.
Inflamed 6th day.‡
Axillary swelling 16th day.
No lymph taken.

No. 75.

Three insertions, all took.
Vesicles burst.
Inflamed 2nd day.§
Lymph taken, one tube.

No. 76.

Four insertions, three took.
Vesicles did not break.
Inflamed 16th day.†
Child wasting.
Lymph taken, one tube.

No. 77.

Three insertions, one took.
Vesicle burst.
Inflamed 1st day.*
Abscess in neck 23rd day.
No lymph taken.

No. 78.

Three insertions, all took.
Vesicles burst.
Inflamed 1st day.*
Slight axillary swelling.
No lymph taken.

FIVE CASES VACCINATED ON MARCH 20TH.

Lymph from stock consisting of tubes from E. G. W. (63), tubes from Nos. 71, 75, and 76, and perhaps 1½ tubes N. V. E. lymph.

At S. Station.

No. 79.

Three insertions, two took.
Vesicles broken 7th day.
Inflamed 2nd day.†
Secondary superficial abscess on arm.
No lymph taken.

No. 80.

Three insertions, one took.
Vesicle did not burst.
Inflamed 2nd day.†
No lymph taken.

No. 81.

Four insertions, two took.
Vesicles did not burst.
Inflamed first day.†
No lymph taken.

At N. F. Station.

No. 82.

Three insertions, all took.
Vesicles burst.
Inflamed 2nd day.‡
Abscess of leg.
No lymph taken.

No. 83.

Three insertions, all took.
Vesicles burst.
Inflamed 3rd day.†
Died of convulsions, 24th day.
No lymph taken.

FIVE CASES VACCINATED ON MARCH 27TH.

Lymph from stock consisting perhaps of tubes from E. G. W. (No. 63), perhaps tubes from Nos. 71, 75, and 76, and perhaps also 1½ tubes of N. V. E. lymph.

At S. Station.

No. 84.

Four insertions, all took.
Vesicles did not break.
Inflamed 4th day.†
Lymph taken, three tubes.

No. 85.

Four insertions, all took.
Vesicles did not burst.
Inflamed.*
Lymph taken, two tubes.

No. 86.

Four insertions, all took.
Vesicles did not burst.
Inflamed 9th day.†
No lymph taken.

At N. F. Station.

No. 87.

Three insertions, all took.
Vesicles burst.
Inflamed 3rd day.†
Rash on body and legs 3rd day.
Axillary swelling 31st day.
No lymph taken.

No. 88.

Three insertions, all took.
Vesicles did not burst.
Inflamed 9th day.†
Slight axillary swelling.
No lymph taken.

FOUR CASES VACCINATED AT F. IN THE D. UNION ON APRIL 2ND.

Lymph from stock consisting of tubes from Nos. 84 and 85, perhaps also tubes from E. G. W., from Nos. 71, 75, and 76, and 1½ tubes N. V. E. lymph.

No. 36.

Three insertions, all took.
Inflamed 8th day.*

No. 37.

Three insertions, one took.
Normal.

No. 38.

Three insertions, all took.
Normal.

No. 39.

Three insertions, two took.
Normal.

May 7th, 1890. T. W. THOMPSON.

CASE 24, REPORTED TO THE COMMISSION BY THE FATHER OF THE CHILD.

Case of R. M. R.: report to the Commission of Dr. Theodore Dyke Acland.

Vaccination. Vaccination was attempted three times in April 1888, according to the parents, by Dr. W., of ———, without result, and it was not until two months after this that a pustular eruption first made its appearance on the outer side of the left leg.

Present condition. The scars left by this eruption (May 1890) are circular, discrete, not merging into one another, not serpiginous in outline. They are white, slightly depressed, foveated with a very faint brownish ring round them. They look like the scars which might be produced by any severe pustular eruption, and are strictly limited to the place where they commenced. The parents do not know for certain how long the eruption lasted, but it certainly healed before the commencement of the affection of the eyes from which the child is now suffering. The inflammation of the cornea began about 15 months ago, and was much more severe at first than it is now. In the left eye there is a partially healed ulcer of the cornea, with considerable surrounding opacity. The right cornea is not quite clear, and looks as if there had been an ulcer which had healed. The conjunctiva, especially of the lower lid, is thickened, vascular, and granular. (See note by Mr. Juler given below.)

The teeth are sound, well formed, and good. There is slight beading of the ribs, and the lower end of the radii slightly enlarged. The frontal protuberances are unnaturally enlarged. There are some smallish, hard, cervical glands to be felt on both sides. The child is of the strumous rather than of the syphilitic type, and it is doubtful whether vaccination has had anything to do with its present condition.

Note by R. Maguire, M.D., F.R.C.P., Assistant Physician to St. Mary's Hospital.

"I have seen R. M. R. this afternoon (9th May 1890). "She has ulcers on both corneæ, which are, in my "opinion, of strumous origin, and I understand that in "this I am in agreement with my colleague, Juler. "There are on one of the legs the scars of ulcerations, "which also appear to me to have been strumous. Her "general health is now good."

Note by H. Juler, F.R.C.S., Ophthalmic Surgeon to St. Mary's Hospital.

"I saw the child R. M. R., aged 2½ years, at St. Mary's "Hospital this morning (9th April 1890). She is "suffering from superficial inflammation and slight "ulceration of both cornea. This affection is very "common in strumous children such as she is. I do "not think the condition has been in any way affected "or induced by vaccination."

The child's general condition is good; it is sturdily built, well nourished, and does not look ill. The defect of vision, owing to the opacity of the cornea, is considerable.

T. H. R., a brother of R. M. R., aged 13, the child mentioned in the father's report to the Commission, is thin and tall: is very liable to cold, and always has a cough in the winter. His chest is flat and badly formed. There is malformation of the costal cartileges on the left side, just below the mamma, with considerable depression. Expiration at the right apex is harsh and long, there is no sign of actual tubercular disease, but the boy is not strong, and his tendency is, I should imagine, towards some lung disease. His front teeth are quite regular, he has caries of the right lower molars. There is no ulceration of cornea, no interstitial keratitis, no enlargement of glands.

D. C. R., brother, aged 8, has a *healed ulcer* on the *left cornea*, which does not affect vision. The surrounding cornea is perfectly clear. Teeth irregular, the central incisors are well formed, without crescentic excavations, but have serrated edges. He is ruddy and sturdy.

G. D. R., brother, aged 7, vaccinated in London by Dr. S. Incisors serrated, right central incisor only just above the gums. Otherwise strong, sturdy-looking boy, with no sign of inherited disease.

G. R., brother, aged 5, vaccinated by Dr. S. Central incisors much serrated. Enamel very badly formed. No ulceration of cornea, no enlargement of glands, is ruddy and sturdy.

N. R., sister, aged 4. Said to be very well, and looks it. Has been vaccinated. Teeth good, the upper incisors are hatchet shaped, but not notched. No evidence of constitutional disease.

R. W. R., brother, aged 14. Tall and rather thin. Incisors regular. Some small glands under the left angle of lower jaw. No sign of constitutional disease.

J. R., brother, aged 15. Vaccinated in Wales with calf lymph. Has good health. Shows no sign of inherited disease.

Mrs. R., the mother of R. M. R., aged 36. Strong, stout, and ruddy looking. She says the only thing she has ever suffered from is lumbago. Had one miscarriage five years ago. But no other trouble of any kind.

Mr. R., the father, aged 37. Is not a robust looking man. Has poorly formed chest, and stoops, but he says that he has never had any illness except erysipelas two and a half years ago and some obstruction of the bowels, from which he entirely recovered. He absolutely denies having contracted syphilis.

According to Mr. R.'s statement no near relation on father or mother's side is known to have died of consumption.

R. M. R. is suffering from corneal ulcers, opacity of cornea and granular lids. She has suffered from a pustular eruption, the connexion of which with the vaccination I have not been able to trace. The affection of the eyes is probably unconnected with vaccination, but due to the strumous tendency which is largely shown in several members of the family, one brother having suffered from ulcers of the cornea, one from enlarged glands, one having badly formed chest and apparent tendency to tubercular mischief in the lungs, and four having teeth which show irregular development, such as is often found in strumous children.

Mr. R., has reported this case to the Commission, because he was anxious to get his youngest child vaccinated with lymph direct from the calf. I have assured him that this shall be done, and have communicated with Dr. Cory on the subject.

THEODORE DYKE ACLAND, M.D.

CASE 25, REPORTED TO THE COMMISSION BY THE FATHER OF THE CHILD.

Case of R. W. M.: report to the Commission of Dr. Theodore Dyke Acland.

Vaccination. R. W. M., the fourth living and youngest child of the present Mrs. M., was born on the 26th March 1889, and vaccinated on the 9th January 1890, with lymph supplied by National Vaccine Establishment. Vaccine preserved on points. Source of lymph unknown; no record having been kept by Dr. S. J., Public Vaccinator.

Delay of vaccination. It will be noticed that vaccination was not performed until the child was nearly eight months old. The father gives no adequate reason for this, but Dr. S. J. informs me that he believes the delay was really due to the fact that the child was suffering from eczema, and had some discharge from one ear. He obtained this information from Mrs. B., and he repeats the statement in a letter, of the 6th May 1890:—"I called on Mrs. B. this "morning, and she repeats the statement that the "child (R. W. M.) had eczema before it was vaccinated, "and, further, that Mrs. M. (the mother) informed "her that I had refused to vaccinate it on account "of the eczema, and that another neighbour, Mrs. M., "was present when she made this statement."

Method and course of vaccination. Vaccination was performed in two places on the right upper arm. Progress was quite satisfactory for six weeks, before which time Dr. J. was so satisfied with the result, that he had reported the vaccination as successful. At this time one scab still adherent was knocked off by accident. This accident was apparently the origin of the succeeding mischief. There was not any suppuration round the vesicles; they did not, and have not since, run into one another, although they are at the present time covered with one thick scab.

Although vaccination was performed in January, and the accidental knocking off of scab occurred six weeks later, and was followed by some slight local irritation, it was not until two and a half weeks ago (April 1890), four months after vaccination, that a general eruption was noticed upon the child's body.

Present condition. The child is (May 1890 very well nourished, large framed, clear eyed, and firm fleshed, intelligent, and forward for his age, and nearly able to walk. He looks well and happy, but is evidently suffering from the irritation of an extensive eruption. The whole body is covered with a papular eruption. In the middle of the back and over the sternum the eruption is confluent; it consists of raised, pale pink papules, in a few places exuding a thin watery secretion; in two places there are shallow ulcerations evidently produced by scratching, and not scabbed over. Over the lower part of the abdomen and back the papules are discrete and the rash is fading, and where it has disappeared there is no trace of pigmentation. There is exfoliating dermatitis over both cheeks and forehead, with well marked eczema of the head. On all these places there are dark thick adherent scabs. The child is suffering from acute eczema.

Physical examination. The vaccination scar has been one of the points on which the eczema has fallen with the greatest severity. The whole area of the two points of inoculation is covered with a thick, flaky scab, with copious watery exudation from beneath it. It measures now 1¼ by 1½ inches, and is surrounded by an areola measuring 2¾ by 1¾ inches. The whole of this area is in a very irritable and painful condition, and evidently causes the child great discomfort.

There is very slight beading of the ribs, the legs are sturdy, and the fibia are straight. The forehead is not unduly prominent, and the anterior fontanelle is all

but closed. There is no enlargement of abdominal viscera or of lymphatic glands. There are twelve teeth, all of them excellent.

Family history. The family history throws no light upon the origin of the eczema. The father, B. M., aged 47, was married when he was 19, and lost one child, 27 years ago, three weeks after vaccination, to which cause he attributes its death, but, as far as I could ascertain, without sufficient cause. He has never had gout, eczema, or syphilis, and is a well built man of excellent physique. He has three other children by his present wife, who is not strong, and who was supposed to be consumptive after the birth of her first child. Two children, B., aged four, and E., aged 3½, are strong and healthy looking, with excellent teeth. These two have not been vaccinated. B. C., aged 5½, has been vaccinated, and has had an abscess in his neck, and has now some few enlarged cervical and sub-maxillary glands. He had croup and bronchitis at two years of age. He had lost the right central lower incisor. The upper one is just coming through the gums, its edge is jagged, but not excavated.

Summary. The child R. W. M. is suffering from general acute eczema, from which it had apparently suffered before vaccination, and to which, therefore, it would have been liable had not vaccination been performed. The starting point of the present attack was the vaccination wound which was irritated by the accidental removal of the scab. The irritation on the body is considerably increased by the fact that the child is clothed in flannel next its skin, and to this cause a good deal of the irritation may be traced. Except for the eczema, the child seems to me of sound and good constitution.

THEODORE DYKE ACLAND, M.D.

CASE 26, REPORTED TO THE COMMISSION BY MR. J. H. LYNN.*

Case of M. D.: report to the Commission of Dr. Theodore Dyke Acland.

M. D., now (June 1890) aged seven years was vaccinated when four months old. She is the second of six children: the others are said to be healthy, and with no skin eruption.

On upper and outer side of left arm is the sore shown in the photograph forwarded by Mr. J. H. Lynn. This gives an accurate idea of the eruption; it measures 3¼ by 3¼ inches.

In the centre is a barely-closed sore, slightly raised on a cicatrix, which spreads out in a radiating manner to the periphery of the affected spot (*k*). The scabs at (*a*) and (*b*) have now fallen off.

The middle zone is almost clear of eruption, covered with thin skin and in part, especially the upper and outer, thickened with cicatrical tissue.

The outer zone is irregularly circular, and is composed of numberless minute papules, some becoming pustular, opaque, and yellow, and covered with crusts, which where thin are shiny and silvery, where thick are piled up into small, dirty, yellowish crusts.

The case is one of the lupus: chiefly affecting the skin, but there is no evidence to show whether it was invaccinated or merely an intercurrent disorder attacking a weak spot.

Account given by mother. Originally there were four vaccinatian cicatrices; two healed completely in about two years. The fourth has never got quite well, but a sore has gradually spread from the central point.

The child was under treatment at Great Ormond Street four years ago, and was subsequently affected with an inflammatory affection of the eyelids, which has not at any time interfered with the eyes themselves, or in any way injured the sight. This affection is very common in weakly children.

Mr. G. S. W., of ——, who performed the vaccination informs me:—

1. That he is not sure of the exact date at which the vaccination was done.
2. That he *does not know* the source from which the lymph came.

N.B.—It has been stated that it was calf lymph, but inquiry does not confirm the statement.

3. That undoubtedly other children were vaccinated with the same lymph, but with no bad result.
4. That the vaccination scars have never been completely healed.
5. That he does not remember when his attention was first called to the lupus, but believes it commenced in one of the cicatrices.
6. That the sore has never been properly healed, and
7. That the parents have objected to its being vigorously treated.
8. That no other child in the family has shown any symptom of tubercular disease.
9. That on two occasions the lupus has nearly healed, that on one occasion as soon as this occurred the eyelids have been affected, and
10. That on the other the patient suffered from eczema of the head.

The child is rather delicate looking, but otherwise there is no sign of organic disease. There are some slightly enlarged lymphatic glands in the left armpit, due, doubtless, to the lupus.

Family history. Mrs. D., the mother, is a healthy-looking woman. She has had no miscarriages, and has lost no children.

Mr. D., the father, aged 33, is said to be strong and well. There is no history of tubercular disease on either side of the family.

The child has on two subsequent occasions been in St. Thomas's Hospital for treatment under Dr. Payne and Mr. Anderson; on the 17th April 1894 the lupus was still continuing to spread at the circumference of the old cicatrix.

THEODORE DYKE ACLAND, M.D.

CASE 27, REPORTED TO THE COMMISSION BY MR. J. H. LYNN.

Case of E. S. S.: report to the Commission of Dr. Thomas Barlow.

E. S. S., aged six months, of —— ——.

History given to me by the mother. E. S. S. was the seventh child, was full time and brought up by hand from the age of one month. He was delicate as an infant, and attended at University College Hospital from the age of two months to three months old with bad cough and attacks of vomiting. He was vaccinated when three months old, on the 1st April 1890, by Dr. C., at the —— vaccination station. He had just ceased attending at University College Hospital. He was vaccinated in five places, and at the end of a week lymph was taken from them, and the places looked well. The scabs dropped off three weeks after the date of vaccination. The child did not appear feverish. Six or seven weeks after the scabs had dropped off it was noticed that the child was tender in the left arm-pit, and the skin became purple in this situation. The mother thinks it was about the 1st of July when the child was taken to the Temperance Hospital. An incision was made in the swelling on the 3rd July, and on the 4th small incisions were again made by other doctors, and the child is still attending the Temperance Hospital. The mother has had six other children. One of these was a seven months' child, and only lived a few hours; another was an eight months' child and suffered much from bronchitis; another only lived five weeks. The parents seem tolerably healthy.

Condition of the child when seen by me on the 10th July 1890. There are five normal vaccination cicatrices on the left shoulder, not larger than a quarter of an inch in diameter. Two small incisions have been made in the left arm-pit from which there is a little thin mattery discharge, the remains of an abscess, and three enlarged glands are to be felt. The child has a slight eruption of lichen on the limbs and back, is ricketty, and has beaded ribs and some thickening of the skull bones. There is no enlargement of the spleen. He is a cheerful child, a little hoarse.

Vaccinifer and sub-vaccinee. I obtained from Dr. C. a copy of his register, from which it appeared that E. S. S. (No. 445) was vaccinated on the 1st April 1890, the vaccinifer being No. 441, M. F., of ——. E. S. S. was the only one vaccinated from M. F. E. S. S. was brought for inspection on the 8th April, and O. W. (No. 451), of ——, was vaccinated from E. S. S.; and none other. These cases were all successful.

Vaccinifer I visited M. F., the vaccinifer, at her residence on the 11th August 1890. I was informed by her mother that the child had been vaccinated in five places; that all the places were successful; that lymph was taken on the eighth day. For one week or more after this

* *The Commission examined a witness, the father of the child M.D., as to this case. See minutes of evidence of Mr. David Dakers, appended to the Commissioners' Sixth Report, Questions* 21,219-83.

there was redness down to the elbow, but the scabs cleared off in one month. Some red spots appeared on the face, trunk, and limbs within a day or two of the removal of the lymph, but they did not form matter, or itch, or give any trouble. A few crops came out, but the child was well otherwise. When I examined this child, M. F., on the 11th August 1890 there were five vaccination scars on the left shoulder; normal. There was no gland enlargement in the arm-pit. There were a few very superficial small red papules on the trunk (lichen). The child was fairly healthy; slight rickets; was fed partly at the breast and partly by hand.

The sub-vaccinee (vaccinated from E. S. S.) O. W. had removed from her former residence and could not be traced.

With respect to E. S. S. it would appear that the vaccination proceeded normally. There is no reason to suppose that the lymph which was withdrawn from M. F. was at fault. There was no excess of re-action in E. S. S.'s case, or ulceration; nevertheless, probably some glandular enlargement in the arm-pit was set up by the vaccination; and the abscess which subsequently formed was doubtless due to this. The statement forwarded by Mr. Lynn to the Commission, and appended to this report, to the effect that the child was previously quite well is not correct. He was the seventh child of a woman in poor circumstances who had her children quickly; he was hand fed, and had attended for the month immediately preceding vaccination at University College Hospital on account of bad cough with vomiting. He was probably in rather poor condition when vaccinated, and this was very likely one reason why the glandular irritation, which is not infrequent in connexion with vaccination, did not subside but gave rise to subsequent abscess.

THOMAS BARLOW, M.D.

(Copy of statement forwarded by Mr. J. H. Lynn.)

E. S. S., of ——. This child was born 1st January 1890, vaccinated 1st April by Mr. C. C. C., M.R.C.S., Public Vaccinator, —— at —— vaccination station. He was previously quite well. About six weeks subsequently to vaccination the child showed signs of pain and cried when lifted. June 26th a serious lump was noted under the arm which grew larger. On the 1st July he was taken to the Temperance Hospital. The doctor who saw it dressed it on Tuesday 1st and Wednesday 2nd. On Thursday 3rd inst. it was lanced by another doctor. The following day another doctor dressed it, who (to-day, 5th July) again lanced it. This severe axillary abscess seems very manifestly the result of the vaccination. The parents are healthy and the other members of the family. Two have died—one of them from scarlatina, and one, a weakly child, lived only five weeks.

5th July 1890.

CASE 28, REPORTED TO THE COMMISSION BY MR. J. H. LYNN.

Case of R. P. Copy of a letter received by the Commission from the medical man under whose care it was stated that R. P. had been.

SIR, July 10th, 1890.

IN answer to your letter of the 8th instant I beg to state I did attend a child of the name of R. P., aged six months, on September 28th 1885 at————, as a patient of the———— Dispensary. She was suffering from phlegmonous erysipelas of the arm, abscess in the axilla, after vaccination.

I have no recollection of the eye trouble. I called upon the mother of the child yesterday, and saw the child.

The mother stated that the child had weak eyes and unable to open the eye *before* I attended the child for the erysipelas, and the eye got worse *after* the erysipelas of the arm. She went at my suggestion to an eye hospital under Mr. P., but after a fortnight's attendance went to the Eye Institution under Mr. R. C., and then to the———— General Hospital; all the surgeons gave a favourable prognosis—that in time something could be done. At present I am of opinion that the child's eyesight could be restored by operation, and that the loss of sight was not due to erysipelas of the arm. I have advised the mother to take the child immediately to the———— Eye Hospital under Mr. R. C., and should I hear any further concerning the case I shall report the same to you.

I am, &c.,
G. S. P., L.R.C.P.Ed., L.R.C.S.Ed.,
Deputy Vaccinator (Public) ————,
Surgeon to———— Dispensary.

Bret Ince,
Secretary,
Royal Commission on Vaccination.

CASE 29, REPORTED TO THE COMMISSION BY MR. J. H. LYNN.

Case of I. B. R.: report to the Commission of Dr. Thomas Barlow.

I. B. R., aged three years and eleven months, of ——.

History given to me by the parents. Both the parents healthy. There is no skin eruption in either of them. This is the only child; it was born at full time, suckled eleven months, the mother in good health at the time. Born on the 9th September 1886, and vaccinated in April or May 1887, by Dr. B. A tube was used, and the lymph, according to Dr. B., had been taken from a healthy country child. Two insertions were made and they both took; the parents do not think anything was taken from it. Everything seemed to go well; there was no undue redness, no abscess or painful swelling, although the scabs had completely cleared off before any rash appeared. About six weeks or two months after the vaccination a rash appeared on the trunk and arms which the mother says resembled vaccination; she cannot be certain of the dates. The rash was shown to the doctor, who (the mother says) at first suspected small-pox, and asked why it had not been shown him earlier. Several places appeared in other parts of the body. The child was hot, but there was no vomiting or cough. Mattery heads appeared as big as peas; they scabbed and then the scabs dropped off and left red places. Fresh places appeared for twelve months. Within that time some came under the nails of the feet and hands, and some of the nails came off. Some of the sore places required pricking, and watery stuff came away from them. Within the last six months the rash has taken the character which it has now; hard itching pimples appear in groups in the face, limbs, and trunk. The appetite is bad when the pimples come out; nevertheless the child has grown well.

Condition of the child I. B. R. when examined by me August 1890. There are two vaccination scars on the shoulder which are quite normal, a quarter of an inch in diameter. No gland enlargements in the armpit. There are many spots of lichen situated on the trunk, thighs, legs, feet, and arms. There is one small bulla on the thumb. There are no gland enlargements, and the sore places described by the mother have left no signs of ulceration on the body. The child is a little feverish. She has a slight sore throat (follicular tonsillitis). Her general nutrition is good. There is no sign of syphilis.

Comments.

It is to be noted that the recollection of the parents as to dates is confessedly incomplete. They are quite clear that the course of vaccination itself was free from trouble, and the appearance of the vaccination scars is consistent with this. The child appears to have suffered from an aggravated attack of impetigo, but there was, according to the parents' statement, an interval between the complete disappearance of the vaccination scabs and this rash. Assuming this to be correct, such an interval makes it unlikely that the rash was due to septicæmia on the one hand, or to contagion from the vaccination pocks on the other. It is also noteworthy that there were no foci of deep suppuration, and that none of the skin lesions ulcerated. The itching pimples now present on the body are examples of a common rash in children called lichen urticatus. The case resembles many others which have been reported to the Royal Commission. It cannot be affirmed that vaccination did not act as a determining or precipitating factor in bringing about the eruption. But it is to be remembered that such eruptions occur in children who have never been vaccinated, and in children who have been vaccinated but at periods so distant from the date of vaccination that the vaccination cannot be considered to have any part in producing

them. In the case of I. B. R., there is no evidence of constitutional disease; the tonsillitis from which the child is now suffering being evidently a slight intercurrent ailment.

Appended is a letter from Mr. Lynn concerning the history of the case.

THOMAS BARLOW, M.D.

(Copy of letter from Mr. J. H. Lynn.)

34, Clova Road, Forest Gate, E.,
23rd July 1890.

DEAR SIR,

THE following case, which I beg to submit as one for medical inspection, has been reported to me.

I. B. R., daughter of Mr. E. H. R. of————, was born on the 9th September 1886, and vaccinated in April or May 1887, by Dr. B. of————, from a child's arm. Before the operation she was quite well. About six weeks afterwards an eruption appeared all over her, of spots precisely similar to vaccination spots, attended with great irritation, restless at night, fever and loss of appetite. She has suffered more or less to the present time. The parents are healthy, and report "no sickness or disease on either side." I. B. R. is the only child. Dr. B. pronounced the eruption eczema, and that it would pass away with dentition. This hope was disappointed. She was then taken to Mr. A. G., M.D. He said, from a large experience, he was sure it was not eczema but was of opinion that it was a clear case of blood poisoning from vaccination. He attended her for nearly two years; and is now of opinion that it will be a long time before the disease is eradicated from the system. "The poor child's sufferings," her father writes, "have been very great, for a fortnight together "we have been unable to dress her and many sleepless "nights have been passed. At the present moment "she is full of spots, though not of the same horrible "nature as during the first twelve months, nevertheless they are very irritable and cause the child to "become feverish, especially during the night."

I have no doubt, if the Commission desired it, that one of the parents would come up from———— with I. B. R. for the convenience of the Medical Inspector.

I am, &c.

Bret Ince, Esq. J. H. LYNN.

CASE 30 [SERIES], REPORTED TO THE COMMISSION BY MR. J. H. LYNN.*

Case of L. B., M. W., E. A. J., E. A. and A. J. T.: report to the Commission of Dr. Thomas Barlow on L. B., stated to have been the vaccinifer of M. W., E. A. J., E. A. and A. J. T.

L. B., aged 12 months, of ————.

History given to me by the mother. The child was born on the 27th July 1889; the ninth child of the family; has been suckled and has had bread and butter besides. The child was well till it was vaccinated on the 19th April 1890 (8½ months old). A tube was used and two punctures were made. The places took well; there was no trouble, no redness beyond the places, and no swelling in the armpit. She was taken for inspection at the end of a week, and five children were vaccinated from her. The day after there was redness from the shoulder down to the elbow, and this extended during the next week half way down the forearm. The vaccination places deepened and discharged. The mother thinks the scabs came off in six weeks after the vaccination. She saw no lump in the armpit and no abscess. One week after the lymph was taken from the arm there was an appearance of cold in the eyes; they were red and swollen. The left eye was much worse than the right. The swelling of the left eyelids bulged up a great deal; there was mattery discharge from the left eye, but only watery discharge from the right. The right eye was well, she thinks, within a week, but the left became closed up in consequence of the swelling, which lasted for a month; a little matter escaped from it throughout this time. After a month it began to mend. There was nobody ailing in the house at the time; the father and mother and eight other children were well. There were three rooms to the house. Water was obtained from a well. There was an open drain in front of the door. A fortnight ago a little watery discharge appeared above L. B.'s right ear.

Condition of the child L. B. when examined by me on the 25th July 1890. There are two vaccination scars on the left shoulder about half an inch in diameter each—no enlarged glands in the armpit. There is a little eczema behind and above the left ear; enlarged glands in the neck; a little eczema on the left cheek. The left eyeball is movable but is extensively disorganised; there is an extensive anterior staphyloma—that is, a mass of granulations has prolapsed through the anterior chamber and the cornea. The eyelids are very granular and swollen—the right eyeball natural. The child is somewhat ricketty.

Comment

My instructions from the Royal Commission are to report on this case so far as an examination of the child only permits. The history would seem to show that the vaccination proceeded normally until after lymph was removed from the child's arm on the day of inspection; there then developed a considerable amount of inflammatory redness down the arm, and the vaccination punctures appear to have taken on an ulcerative character. Although this does not appear to have been very deep, yet there was a considerable amount of discharge, and it seems probable that contagion took place in respect to the eyes from the discharging vaccination wounds. It is noteworthy that the eye which was nearest to the vaccination wounds suffered most. The condition now found in the left eyeball resembles that which is produced by virulent infective inflammations. It seems probable that some form of septic material obtained entrance to the child's vaccination punctures, either at the time of the removal of the lymph or very soon afterwards. The patches of eczema now present may easily have been started in connection with the eye troubles.

Addenda

The report made to the Local Government Board on M. W., one of the children vaccinated from L. B. (see the analysis of the report on page 41, Case CXVIII.), shows that in all but one of the sub-vaccinees the course of vaccination was abnormal; abscess, and varying degrees of inflammation occurred, and one sub-vaccinee died of erysipelas and septicæmia. Erysipelas was notified in the village, and many cases of typhoid fever had occurred in the preceding four months. One case of erysipelas had come to the vaccinator's surgery.

THOMAS BARLOW, M.D.

CASE 31, REPORTED TO THE COMMISSION BY MR. J. H. LYNN.

Case of W. H.: report to the Commission of Dr. Thomas Barlow.

W. H., aged eleven years and two months of, ————.

History obtained from the mother. The child was full time and suckled for ten months, and in good health until he was vaccinated at eight months old. He was vaccinated by Dr. B.'s assistant. The mother says that the lymph was taken from a small bottle, placed on a glass square, and then the lancet dipped into it. Three punctures were made on the left shoulder; no other child was vaccinated at the time. The next day the child seemed bodily ill; it was feverish and did not take the breast properly. The doctor attended it for three weeks. The vaccination places never came up properly; they did not form mattery heads; there was only a small mark where the punctures had been made, and a very little redness around it. Within nine days other spots came out; one on the chest first; about half-a-dozen altogether. At the end of three weeks they were getting on nicely, the doctor said; he begged her not to get them rubbed. The mother thinks they had disappeared at the end of a month. With respect to the right eye the mother noticed that the eyelids were swollen by the third or fourth day after vaccination; the eye remained closed for three weeks; it was poulticed and bathed with warm milk. When the eye was opened after three weeks nothing wrong was noticed by the parents, but in a fortnight afterwards a white spot appeared on the front of the eye. The left eye was not affected at that time. There has been no trouble in the bad eye since, but during the last twelve months, when the boy has been at school, he has had some pain and watery discharge

* *An inquiry was made into this group of connected cases by a Medical Inspector of the Local Government Board; and an analysis of his report is given on page 41, where the case of M. W., one of the group, is numbered as Case CXVIII.*

from the left eye in doing his lessons. The boy was taken to Moorfields Hospital when ten months old; lotion and ointment were applied, but the mother was told there was little hope of restoring the right eye. She attended with the child six months, and subsequently attended St. Bartholomew's Hospital.

Condition of the child W. H. when seen by me on the 15th December 1890. The vaccination sites are situated on the left shoulder, two of them one-eighth of an inch in diameter, and one a quarter of an inch in diameter. They are not foveated, and are in fact very faint and ill defined. There are some small cicatrices in the following situations; one to the left of the breast bone, one in front of the right shoulder, one over the middle of the left shoulder blade, one on the outer side of the left shoulder blade, and one over the right hip. The teeth are good; there are no gland enlargements; the bones are good; the heart and lungs natural. The right eyeball is somewhat shrunken—the coats are unusally firm as if possibly undergoing secondary degeneration; the cornea is clear with the exception of one central nebula with which the iris is partially adherent; the pupil is blocked with lymph, and the iris bulges; the lens seems to be cataractous so far as it can be observed. There is no perception of light in this eyeball. The movements are good. The whole condition points to a central perforating ulcer in early life. The left eyeball is natural. The above report, so far as it relates to the eyeball, is confirmed by Mr. Marcus Gunn, surgeon to the Ophthalmic Hospital, Moorfields, who examined the child with me.

It is impossible, after such a long period has elapsed from the time of the vaccination, to give a satisfactory account of the case. If the mother's statement is correct, the eye affection began within three or four days after the vaccination punctures were made. The vaccination punctures appear to have given rise to very slight changes, and no mattery heads formed according to her statement. The third or fourth day appears too early for any inflammation of the eye to have been set up by contagion from vaccination punctures which were confessedly in this case mild in their reaction. The six pustules which subsequently appeared on the body were exceptional in causing cicatrices; nevertheless the course of the illness does not point to any septicæmia. It is just possible that the eye affection and the half-dozen small skin lesions on the body may have been manifestations of what is called a generalised vaccinia. If that were so, it would explain all these lesions having caused cicatrices; unlike impetigo which has been observed in many of the cases submitted to the Royal Commission, and which very seldom is followed by cicatrices, even though extensive. But, if this was a case of generalised vaccinia, it was exceedingly scanty in its distribution. It may be mentioned that occasionally both in chicken-pox and small-pox a pock appears on the cornea in the early stage, and, if the present case be regarded as one of ill-defined generalised vaccinia, it is just possible that the eye affection may have started in a similar way. But it is impossible to speak with any certainty as to the mode of production of this lesion.

Appended is a letter from Mr. J. H. Lynn, and also one from Mr. B. J. Vernon who is stated by Mr. Lynn to have seen the child W. H. at St. Bartholomew's Hospital.

THOMAS BARLOW, M.D.

(Copy of letter from Mr. J. H. Lynn.)

19, Vesta Road, Brockley,
London, S.E.,
6th November 1890.

DEAR SIR,

THE following case I am instructed to present for inspection on behalf of the Royal Commission.

W. H., of ——, is now eleven years of age. At eight months he was vaccinated by a private practitioner (Dr. B.), being at the time in good health. Almost immediately his right eye appeared to be affected, and in less than a week it was closed. Dr. B. treated it, and after poulticing &c. the eye was opened but the sight was gone. He was at once taken to Moorfields, where, according to the mother's statement it was admitted that vaccination caused or at least developed the injury. A few weeks ago at the same institution it was remarked that vaccination may have caused it. The child has also been taken to St. Bartholomew's where Dr. B. J. Vernon (the ophthalmic surgeon) saw it. The mother implies that he also thinks that vaccination may have caused this blindness, and that probably the operation was performed with impure lymph. He is otherwise now in good health. The parents are healthy and the six children. A seventh child, the first born, was vaccinated in infancy. Four operations were necessary (as the first three "did not take.") After the fourth operation, which was "successful," this child became ill and died from "blood poisoning" which was attributed to the vaccination. A married son, successfully vaccinated when a child, has twice had small-pox.

If inconvenient for the Commissioners' Inspector to go to ——, I can convey the mother and child to him at his convenience.

Yours, &c.
J. H. LYNN.

Bret Ince, Esq.

(Copy of letter from Mr. B. J. Vernon.)

14, Clarges Street, Piccadilly,
15th November 1890.

In the matter of the child W. H.

DEAR SIR,

I AM sorry that I can give you no information as to the child's case. I have no recollection of ever seeing any case of disease of the eye which I thought could be imputed to vaccination.

I am, &c.,
BOWATER VERNON, F.R.C.S.,
Ophthalmic Surgeon,
St. Bartholomew's Hospital.

Bret Ince, Esq.

CASE 32, REPORTED TO THE COMMISSION BY MR. J. H. LYNN.*

Case of H. J. E.: report to the Commission of Dr. Theodore Dyke Acland.

H. J. E., of ——, was vaccinated on the 7th October 1890 by Mr. H. T., M.R.C.S., of ————. The child died 22 days afterwards, the certificate of the cause of death signed by Mr. H. T. being "erysipelas following "vaccination."

Mr. H. T. is the Public Vaccinator for ——, and in the performance of his duties vaccinated six children on the 7th October, of whom H. J. E. was one. At this time the child looked healthy and well grown for its age (six weeks).

The course of vaccination.

On the eighth day after vaccination there were at the points of inoculation two healthy vesicles on the upper and outer part of each arm; no complaint was then made by the parents, neither was attention drawn by them to any abnormal appearance of the arms, and Mr. H. T. states that the arm appeared perfectly healthy.

Mr. H. T.'s report.

On the fourteenth day after vaccination he was called to see the child and found an erysipelatous blush round the vesicles on the left arm; the erysipelas was diffuse, and spread gradually over the whole body, it was not checked by any treatment, and on the eighth day of the illness the child died.

The mother's report.

The mother states that on the third day after vaccination there were small sores on both arms at the point of inoculation, but on the eighth day when she took him to Mr. H. T. she did not think there was anything wrong, and, although there was some redness about the vesicles, she did not anticipate any harm until after she returned from the inspection. She says it was a very bitter day, and on the next morning the arm round the vesicles was so inflamed that she applied cold-water dressings, but it was not until the fourteenth day that she called Mr. H. T.'s attention to the fact that

* *An inquiry was also made into this case by a Medical Inspector of the Local Government Board. The case is the same as that numbered as Case CXXXVI. on page 47.*

there was an inflammation spreading from the vaccination vesicles.

It is admitted by Mr. H. T., a competent and skilled observer, that in this case erysipelas originated in or round the vaccination wound, and that it was the cause of the child's death.

Line of inquiry. This inquiry has been directed to ascertain, if possible, the cause to which the erysipelas was due; and with this object the following points have been considered:—

a. The origin of the lymph.
b. The effect of the same lymph on other children.
c. The possibility of the child having been inoculated with the erysipelas when it was vaccinated.
d. Whether there was anything in the surroundings of the child which might have been the source of the infection, owing either to some sanitary defect in the cottage, want of cleanliness, or through the child being brought in contact with any infection round or near its home.

a. Origin of the lymph. In order to prepare for the October vaccinations Mr. H. T.'s partner (Dr. M.) obtained some calf lymph from the Local Government Board, and with it he vaccinated H., the infant son of Mrs. W. P., a lady residing at ——. This child was a selected healthy child, and his appearance now (March 1891) fully justifies the selection. He is a robust, well cared for, vigorous infant.

From the vesicles on this child's arm lymph was taken and used to vaccinate two children, both of whom did well. From one of these, W. C., who was considered to be a typically good subject, lymph was taken, with which Mr. H. T. vaccinated the six children, on the 7th October, of whom H. J. E. was one.

I have visited the child, W. C., he is a bright, healthy child. He is kept clean and tidy, and has all the appearance of being well cared for. There is nothing abnormal in the vaccination cicatrices.

The other children vaccinated at the same time and with the same lymph as H. J. E. were T. A. S., G. B., B. C., C. C. and H. J. W.

b. The effect of the same lymph on other children. Mr. H. T. reports that all these cases did well. The vaccination eruption ran a normal course, and recovery in each case was uninterrupted by any mishap.

I have since visited these children. Their present condition is as follows:—

B. C., youngest of six children, aged five months. After vaccination the mother says that there was some ulceration and the scars were not healed for five weeks, but she did not think it necessary to take the child to Mr. H. T. There are now two scars on each arm with deeply marked cicatrices, but the child is well and healthy. The cottage is poor and not clean.

C. C., first cousin of above, aged five months. Youngest of eight children, all vaccinated by Mr. H. T. The cicatrices are firm and well healed. There was no mishap of any kind after vaccination. The cottage is poor and dirty; and the child is not kept clean.

G. M. B. The vaccination was followed by a measly rash, which did not seem to affect the child's health. The cicatrices are healthy. The child looks well.

T. A. S. On the right arm two of the vaccination vesicles have coalesced, leaving one cicatrix. The mother says that the wounds were not well until Christmas, a period of 2½ months. They kept on scabbing over and discharging. The child seems well now. Both it and its surroundings are filthy.

H. J. W. Nothing abnormal to note as to course of vaccination or cicatrices. The child looks healthy. Its surroundings are very dirty.

From the last of this batch, H. J. W., lymph was taken, and a second batch have since been vaccinated with success and without any mishap of consequence; although one child of this batch suffered subsequently from lichen urticatus (a form of nettle rash), which was probably the result of the irritation caused by the vaccination, but it was a trivial matter, and the child's health is not in any way affected.

c. Possibility of inoculation at the time of vaccination. It may thus fairly be concluded that the lymph was not at fault since, with the calf lymph obtained from the Local Government Board, the child H. P. was well and safely vaccinated, and with lymph from his arm the child W. C. was vaccinated without any bad symptoms. And since five out of the six children vaccinated with lymph from W. C.'s arm received no hurt, it would appear that the poison was not conveyed by the lymph, unless through some accidental contamination at the time of vaccination. That this, however, was probably not the case is shown by Dr. Fehleisen's experiments (On erysipelas; Microparasites in disease: New Sydenham Society, 1886), who has shown (if his observations are conclusive) that the incubation period of erysipelas is not less than 15 or more than 61 hours from the moment of inoculation to the appearance of the first rigor (shivering),* which period coincides fairly well with the time of the appearance of the redness. He further adds that disturbance of the general health was hardly ever absent during the period of incubation. It is admitted that H. J. E. was well until after the eighth day, and that up to this time there was no appearance of redness about the wounds.

d. Possibility of infection through surroundings. Again, the virus of erysipelas might have been received from without, apart from obvious inoculation, the vaccination wound affording the channel by which it entered the body, for it is a well-known fact that wounds caused by surgical operations are specially liable to be infected; notably is this the case when the surroundings of the patient are insanitary. No such special danger seemed to exist in this case.

Mrs. E.'s home when visited on Sunday, the 1st February, was a type of what an English cottage should be, beautifully clean and with everything in good order. Mrs. E.'s personal appearance and that of her other child showed the same cleanliness and care which was so evident throughout the house. The child's whole surroundings were in marked contrast to those of the two children, T. A. S. and H. J. W., both of whom were vaccinated with the same lymph and did well. The sanitary condition of the house, though not by any means faultless, was free from gross defects. The scullery communicated directly with the living room and the sink in it was untrapped, but the pipe discharged into the open air over a gulley, round which there was nothing offensive. The privy did not communicate directly with the cottage, but opened into the garden, and was said to be connected with a cesspool in the garden. Mrs. E. had no complaint to make of any offensive smell in the house.

Dr. J., Medical Officer of Health to the —— Sanitary District, reports that "there are foul ditches "and cesspools in that part of ——, of which com- "plaints have been made in hot weather," and it may be noted that about a quarter of a mile in the rear of the cottage are some dirty uncared-for houses and much unnecessary filth; but the weather at the time the child was vaccinated was cold, and I have been unable to discover any gross defect which does not exist in a large proportion of all village communities, or which would have rendered the vaccination in this case particularly dangerous. Neither does the locality seem very unhealthy. Dr. J. informs me that no diphtheria has been reported in —— for some months previous to October 1890, though there were a good many cases in the latter part of 1889; and in December 1890 there were two cases in a cottage not far from —— Road. No erysipelas, however, is known to have existed in any other house in —— during the year 1890. E. E., the child's eldest sister, now in excellent health, was, Mr. H. T. tells me, suffering at the time of the vaccination from a sore throat, the nature of which is doubtful, and the child in the next cottage had whooping-cough; but there is no evidence to lead me to suspect that the death of the child H. J. E. was in any way connected with either of these complaints.

As far as I could ascertain there is no ground for supposing that in this case the erysipelas arose from defective sanitary arrangements. The following circumstance may have been an exciting cause. The day (the eighth after vaccination) on which the child was taken to Mr. H. T. for inspection was bitterly cold (so Mrs. E. tells me), and she did not return till after dark. It is well known that sudden changes of temperature are a predisposing cause of erysipelas, when the infant's tender age and the presence of an open wound would render it more than ordinarily susceptible to the contagion.

Conclusion. After consideration of all the circumstances of this case, I am of opinion that the evidence does not tend to show that the disease was attributable to the lymph used or to carelessness in the using of it. It is admitted

* *Although the limits of the incubation period of erysipelas as deduced from experimental research are those given above, clinical observation gives much wider limits. (See Deutsche Chirurgie, Lief. 5, "Erysipelas," Dr. H. Tillmanx, at pages 96 and 120; and compare Case 115 on page 289.)—T.D.A.*

that the child was well until the eighth day. On that day it was exposed to severe cold, and the erysipelas appeared on the next day. It seems, therefore, possible that the affection was due to some accidental contagion acting upon the child at a time and under conditions that rendered it more than usually susceptible.

THEODORE DYKE ACLAND, M.D.

CASE 33, REFERRED TO IN THE PUBLIC PRESS.

Case of G. M. An inquiry was made into this case by a Medical Inspector of the Local Government Board, and an analysis of his report is given on page 46, where the case is numbered as Case CXXXIII.

CASE 34, REPORTED TO THE COMMISSION BY MR. J. H. LYNN.

Case of A. M. Copy of a report received by the Commission from the medical man by whom A.M. had, it was stated, been vaccinated.

I declare that A. M. of —— was vaccinated on October 14th, 1890. On October 21st her arm was inspected, and when seen one of the pocks had been rubbed and lymph was oozing.

Mother was advised to take great care of the arm and see that the others were not allowed to become the same; also the sleeve to be taken out or tied up (well), but so as not to produce pressure on the arm above the marks. I may just mention that a woman who was present said she would not allow a child of hers to wear such a frock (stiff) and lace in the sleeve during the period of vaccination, and she corroborates my advice to the child's mother.

I did not hear or see anything of the child until about a week or so after the inspection, when to my surprise the mother appeared with the child, asking me to look at its arm. I, on doing so, found that it had been self-inoculated in three or four places to the best of my remembrance. A week after this the mother again appeared with the child saying its arm was not yet better. On examination I saw that two of them were drying up and the others had scabbed—which to the mother caused the arm to appear I have no doubt not very nice—but in addition there were two other small marks, about this size O, which were dry. Their position I wish particularly to draw your attention, viz., one on the tip of the left thumb and the other on the tip of the nose. That part of the pocks which was dry was of a blue-red colour.

Since this time I have neither heard nor seen the said A. M., until I received the inquiry. The eruption; never saw any at either time the child was brought to me and suppose it refers to the extra marks.

This child (A. M.) when seen at the time brought for vaccination would in my opinion, *i.e.*, from a medical stand-point, be classed not amongst the most robust, but one who would derive great benefit from cod-liver oil and extract of malt.

The child was vaccinated from a child six months old, the family of which I attend. The mother of this child has five other strong children, and the one six months old has never had any rash or other symptoms or one day's illness beyond a little cold and is getting on well. This child recovered well from vaccination, not in any way causing the mother any trouble; the scabs falling off at the usual period. Nothing appeared to suggest that child is not healthy.

One child was vaccinated with lymph from same source as A. M. and the mother had no trouble whatever, one scab falling off at the end of three weeks, the others were a little longer for they got slightly rubbed; and she found no difference during the vaccination period from her other children when vaccinated. This child has been perfectly well since the day of vaccination and no symptoms whatever has the mother noticed since that day—*i.e.* such as a rash, blisters, &c., or eruption of any kind. I saw this child this morning and found it playing about and all right when at the same time I got the above information.

December 14th, 1890. J. H. O.

CASE 35, REPORTED TO THE COMMISSION BY MR. J. H. LYNN.

Case of E. R. Copy of two letters received by the Commission from the medical man by whom E. R. had, it was stated, been vaccinated.

DEAR SIR, December 18th, 1890.

IN reply to your letter dated December 12th I may say I have made inquiries and find the statements* correct. I am sorry not to have replied to you sooner, but press of work must plead my excuse. I was not aware that any ill effects had followed vaccination in the case of E. R. till I received your letter. I may say that the result seems to me unaccountable. I am most particular in cases of vaccination and take the following precautions:—

1. I ask the parents whether they would like human or calf lymph. The choice is invariably the latter. This I always obtain fresh from Mr. E. D., of ——.
2. I hand over the envelope unopened to the parents, drawing their attention to the recent dates of the post-marks. Seldom does the date show that I have had the lymph more than 24 hours in my possession.
3. I hand the little box contained in the envelope to the mother, to show that it states the contents to be "pure calf lymph."
4. I use a vaccinator to prevent the possible after remark that I was too free with the lancet.
5. Finally, I tell the mother that after the precautions I have taken no blame can attach to me should any ill effects follow.

I am glad to say all these precautions were taken by me in the case of E. R. The parents do not blame me (how can they?), and did not send in for any other medical man, but did what they thought best to make the child better. They did not complain, but were waited on by an anti-vaccination agent; hence the report which has reached you.

I remain, &c.,
H. B. B., M.B.

DEAR SIR, January 9th, 1891.

I AM sorry that I have omitted to reply to your letter before now. I have been very busy for the past few weeks and your letter got laid aside and has been forgotten. Please accept my apologies.

With reference to the child E. R. I can only say that I have not seen her since the day I filled up her certificate of vaccination. I made inquiries about her through an aunt, on the day I received your first letter, and was told that the child was "quite well," and that the mother did not wish any stir to be made in the matter.

Since the anti-vaccinationists have drawn your attention to the case, I hardly think it fair to myself (to whom no blame can attach) to be expected to make a long visit into ——, and furnish a report of the case. I can do so, but should expect them to remunerate my services. Till then I can only let you have hearsay evidence, and that a month old.

I remain, &c.,
B. Ince, Esq. H. B. B., M.B.

CASE 36 [SERIES], REPORTED TO THE COMMISSION BY MR. W. L. BEURLE.†

Case of G. M. and others. Copy of a letter received by the Commission from the medical man by whom the children in question had, it was stated, been vaccinated †

1, Clapton Square, London, N.E.,
DEAR SIR, December 15, 1890.

I HAVE made slight alterations to the extract from the evidence given before the Commission, and

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* *The statements referred to were as follows: "E. R. of —— was vaccinated 'about' the 12th October by Dr. B. of —— from 'calf-lymph from London' at the age of ten weeks. Nine days afterwards the condition of the arm was very serious. The area of the vaccination became 'one sore,' and eruptions appeared on the body—the chest, back and legs. These conditions continued about seven weeks and the child is now" (4th December 1890) "recovering."*

† *See minutes of evidence of Mr. W. L. Beurle appended to the Commission's Fourth Report, Questions 12,443-6.*

The Commission also examined another witness, Mr. Roland Dunn Smith, the writer of the letter, a copy of which is given above, as to this case. See minutes of his evidence appended to the Commission's Sixth Report, Questions 22,546-643.

you may now accept the report as substantially correct.

All *four* cases have thoroughly recovered, and I have no reason to fear any injurious after effects.

Previous to this I have never had any abnormal results when using calf lymph, and I have used calf lymph only for the last six or seven years.

I am, &c.,

Bret Ince, Esq. ROLAND SMITH.

Enclosure.

[*Extract from the minutes of the evidence of Mr. W. L. Beurle.*]

A medical man, a friend of mine, told me recently that he had under his treatment four cases of erysipelas, in each of which he believed the disease was communicated by vaccination; in these cases he had himself vaccinated the children with calf lymph. . . . . A case of erysipelas due to vaccination with calf lymph nearly proving fatal, reported to me by Mr. Roland Smith, M.R.C.S., was that of Grace Maffia, of 26, Quested Buildings, Brett Road, Hackney, who was born on the 4th August 1890, and was vaccinated in three places on Wednesday, 22nd October 1890, with calf lymph. She was examined on the 29th; the vesicles were then normal; and the case apparently ran a normal course as late as the 12th November. On the 15th Mr. Roland Smith was called to see the baby. From this day he saw the child every day, sometimes twice a day, until he considered it convalescent, on the 28th. On the 15th erysipelas began with redness, swelling, marked induration round the wounds, which were rather deep and sloughy. The temperature first was 103; varied during the week from 103 to 105; the redness and swelling extended down the right (vaccinated) arm to the hand and fingers. That began to get better. The erysipelas travelled across the chest in a band about four inches wide to the opposite arm, hand, and fingers. The whole lasted twelve days during seven of which the child was in great danger; that is, from the 17th to the 25th. Four other cases vaccinated from the same supply of calf lymph all ran a somewhat irregular course, with more or less erysipelatous inflammation. One of them had an abscess in the arm in the axillary gland from which—I do not remember exactly, but I think the doctor said, either a pint or half a pint—say, half a pint of blood and matter was discharged.

(*Professor Michael Foster.*) Do you know the source of that calf lymph in the case you are quoting?—Renner's.

[*Extract as altered by Mr. Roland Smith.*]

A medical man, a friend of mine, told me recently that he had under his treatment four cases of erysipelas, in each of which he believed the disease was communicated by vaccination; in these cases he had himself vaccinated the children with calf lymph. . . . . A case of erysipelas due to vaccination with calf lymph nearly proving fatal, reported to me by Mr. Roland Smith, M.R.C.S., was that of Grace Maffia, of 26, Quested Buildings, Brett Road, Hackney, who was born on the 4th August 1890, and was vaccinated in three places on Wednesday, 22nd October 1890, with calf lymph. She was examined on the 29th; the vesicles were then normal; and the case apparently ran a normal course as late as the 12th November. On the 15th Mr. Roland Smith was called to see the baby. From this day he saw the child every day, sometimes twice a day, until he considered it convalescent, on the 28th. On the 15th erysipelas began with redness, swelling, marked induration round the wounds, which were rather deep and sloughy. The temperature first was 103; varied during the week from 103 to 105; the redness and swelling extended down the right (vaccinated) arm to the hand and fingers. That began to get better. The erysipelas travelled across the chest in a band about four inches wide to the opposite arm, hand, and fingers. The whole lasted twelve days during seven of which the child was in great danger; that is, from the 17th to the 25th. *Three* other cases vaccinated from the same supply of calf lymph all ran a somewhat irregular course, with more or less erysipelatous inflammation. One of them had an abscess in the *axilla, about the size of a hen's egg.*

(*Professor Michael Foster.*) Do you know the source of that calf lymph in the case you are quoting?—Renner's.

CASE 37, REPORTED TO THE COMMISSION BY Mr. W. L. BEURLE.*

Case of———. Copy of a letter received by the Commission from the medical man by whom the child in question had, it was stated, been vaccinated.

Hoe Street, Walthamstow,

DEAR SIR, December 18th, 1890.

WHEN in practice at Stamford Hill, 1883—as near as I can remember, a child was vaccinated by me from another child's arm. The vaccinifer developed measles on the third day after the vaccine had been taken from it and on the eighth day the child vaccinated from it showed the usual vaccination pustules and the next day measles appeared. No harm befell either child, each disease ran its due course. From the long time that has elapsed I am unable to give further particulars, but I was much impressed with the occurrence at the time and am positive as to the facts as far as I have related them.

I am, &c.

Bret Ince, Esq., M. CULPIN.
Secretary,
Royal Commission on Vaccination.

CASE 38, REPORTED TO THE COMMISSION BY MR. J. H. LYNN.

Case of W. H. F. An inquiry was made into this case by a Medical Inspector of the Local Government Board. The following is an abstract of his report.

Registrar-General's register contains entry of death, on the 3rd February 1891, of W. H. F., aged three months, certified by Mr. C. as from "Vaccination; erysipelas; asthenia." (This case was not brought to the notice of the Board till August 1892.) Dr. Copeman was directed to make inquiry and reports to the following effect:—

Mr. C., the signer of the death certificate, stated that he attended Mrs. F., the mother of deceased, in her confinement (October 13th, 1890), and that the child (W. H. F.) was a full-grown and apparently healthy one. After the usual period of attendance, he was not, he said, sent for again until January 10th, 1891, when he was called to Mrs. F., who was suffering from an abscess of the neck. He did not see the child on this occasion. On January 26th, however, he was asked to see him and found redness and swelling of the left arm extending also down the left side of the body. The "heads" of the vaccination pocks he said had "come off," leaving deep ulcers of about the size of a shilling which were almost merging into one another. "Later," the blush extended gradually all over the body, dying away at one part as it spread elsewhere. Blebs also formed on different parts of the body and "sloughs "resulted when they broke." The child wasted towards the end and took no food, but it did not suffer, he said, from pneumonia convulsions, or diarrhœa. The treatment consisted of iron internally with lead and opium lotion to the skin and zinc ointment to the sores. Mr. C. stated that the child was dressed, when he saw it, in a long white nightdress. He had, he said, learnt that the child had been vaccinated by Dr. R., the Public Vaccinator, but Mr. C. had not asked him to see the child during the course of his illness.

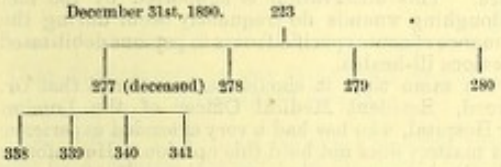
Mrs. F., who had left the house in which deceased had died, stated that W. H. F. was born on October 13th, 1890, and that with the exception of a slight attack of bronchitis, when about a fortnight old, he had been perfectly well up to the time of vaccination. She said also that she had suckled him up to the time of his being taken ill. The child was vaccinated on January 7th, 1891, by Dr. R., Public Vaccinator, at No. 3 Station, and was taken for inspection on that day week (January 14th, 1891) by Mrs. F. herself, she stated. This however Dr. Copeman subsequently found was not the case,

* *See minutes of evidence of Mr. W. L. Beurle appended to the Commission's Fourth Report, Questions 12,443 and 12,487-95.*

she having remained at home on account of an abscess in the neck, while the child was sent to the station in charge of a friend. The child, she said, progressed quite favourably for ten days afterwards, but late on the night of January 23rd, she noticed that he was breathing "hard" and had a wild look in his eyes. He was also moaning as if in pain, but there was nothing unusual about the arm. On the following day, January 24th, she noticed a lump in the armpit but there was not then any marked redness of the arm. On January 25th, however, the arm had become very red and swollen, so she called in Mr. C. As soon, she said, as the child was vaccinated, she cut out the sleeve of his dress, and hung a handkerchief over the arm, but she was sure this had never stuck to the arm. She further said that she had bathed the arm with warm water only, and had used no other local applications until Mr. C. was called in. She could not remember when the "heads" came off, and could give no reliable information as to the course of the illness. Her other child, she said, had been perfectly healthy, and she did not know of any infectious illness in the neighbourhood at that time. Asked as to the abscess in her neck, she said that Mr. C. had told her to poultice it for about a week, after which it was lanced. It subsequently discharged for a few days during which time she dressed it herself. Dr. Copeman afterwards learnt from Dr. R., the Public Vaccinator, whose attention had been drawn to the case, that inquiry at the time of the occurrence had elicted the fact that the abscess was lanced about two days before the child was taken ill, and that Mrs. F. had during this period repeatedly bathed her neck and also the child's arm.

Dr. R., the Public Vaccinator, is not engaged in private practice. From Dr. R.'s books Dr. Copeman learnt that the child F. had been vaccinated at No. 3 Station on January 7th, 1891. He was brought, as Dr. R. stated, for inspection on January 14th by a woman who said that the mother was unable to come on account of a bad neck.

The following table showing lymph descent is copied from Dr. R.'s register :—



With the help of the Vaccination Officer, Dr. Copeman attempted to hunt up these children, but with only partial success, as in many cases the family had removed without leaving any address. 223, from whom the child F. was vaccinated, could not be found, neither could F.'s three co-vaccinees, Nos. 278, 279 and 280. But the vaccination of all four of these children was found to be, Dr. R. stated, perfectly normal on the eighth day.

Of those vaccinated from F., on January 14th, Dr. Copeman traced three, viz., Nos. 338, 339 and 341. These were all fine healthy looking children with four well-marked vaccination scars on the arm of each, and in each instance, he was informed by the mother, the vaccination had pursued a perfectly usual course, there having been no unfavourable symptom of any kind.

Case 39, reported to the Commission by Mr. J. H. Lynn.

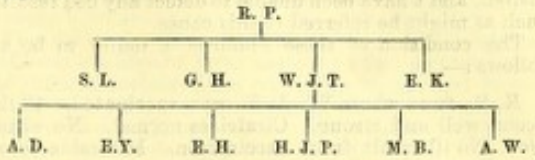
Case of H. J. P.: report to the Commission of Dr. Theodore Dyke Acland.

H. J. P., aged 12 months, was vaccinated on the 4th February 1891, by Dr. J. W., Public Vaccinator, of ———. He died on the 26th February 1891, of "septic "pneumonia following cellulitis of the arm, consequent "on sloughing of and round the points of inoculation."

The lymph used for the vaccination of H. J. P. was obtained from the arm of W. J. T., aged 4 months, of ———, who was one of four children vaccinated with lymph obtained from the arm of R. P.

Besides H. J. P., five children were vaccinated with lymph taken from the arm of W. J. T.

The following diagram shows the source of the lymph :—



All these children resided in the district for which Dr. J. W. was Public Vaccinator and were all vaccinated by him.

The vaccinations were performed at the public vaccination station, which I visited and found that everything was done by Dr. J. W. to ensure successful results. His general method is to vaccinate from arm to arm, the lymph being taken in capillary tubes, never with the point of the lancet. These details are mentioned because Mrs. P., the mother of H. J. P., in conversation with me expressed doubts as to the true source of the lymph, and stated that it was not taken from the arm of the child W. J. T. The enclosed letter bears upon this statement and is, therefore, appended :—

Re H. J. P.

Dr. Acland.

Dear Sir, March 19, 1891.

Dr. J. W. requests me to write you respecting the statement made to you by Mrs. P.

I called in company with Dr. J. W. and saw Mrs. P. the Saturday after the decease of her child. She stated in my presence that the baby her child was vaccinated from was small but healthy, and also said that its mother looked clean.

Dr. J. W. desires me to inform you that he invariably removes the lymph by means of capillary tubes and then blows the contents on to the lancet. Mrs. P.'s statement as to the tube being used is therefore correct.

Yours faithfully,

W. A.

It should also be noted that Mrs. P. had her child vaccinated at the public station by Dr. J. W., in consequence of his successful vaccination of children living in the same house as herself.

No complaint seems to have been made either of the child from which the lymph was taken, or of the manner in which the vaccination had been performed, until after the wound sloughed. On the 8th day after vaccination the child was taken to Dr. J. W., and neither he nor Mrs. P. at that date anticipated any bad result.

The child's arm began to inflame on the 12th day, but it was not then taken to Dr. J. W. (who did not see him again until after his death), but was under the care of Mr. P. until the fatal issue on the 26th February. The methods of treatment adopted did not check the spread of the sloughing, which continued for about 10 days. The exact details of treatment are purposely omitted as they have no direct bearing on the course of the malady.

Dr. J. W. reports that when he saw the child on the 11th February, the 8th day after vaccination, all the places in which he had been vaccinated looked healthy and the mother made no complaint.

After death all four vesicles had run into one large sloughing wound. Both Dr. J. W. and Mr. P. agree that the primary cause of death was sloughing of the arm extending from the vaccination wounds. This, according to Mr. P.'s statement, was followed by septic pneumonia, or, as he has put it in the certificate of the cause of death, pyæmia (the two statements being compatible).

Three factors may have contributed to the child's death :—

1. Some accidental contamination of the lymph.
2. The accidental inoculation of an otherwise healthy vaccination wound by some septic virus, resulting from insanitary surroundings, want of cleanliness, or exposure to some specific contagion.
3. An abnormal suspectibility on the part of the child increased by previous ill-health or enfeebled constitution.

(1.) *The lymph.*

Any evil effect due to impurity or accidental contamination of the lymph should have declared itself by the results of vaccination on some of the other children inoculated with it.

The homes, however, of all the children have been visited, and I have been unable to detect any bad results such as might be referred to this cause.

The condition of these children I found to be as follows :—

Vaccinifer of vaccinifer. R. P., from whom W. J. T. was vaccinated. Child seems well and strong. Cicatrices normal. No eruption. No ill-result from vaccination. Miserable home in a dirty court. Surroundings filthy.

Vaccinifer. W. J. T., from whom H. J. P. was vaccinated. Quite well. Has in no way suffered from vaccination. Cicatrices normal. Is clean and tidily kept.

Co-vaccinees of W. J. T., the vaccinifer of H. J. P. S. L., not seen, as she was out with her mother. Reported to be perfectly well by two women living in same house.

G. H., cicatrices normal. No eruption. No sloughing round vaccination scars. Surroundings dirty. Child ill-kept.

E. K., parents have left the house. Whereabouts not known. Quite well when last seen.

Co-vaccinees of H. J. P. E. Y., vaccination wounds not yet healed : they are still covered with pulpy granulations, but this is accounted for by the fact that the child is dirty and ill-kept, that the scabs have been rubbed off, and that the wound is constantly being irritated by the dirty edge of the sleeve, which is covered with old secretion from the wound. The whole condition is admirably adapted for producing septic poisoning from the wound.

A. E. W., a dirty, ill-kept child. The scabs on the vaccination wounds have been rubbed off by the dirty edge of the sleeve, and one or two small places round the scar had been re-inoculated, producing pustules about the size of a small split pea ; there was no general eruption, and otherwise the child seemed well.

M. B., a miserable, half-starved child with a poor feeble mother. The wounds are cicatrizing, but the scabs have been rubbed by the edge of the sleeve and the process of healing has in consequence been delayed.

E. H., a dirty, ill-kept child. Suffered after vaccination from a papular rash, which is now well. Vaccination cicatrices normal.

A. F. D. There is no house in the road in which this child was said to live such as was given as her address. A Mrs. D., who lived at a house in that road with a number somewhat similar to that given, has gone away and has left no address.

From these facts it will be seen that of the first generation, i.e., S. L., G. H., W. J. T. and E. K., all are known to be well, except E. K., who cannot be found, but who when last seen was reported "quite "well." And of the second generation all have been successfully vaccinated notwithstanding conditions which might easily have given rise to serious complications.

In fact, of all the children visited, W. J. T., from whom the lymph was taken, was the only one found to be clean and tidily kept. There was a great want of personal cleanliness in all the others, their surroundings were most disadvantageous and well calculated to result in accidental septic infection. It is indeed matter for surprise that no more serious consequences have resulted than delay in the cicatrization of some of the wounds.

It might, however, be objected that the fact of sloughing occurring after vaccination in one child only out of six inoculated with the same lymph does not of necessity free the lymph from suspicion. It might be argued either that the one child was more susceptible than the rest, or that it received a larger dose of the lymph.

This argument can only be met on general grounds, but experiment has fairly shown that ordinarily septic infection of a wound, or even of unbroken skin by decomposing animal fluids, declares itself by redness, swelling, and pain after an interval of a few hours only.

Thus Dr. Garré produced severe inflammation by rubbing a pure cultivation of staphylococcus pyogenes aureus (the organism which is most commonly found in traumatic infective disease), into his own arm. The first symptoms were noted six hours after inoculation, and by the fourth day the inflammation was intense, on the sixth day at its height. It may, therefore, reasonably be inferred, both from experiment and clinical experience, that the lymph was not the source of danger, the inflammation in this case not making its appearance until the 12th day.

(2.) The vaccinee wound.

At or about the time of vaccination the child was exposed to infection from scarlet fever. The landlady of the house, Mrs. M., began to sicken with it on the 26th December, and her three children followed on the 2nd, 3rd, and 4th January. It would seem that Mrs. M. took great pains to carry out proper disinfection and to prevent the spread of the disease, but in a house where there are several families, a common staircase, &c., the difficulties of complete isolation and disinfection must be very great if not insuperable, and although Mrs. P., the mother of H. J. P., did not assist Mrs. M. in nursing her sick children, she did fetch medicine for them, sometimes in company with Mrs. M., so that there were frequent opportunities for the conveyance of the infection to her own children. No one else in the house is known to have had scarlet fever, but about a week after H. J. P. was vaccinated one of Mrs. P.'s other children, E., was unwell, and Mrs. M., with her recent experience, suspected it might be scarlet fever. Mr. P., who knows the circumstances, thinks that this is not the case, and no evidence of the child H. J. P. having had scarlet fever could be obtained. It is, however, even in adults often a matter of great difficulty to say whether a person who is known to have been exposed to the contagion of scarlet fever has suffered from it or no, and the point is frequently only decided by the subsequent history of the case.

In this instance all that can be said is that the child was exposed to the infection ; that the medical certificates given by Mr. P. to postpone vaccination show that at the time that the child was so exposed it was not in a robust state of health, and that this circumstance combined with the child's tender age would be liable to render it more than usually susceptible to infection.

It has been stated by Mr. Cooper, of Morcham (Cross on the Variolous Epidemic at Norwich in 1819, page 290), that in vaccinated infants suffering from scarlet fever there is a special tendency to inflammation round the vesicles. This observation is supported by the fact that sloughing wounds do frequently occur during the continuance of acute specific fevers in persons debilitated by previous ill-health.

At the same time it should be mentioned that Dr. Hopwood, Resident Medical Officer of the London Fever Hospital, who has had a very extended experience in this matter, does not hold this opinion. He informs me that he has never seen any evil result occasioned by vaccination before or after or even during scarlet fever.

It must further be added that the condition of Mrs. P.'s rooms left much to be desired in the way of personal cleanliness, and the sanitary condition of the house was defective ; for, although neither the sink nor the closet communicated with Mrs. P.'s room, the closet, which was fitted with the old-fashioned pan, was very offensive, and the sink opened directly on to the staircase without ventilation. There was a manhole communicating with the sewer immediately outside the front door. Mrs. M., the landlady, however, said she had no complaint to make.

(3.) The child.

Sloughing of the tissues round a wound and subsequent septic infection may result from abnormal susceptibility on the part of the person wounded, to the particular virus which is inoculated through the wound; or, apart from the nature of the inoculated virus sloughing, may be due to the local condition of the tissues, resulting from a general enfeeblement of the constitution following on previous ill-health.

As bearing on these points it should be noted that when the child H. J. P. was vaccinated it was 12 months old, and that vaccination had been twice postponed for the utmost limit allowed by law (two months).

The first certificate of postponement of vaccination was given by Mr. P. on the 17th June 1860, the reason given by him being that the child had a nævus under treatment.

The second certificate given by the same gentleman, signed on the 21st November 1890, stated that the child had bronchitis.

The nævus mentioned was a small one on the buttock, and Mr. P. cannot say with certainty whether or not he vaccinated the child on it as is often done, but from the fact that he gave a certificate of exemption from vaccination it can hardly be supposed that he did. These certificates shew that in Mr. P.'s estimation the health of the child within two

months of its being vaccinated was not perfect, as it is stated to have been at the time the vaccination was performed.

Taking the above facts into consideration, it seems probable that the abnormal results of vaccinationwere due to a combination of circumstances—the personal and domestic conditions under which the child lived, its exposure to and possible infection by the scarlet fever contagion, and the previously enfeebled state of its health; and that these acting upon it and rendering it more than usually susceptible during the second stage of vaccination, when the constitutional symptoms are most severe, sufficiently account for the fatal issue.

THEODORE DYKE ACLAND, M.D.

CASE 40, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of E. D. An inquiry was made into this case by a Medical Inspector of the Local Government Board; and an analysis of his report is given on page 57, where the case is numbered as Case CLXV.

CASE 41, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of E. P. An inquiry was made into this case by a Medical Inspector of the Local Government Board; and an analysis of his report is given on page 55, where the case is numbered as Case CLVIII.

CASE 42, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of M. I. W. An inquiry was made into this case by a Medical Inspector of the Local Government Board; and an analysis of his report is given on page 58, where the case is numbered as Case CLXVII.

CASE 43, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of E. K. An inquiry was made into this case by a Medical Inspector of the Local Government Board; and an analysis of his report is given on page 59, where the case is numbered as Case CLXVIII.

CASE 44, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of H. B. An inquiry was made into this case by a Medical Inspector of the Local Government Board; and an analysis of his report is given on page 67, where the case is numbered as Case CLXXXIX.

CASE 45, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of G. M. H.: report to the Commission of Dr. Theodore Dyke Acland.

G. M. H., of ———, was vaccinated by Mr. A. E. T., M.B., F.R.C.S., on the 10th March 1891; she died on the 19th March of the same year. The death was certified by Dr. A. E. T., as from "convulsions; gastric "catarrh following on vaccination (9th day after)."

The child for three months previous to Christmas had been a source of great anxiety to her mother; she had suffered severely from whooping cough and bronchitis, and had not infrequently suffered from convulsions; and although when vaccinated she appeared well, she had never really been strong.

Mother's account.

Vaccination was performed on Tuesday, the 10th March, and in the evening of the same day the child became restless and irritable. Mrs. H. was inclined to attribute this to the fact that the child's teeth were beginning to trouble her. She says that the vaccination punctures always looked healthy.

This fact is of importance, for had the lymph been at fault, constitutional disturbances might have resulted from some local irritation or septic infection, but there is no evidence to show that the points of inoculation presented an abnormal appearance at any time.

There were no other marked symptoms until the fourth (Dr. A. E. T.) or sixth day (Mrs. H.), when for the first time the child vomited. Sickness recurred at intervals during the next three days, and on the ninth day the child died in a convulsion.

Conclusions.

The child's previous ill-health, her irritability from teething, and the fact that she had on several previous occasions suffered from convulsions, make it probable that any irritant, however slight, or in itself harmless, would be sufficient to produce a violent effect. And it is possible that the constitutional disturbance usual after the eighth day of vaccination was sufficient to upset the balance and produce the serious results from which the child died. It should at the same time be pointed out that before vaccination the child exhibited symptoms similar to those from which she suffered afterwards, that the vaccination wound never presented any abnormal appearance, and that the constitutional irritation commenced within a very few hours of vaccination without any appearance of local disturbance.

Taking all these facts together, it may reasonably be doubted whether the vaccination bore more than an accidental relation to the child's death; which seems rather to have been due to one of those derangements of the digestive system so frequent and fatal in infants and especially in those who have been debilitated by previous illness.

Dr. A. E. T., who signed the certificate of death, writes:—

"... I had considerable doubt that the death "of the child was due to vaccination, and on referring "to the fly-leaf of my certificate I find that I have put "a query ... The vesicles ran a perfectly "normal course."

The lymph.

The lymph used in this case was calf lymph obtained through Mr. S., chemist, &c., of ———. It was supplied by Dr. R. on the 25th February 1891, and is numbered in his books ———, the invoice number being ———. Dr. R. has with great readiness placed all the information he possesses about the effects of this batch of lymph at my disposal, and has offered to send out a printed inquiry form such as was used on a previous occasion, but, taking the circumstances of the case into consideration, this seems to be unnecessary.

THEODORE DYKE ACLAND, M.D.

CASE 46, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of S. J. L. An inquiry was made into this case by a Medical Inspector of the Local Government Board; and an analysis of his report is given on page 65, where the case is numbered as Case CLXXXII.

CASE 47, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of L. B. An inquiry was made into this case by a Medical Inspector of the Local Government Board; and an analysis of his report is given on page 58, where the case is numbered as Case CLXVI.

CASE 48, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of E. W. An inquiry was made into this case by a Medical Inspector of the Local Government Board; and an analysis of his report is given on page 59, where the case is numbered as Case CLXIX.

CASE 49, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of D. C. An inquiry was made into this case by a Medical Inspector of the Local Government Board; and an analysis of his report is given on page 63, where the case is numbered as Case CLXXIX.

CASE 50, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of H. F. H. An inquiry was made into this case by a Medical Inspector of the Local Government Board; and an analysis of his report is given on page 62, where the case is numbered as Case CLXXVI.

CASE 51, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of E. A. D. An inquiry was made into this case by a Medical Inspector of the Local Government Board; and an analysis of his report is given on page 61, where the case is numbered as Case CLXXIV.

CASE 52, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of G. M.: report to the Commission of Dr. Theodore Dyke Acland.

G. M., aged 19 months, was vaccinated by Mr. F. R., of ———, on the 23rd April 1891. She died on the 11th May. The certificate of the cause of death was signed by Mr. J. W. W., M.B., of ———, as "general tuber-"culosis; indefinite vaccination 22 days."

Source of lymph. The lymph with which this child was vaccinated was procured from Mr. C. T. T., of ———, (Public Vaccinator for the fourth district of the —— Union), who took it from the arm of the youngest child of Mrs. B., of ———. Mr. C.T. T. has known both Mrs. B. and her husband for many years, and he is confident that there is nothing in the history of either of them which would warrant any suspicion of hereditary disease in the child. *Vaccinifer.* I visited Mrs. B. and the child and found them both in excellent health. The child was full grown, vigorous, and bright; its vaccination had been unattended with any abnormal symptoms, and there was no evidence of any undue inflammation of, or round, the vesicles.

Method of collecting lymph. The lymph was taken from the child's arm on the 11th February, and was stored in tubes. Mr. C. T. T. states that he is exceedingly careful about the manner in which he collects the lymph, and as to the cleanliness of his instrument, he soaks his lancet for many hours in solution of perchloride of mercury, washing and wiping it before using. *Antiseptic precautions.* All the lymph taken from the child was sent to Mr. F. R.

Six children were vaccinated with the same lymph; five on the 19th March 1891, and the one, G. M., on the 23rd April. The results of the five vaccinations done on the 19th March were, without exception, good. They are as follows:—

Co-vaccinees. W. B. A fine large healthy child; no abnormal results; cicatrices healthy.

F. B. A delicate, puny child. Health has much improved since vaccination. There is only one scar which is normal.

C. W. Three scars, all healthy, a shield was used in this case; this caused much local irritation, which subsided entirely when the cause was removed.

The above-named children were inspected by me on Sunday, the 21st June; the accounts as given by the parents of the two others were so satisfactory that I did not consider it necessary to visit them as they lived in opposite directions some miles from ———. The reports given were as follows:—

H. C. "The child has never ailed anything since he "was vaccinated, he has never had any rash."

H. D. "Is in a very healthy state, and did not suffer in "the least from vaccination."

G. M. was vaccinated at her parents' house on the 23rd April. A previously unopened tube of lymph was used for the purpose.

Mr. F. R. states that he had himself put off the vaccination of this child on more than one occasion on account of the miserable state of her health. He says that she was a puny, rickety infant, and that he vaccinated her eventually at the request of her mother who said that the child "could not be worse, and that vaccination might improve "her health." (It being, as I am told, in that part of the country a tradition that vaccination may improve the health of a delicate child.)

The parents had been a good deal troubled by frequent communications from the Vaccination Officer requiring the child to be vaccinated. They had refused to have either of their other children vaccinated "on principle," and the father had been summoned, though the summons was eventually withdrawn on production of a certificate from Mr. F. R. that the child was unfit for the operation.

Mrs. M., the mother of G. M., informed me that her child had been in very feeble health since she was three or four months old. Although it was 19 months old she could not stand, neither could she talk at all. Since Christmas she had been cutting its teeth, and although dentition was almost complete, she had suffered much and had rapidly lost ground. The mother further stated that the child had measles 14 days before vaccination was performed, and that at the time there was a certain amount of desquamation going on. These facts bear out her own statement to Mr. F. R. quoted above, that the child could not be worse, and might be benefited, by vaccination.

The vaccination apparently aborted. For 14 days there was nothing to be seen, according to the mother, at the site of inoculation, except the scratches caused by the lancet; but she informed me that, on the day following the vaccination, "there was a breaking out" above the ear on the same side as the vaccination. This, however, from her account, appears to have been nothing more than eczema. On the 12th day, according to Dr. J.W.W., the temperature reached 104°, and on the 14th day the points of inoculation became inflamed, and there was an areola about the size of half a crown. This was followed by a vesicular and pustular eruption, which is said to have been limited to the right side of the body. On the 19th day, Dr. J. W. W. informs me that there were some pustules visible on the right side of the pharynx, and that the tonsil on that side became covered with muco-purulent exudation. The child never rallied, swallowing became difficult, emaciation increased, and death took place on the 22nd day.

Conclusions. Death would seem to have resulted in this case from exhaustion, the result of long continued ill-health. It was doubtless accelerated by the constitutional disturbance caused by dentition, and still further by the attack of measles from which the child suffered previous to vaccination, and possibly by the results of vaccination on a constitution already much enfeebled. But owing to the fact that the vaccination appears to have aborted and to the many morbid influences at work, it is difficult to estimate with any certainty the independent effect of the vaccination.

It appears probable, both from the mother's account and from Mr. F. R.'s statement that in any case the child would not have long survived, and that in accordance with the prevailing belief vaccination was resorted to only as a desperate measure, other means having failed. And although the wisdom of vaccinating a child in such a con-

dition must be questioned, death cannot, in this case, I believe, be attributed solely or mainly to the operation.

THEODORE DYKE ACLAND, M.D.

CASE 53, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of N. B. M. S. An inquiry was made into this case by a Medical Inspector of the Local Government Board; and an analysis of his report is given on page 64, where the case is numbered as Case CLXXXI.

CASE 54, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of G. B. S.: report to the Commission of Dr. Theodore Dyke Acland.

G. B. S. was vaccinated on the 23rd April at ——, by Dr. R. C. He died on the 13th May 1891, of erysipelas. The certificate of death was signed by Mr. R. S. H., of ———, as "febricula, 10 days; convulsions and exhaus-" tion, one hour."

Dr. R. C.'s report to the Local Government Board states as follows:—

" —— Union.

"G. B. S., born on the 24th December 1890, at " ——; was vaccinated on the 23rd April (Thursday), " from two points of stored calf lymph, No. ———, " together with three medical students of St. Bartholo-" mew's Hospital. There was no suitable case, from " which the child could be vaccinated, which came back " for inspection on the 23rd April. On the following day " week the child and the three medical students, viz.:—

"A. S. B.
"G. A. T. F., aged 24 years,
"W. E. M., aged 22 years,

" were inspected. The child had a very inflamed arm; " the inflammation surrounded the vesicles and extended " to the hand. The child was not obviously very ill, but " as the blush looked erysipelatous I ordered the child a " mixture of tinct. digitalis, m. 1; tinct. ferri perchlor. " m. iii; aqua ad 3ii., to be taken three times a day, with a " topical application of an acetate of lead lotion. I told " the mother she could get the medicine at any chemist's, " or free of cost at St. Thomas's Hospital. I also told " her to bring the child to me at the Hospital on Satur-" days; and the first time she came there was on May 2nd, " when I again saw the child. It was then suffering " from unmistakeable erysipelas; the vesicles were all " broken, the arm was œdematous, and the blush extended " over the shoulder of the vaccinated arm to the back and " chest. The child was pallid, but the bowels were said " to be not confined. I again saw the child on the 9th, " the treatment was continued, the child being no better " and patches of redness over its body and legs.

"The lymph at ——— ———. There were 22 children " vaccinated with the lymph No. ——. All done in five " places and all insertions successful on the 23rd April. " The vesicles were all normal in appearance on inspec-" tion. There were also 80 points sent up to the Local " Government Board.

"R. C."

Note.—With regard to the above report it should be observed that all the cases vaccinated at ——— (22 in number) were vaccinated direct from the calf. While in the four cases vaccinated at ———, lymph from the same calf, but stored on ivory points, was used.

Mrs. S., the mother of G. B. S., states that the child was never very strong; that at the time the vaccination was performed he had a cold; *i.e.*, running from the nose, but that he never had had any rash on the body; and that she had never noticed anything seriously wrong.

Vaccination was performed at ——— ———, at 2 p.m., on Thursday, the 23rd April. The mother took a handkerchief with her to rub off the lymph from one of the points of inoculation; because she hoped to reduce the number of vesicles to four instead of five, the number of inoculations always made in Dr. R. C.'s vaccinations. She states that she did this with a handkerchief which she had not only washed on purpose, but after it was clean she had rinsed it in cold fresh water to free it from any traces of soda; so that she is certain in her own mind that there could have been no contamination of the wound by it. The child was more restless from the time of the vaccination, but nothing locally was noticed until 9 a.m. on Sunday morning, 67 hours after inoculation.

This was the time at which the parents got up, so that it is possible that the redness then surrounding the points of inoculation had appeared some hours before it was noticed. The child had then no convulsions, vomiting, or diarrhœa, and was not taken to any doctor until the eighth day, the 30th April, the day on which it was inspected by Dr. R. C., as reported above. It was seen again for the last time by Dr. R. C. on Saturday, the 9th May. On Monday Mrs. S. took the child to Mr. R. S. H. who had confined her; he informs me that the child was so seriously ill with erysipelas that he sent the mother with it to St. Bartholomew's Hospital, where an order for admission was given to her, but as it was necessary for her to stop in the hospital with the child, she refused it, and brought the child away, and placed him again under the care of Mr. R. S. H. Notwithstanding all that was done the child died two days later.

Mr. R. S. H. informs me that he has no doubt that the child died of erysipelas, and the history of the case points clearly to the fact that the erysipelas originated from the vaccination wound.

Result of other vaccinations with same lymph.

In order to ascertain the result of vaccination performed with lymph from the same calf I have put myself into communication with the three gentlemen from St. Bartholomew's Hospital, and with the parents of the other 22 children who were vaccinated with the same lymph at ——— ———.

Statements of the three students vaccinated at the same time and place as the child G. B. S.

(1.) Mr. G. A. T. F. writes:—"On the third day the " vesicles formed, and for the next few days I felt very ill, " having a temperature of 101°, besides being sick several " times and also (had) a rigor; my arm was very much " swollen indeed, extending from shoulder to wrist, both " axillary and pectoral glands being much enlarged and " very tender, and well marked lymphangitis; this con-" dition lasted for 14 days, the scabs did not come away " till about 10 days ago."

(2.) Mr. W. E. M. states:—"I remember being vacci-" nated with lymph obtained from the same source as that " used for the child you mention. I was vaccinated in five " places on my left arm on Thursday, 23rd April, that " being my first re-vaccination. On Saturday, 25th, " vesicles appeared at the sites of inoculation, a halo of " hyperæmia surrounding rash. At the same time I had " a slight frontal headache and a feeling of general " *malaise*—my temperature taken at 9 p.m. registered " 100·2° F. On Sunday, 26th, the vesicles were larger, " and the several haloes had blended to form one patch of " redness; frontal headache, rather worse; evening tem-" perature 101·6°. On the following day the inflammatory " areola had extended some distance up and down the " arm, accompanied by a good deal of swelling of the " limb; on the inner side of the arm slight streaks of " redness extended towards the axilla and the glands were " slightly enlarged and tender upon pressure. The " inflammation reached its maximum intensity on the " seventh day (Wednesday), the areola extending upwards " as far as the shoulder and downwards to the bend of the " elbow; temperature normal and headache and *malaise* " disappeared. The redness and swelling then gradually " subsided, and on the 16th day the scabs came away, " leaving healthy cicatrices. At present the cicatrices are " of moderate size, somewhat pigmented and otherwise " of natural appearance."

(3.) Mr. A. S. B. reports from notes taken at the time:— " April 23rd.—Inoculated five places, 3 p.m. April 25th, " marks distinctly raised, red blush round each. Occa-" sional itching. Tender gland, size of hazelnut in axilla. " Temperature normal. April 26th, 10 a.m. Along each " scratch is a row of small vesicles (each size of pin's " head) almost fused with each other. Contain clear " serum, inoculated sixth place with some of the serum, " vesicle formed on third day. Temperature 99·4°, " arm and axilla tender. Slight headache and chilliness, " which increased during morning and afternoon. Tem-" perature rose gradually to 102·8° (at 5.30 p.m. when I " went to bed), slept badly, severe headache. April 27th, " Temperature (9 a.m.) 101·1°; arm more painful. Hard, " red area round each vesicle (the serum in which was " slightly turbid). Some œdema of surrounding skin. " Evening temperature 99·8°. April 28th.—Each place is " scabbing in the centre. Serum exudes from under " edges of scab and from a more or less distinct ring of " small vesicles round each scab. Each place surrounded

" (½-in. each way) by a slightly raised, dark red, very hard " patch of skin; on this surface are numerous small " papules. Back and sides of upper arm œdematous and " slightly reddened, the œdema spreading over the ole- " cranon an inch down the forearm. Gland, size of walnut " in axilla. Temperature still above normal. (I did not " take any notes after the 28th, what follows is from " memory.) April 29th, 30th.—Inflammation of arm has " begun to subside; less œdema of upper arm. Well " defined patch of œdema over outer and posterior part of " upper half of forearm. Skin over it not reddened. " (Dr. R. C. saw the arm in the afternoon.) I believe the " scabs were detached early in the third week. The " ulcers have been completely scarred over three or four " weeks now. The cicatrices are still redder than the " surrounding skin."

Consideration of foregoing statements.

With regard to the above statements, it should be noted that of the three gentlemen vaccinated, Mr. A. S. B. was the only one who at the time possessed any experience of vaccination by previous study of the subject. He had attended four times previously at the vaccination station, Mr. G. A. T. F. only once, and Mr. W. E. M. not at all. Whilst, therefore, their statements cannot be classed with those of entirely unskilled observers, neither can they be accepted as those of thoroughly trained and competent persons.

In corroboration of Mr. G. A. T. F.'s statements Dr. J. P. Weber, house physician at St. Bartholomew's Hospital, writes:—" The arm certainly was rather inflamed when he " showed it to me, and reminded me of the unhealthy sores " one so often sees from scratches and slight abrasions on " the limbs in out-patients here; with some enlargement of " the glands. I was able to assure him it was not erysipelas."

It thus appears that in the cases of the three adults re-vaccinated at the same time and place as the child G. B. S., there was more than normal inflammation round the vesicles, and constitutional disturbance, making due allowance for the fact that these are often more severe in secondary than in primary vaccination; in the case of the child G. B. S. there was fatal erysipelas.

The 22 other cases vaccinated with same lymph.

The other 22 cases vaccinated with the same lymph (mentioned in Dr. R. C.'s report) have with one or two exceptions been communicated with, and where possible the child has been seen. The result of these vaccinations, as far as I have been able to ascertain it, has been satisfactory in every case. They are given in an addendum to this report.

Considerations as to lymph used.

There is no evidence to show that the lymph used for the vaccination of G. B. S., and the three medical students differed in any way from that used to vaccinate the 22 children above referred to, except that the lymph used to vaccinate the former had been stored on ivory points, whilst the latter were vaccinated direct from the calf.

Storage of lymph.

Without the most scrupulous care it is obvious that the storage of lymph upon ivory points, especially if exposed to the vitiated atmosphere of a crowded room is not free from danger, and presents possibilities of contamination which are not present if capillary tubes are used. In this case, however, the results of vaccinations performed with the 80 points sent to the Local Government Board seem to have been quite satisfactory, and there is no ground for suspecting that the whole batch of points was exposed to any source of contamination. The 80 points were distributed to 20 doctors, 16 of whom have sent in returns which I have examined; there is only a single instance in which the amount of inflammation called for comment; Mr. H. T., of ——, reports one case in which the areola was large. The four remaining reports have not been received.

Results of stored lymph from calf. No. ——.

Possible contamination of lymph.

From the time at which in the case of the child G. B. S., the blush first appeared, 57–69 hours after vaccination, it would seem likely either that the lymph itself was at fault or that some accidental contamination occurred at the time of vaccination. The above considerations practically negative the former supposition.

With regard to the latter the handkerchief used for wiping the wound naturally suggests itself, but I have been unable to elicit any fact which lends strength to this supposition; whilst the fact that none of the cases vaccinated at the same time as G. B. S. appear to have run a normal course makes it *prima facie* probable that the abnormality in each case was due to the same cause, and not to anything which took place in the child's home, which not so clean as otherwise to make such a thing unlikely.

Whether some accidental contamination of the points occurred in their transit from —— ——, to —— ——, or at the latter place where they were taken by Dr. R. C. (and used in the ordinary way), it is impossible to say. I have been unable to detect any proof that this was the case.

There was another possible source of danger. A. M. S., of —— (and since of ——), having been vaccinated on the 16th April, was requested to return on the 23rd April for the purpose of obtaining lymph. On inspection, however, it was found that the arm was inflamed, and in consequence no lymph was taken from it; but the vesicles were opened. (This case has since been seen by Dr. R. C. and subsequently by myself. The child is well and there are four normal cicatrices.)

After careful inquiry I cannot trace any negligence with regard to the lancet used for the opening of the vesicles on the child, G. B. S.'s arm, or any direct contact between the children A. M. S. and G. B. S.

Such evidence, however, as I have been able to obtain on these points is of so uncertain and contradictory a nature that it is useless.

Dr. R. C. thinks all the vaccinations had been performed *before* Mrs. S., the mother of A. M. S., arrived.

Mrs. S., the mother of A. M. S., and Mrs. S., the mother of G. B. S., whilst making various contradictory statements, both say that the child G. B. S. was vaccinated *after* the vesicles on the child A. M. S.'s arm had been opened, and it appears reasonably certain that they left the vaccination station together.

With regard to the lancet, Dr. R. C. states that it is his practice to use a different kind of lancet for opening vesicles to that which he uses for vaccinations.

There seems to be no doubt that the child G. B. S. died of erysipelas following directly on vaccination. The consideration of the foregoing facts points to the following conclusions:—

(1) That some cause for the erysipelas was probably at work which affected all the members of the small group of persons vaccinated at —— —— on the 23rd April, since in each case more or less abnormal symptoms were present.

This excludes the suggestion that the contamination of the wound in the child G. B. S. was produced by the use of the handkerchief or the child's dirty surroundings.

(2.) That the infection was not due to any essential defect in the whole batch of lymph taken from calf No. ——, since the results of the vaccinations performed with the same lymph direct from the calf were, as far as could be ascertained, satisfactory, in all cases, and there is no evidence to show that the rest of the stored lymph from the same calf (the 80 points supplied to the Local Government Board) produced abnormal results.

(3.) That the infection was probably due to some accidental contamination of the four lymph points used at —— ——, or to some infection of the wounds at the time of vaccination, the period at which in each case the abnormal symptoms presented themselves suggesting that the infection may have occurred at this time.

(4.) That with regard to the actual means of infection, whether it was due to some accidental contamination of the lymph points themselves, or to some accidental and untraced contact with the child A. M. S., or, as it may be, to some cause wholly unexpected and unknown, the want of fuller and more reliable evidence on some important points makes it impossible with any degree of certainty to state.

THEODORE DYKE ACLAND, M.D.

1.—*Cases vaccinated at —— —— on the 23rd April with lymph, stored on ivory points, from calf No.* .

No.	Name.	Remarks.	Results.
1	G. B. S. -	Age four months, primary vaccination. Erysipelas commencing third day.	Death, 21st day.
2	Mr. G. A. T. F.	Age 24 years. Re-vaccination. Rigor. Vomiting. Temp. 101°, diffused inflammation extending from shoulder to wrist 14 days; scabs remained attached for six weeks.	Good.
3	Mr. W. E. M.	Aged 22 years. Re-vaccination. Blush round vesicles on second day. Temp. 101·6°. On third day inflammation extending, reaching maximum on seventh day from shoulder to elbow.	Good.
4	Mr. A. S. B. -	Re-vaccination. Temp. on third day 102·8°. Much headache. On fourth day areola hard and painful, some œdema of surrounding skin. On fifth day the swelling extended to forearm.	Good.

2.—Vaccinations performed from same lymph direct from the calf.

No.	Name.	Remarks.	Results.
1	F. S.	Normal course	Good.
2	W. J.	Healthy child. Normal course	Good.
3	E. C.	Normal course	Good
4	F. W. C.	Normal course. Feeble child. Better since date of vaccination.	Good.
5	E. H.	Reported to be in good health	Good.
6	H. J. W.	Reported to be in good health	Good.
7	H. A. P.	Reported to be in good health	Good.
8	L. A.	Normal course	Good.
9	H. W.	Normal course. Healthy child	Good.
10	G. W.	Normal course	Good.
11	A. C.	Reported by mother to have done perfectly well.	Good.
12	G. H.	Normal course. Healthy child	Good.
13	D. L.	Cannot be found	—
14	J. P.	Normal course	Good.
15	J. P.	Normal course	Good.
16	H. B.	Normal course. Some rash. No inflammation.	Good.
17	E. C.	Normal course. Healthy child	Good.
18	A. M.	Cannot be found	—
19	G. C.	Cannot be found	—
20	W. C.	Normal course	Good.
21	J. E.	Normal course	Good.
22	G. G.	Normal course	Good.

CASE 55, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of F. A. E. An inquiry was made into this case by a Medical Inspector of the Local Government Board; and an analysis of his report is given on page 66, where the case is numbered as Case CLXXXVI.

CASE 56, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of J. L. An inquiry was made into this case by a Medical Inspector of the Local Government Board; and an analysis of his report is given on page 66, where the case is numbered as Case CLXXXIV.

CASE 57, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of G. C. An inquiry was made into this case by a Medical Inspector of the Local Government Board; and an analysis of his report is given on page 61, where the case is numbered as Case CLXXII.

CASE 58, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of L. S. D. An inquiry was made into this case by a Medical Inspector of the Local Government Board; and an analysis of his report is given on page 62, where the case is numbered as CLXXV.

CASE 59 [SERIES], REPORTED TO THE COMMISSION BY MR. J. H. LYNN.

Case of J. H. and E. W.: report to the Commission of Dr. Theodore Dyke Acland.

J. H., of ——, was vaccinated on Wednesday, the 13th May 1891, together with three other children, E. W., of ——, M. W., of ——, and T. B., of ——.

Of these, the last three children, E. W., M. W. and T. B., were vaccinated by Mr. C. L.; J. H. by his assistant. It seems to have been an accident that they were not all vaccinated by Mr. C. L.; a gentleman having, I am informed, come in during the vaccinations to speak to Mr. C. L., who, being thus called away, left Mr. S., his assistant, to act for him.

Mr. C. L. assures me that he uses all reasonable precautions as to the source of lymph and the cleanliness of instruments; he endeavours to carry out the spirit of the instructions given to him by the Inspector of the Local Government Board, and he states that the lancet is invariably dipped in water and wiped between each vaccination.

Source of lymph. The four children were vaccinated with lymph taken directly from the arm of J. B. of ——.

Vaccinifer. This child J. B. was visited by me on Friday, the 12th June. He is a strong and vigorous infant, with firm flesh and good colour. Considering the conditions under which he is living he seems to be a remarkably healthy child. The cicatrices are normal, with no sign of surrounding inflammation, nor is there any evidence of sloughing having taken place round the vesicles; from all I could see, the child was a very proper one from which to have taken lymph.

Children vaccinated from J. B. J. H. and the three other children vaccinated from J. B. were also all visited on the same day. Their condition is as follows:—

J. H. is the youngest child of a family of six, all of whom have been vaccinated without any mishap by Mr. C. L. He is a well developed child, with firm flesh and clear complexion, but somewhat pale. He is fretful, doubtless from the condition of the arm. The photograph forwarded by Mr. Lynn gives no adequate representation of what the wound now is. It is now (four weeks after vaccination) covered with firm dry cicatrices. There is no discharge issuing from any of the wounds. There is no surrounding induration, nor is there any sign of active inflammation; he glands in the axilla and neck are not enlarged. The scabs are all united into one, and are much the same shape of the ulcers represented in the photograph. There has apparently been some loss of tissue, as there is a distinct depression horizontally across the base of the wound. There has been inflammation with some suppuration, which has now ceased under treatment, and there is no reason to doubt that the child will completely recover. There is not and has not been any general eruption on the skin. The surface of the body is cool and natural. The child has no vomitting, diarrhœa, sweating, or any sign of constitutional disturbance, and, except that it is fretful, the mother is well satisfied with its general condition. The inflammation was not noticed either by Mr. C. L. or by the mother until after the eighth day, and was therefore probably due to excessive reaction during the formation of the areola rather than to any specific poison inoculated with the vaccine virus, The father and mother are healthy. Their surroundings are very poor and dirty.

E. W. looks and is reported by the mother to be well. The mother says that there has been much inflammation surrounding the vesicles. This is borne out by the fact that there is still cicatrisation going on; but the wounds look well and healthy. There is no surrounding inflammation. From the present appearance of the arm it would seem that the formation of the areola had been attended with considerable inflammation, which has now entirely subsided. The constitutional state of the child is healthy. It may be added that an older child has had a severe attack of measles in the same house, and is only now recovering; that he has severe conjunctivitis of the right eye, with much superficial inflammation and some sloughing of the cheek, a condition likely to be a source of grave danger to any open wound such as that produced by vaccination. This child is said to have been ill for one month.

M. W., a miserably thin child; surroundings dirty and poor in the extreme. Child's personal condition no better than the surroundings. The vaccination vesicles have not yet healed; there is a good deal

of surrounding irritation. The scabs have been rubbed off and the wounds greatly irritated by the edge of a stuff sleeve, which is saturated with pus and dirt. The child has never been well nourished. There is no sign of constitutional disturbance.

T. B. Vaccination has proceeded normally. The mother reports "there is nothing wrong, and never "has been." The scabs are large and are composed in great part of Fuller's Earth, making them look like hard clay crusts.

Conclusion. I have not been able to obtain any evidence to show either that the lymph or the manner of performing the vaccination was at fault. The condition of the arm is sufficiently accounted for by excessive reaction during the period of the formation of the areola, and there is no cause to apprehend any permanent injury to the child.

THEODORE DYKE ACLAND, M.D.

CASE 60, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of B. E. A. An inquiry was made into this case by a Medical Inspector of the Local Government Board; and an analysis of his report is given on page 63, *where the case is numbered as CLXXVIII.*

CASE 61, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of P. K. An inquiry was made into this case by a Medical Inspector of the Local Government Board; and an analysis of his report is given on page 64, *where the case is numbered as Case CLXXX.*

CASE 62, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of R. J. G. M. An inquiry was made into this case by a Medical Inspector of the Local Government Board; and an analysis of his report is given on page 63, *where the case is numbered as Case CLXXVII.*

CASE 63, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of C. F. An inquiry was made into this case by a Medical Inspector of the Local Government Board; and an analysis of his report is given on page 61, *where the case is numbered as Case CLXXIII.*

CASE 64, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of K. I. B. An inquiry was made into this case by a Medical Inspector of the Local Government Board; and an analysis of his report is given on page 59, *where the case is numbered as Case CLXX.*

CASE 65, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of H. S. An inquiry was made into this case by a Medical Inspector of the Local Government Board; and an analysis of his report is given on page 69, *where the case is numbered as Case CXCIV.*

CASE 66 [SERIES], REFERRED TO IN THE PUBLIC PRESS.*

Case of certain children of Oberursel, Prussia. Copy of a letter received by the Commission from the Foreign Office.*

SIR, Foreign Office, 1st September 1891.

WITH reference to your letter of the 23rd of June last I am directed by the Secretary of State for Foreign Affairs to transmit to you, to be laid before the Royal Commission on Vaccination, the accompanying Note from the German Government on certain alleged cases of death from Vaccination near Wiesbaden.

I am, &c.

The Secretary, JAMES FERGUSSON.
The Royal Commission on Vaccination.

(*Enclosure.*)

Translation.

Ministry for Foreign Affairs,
August 26, 1891.

Note-verbale.

The Ministry for Foreign Affairs has the honour to inform the British Embassy with reference to their note-verbale of the 25th of June ult. concerning the deaths which occurred at Oberursel in May, presumably from vaccination, of the result of the official enquiry which is contained in the enclosed notice.

Her Britannic Majesty's Embassy.

Notice.

The deaths in question are in no way connected in their origin with previous vaccination.

According to the report of Dr. N., vaccinating physician of Oberursel, a report which has been confirmed by the Government authorities of the district (Königliche Landrathsant) and also by the chief local medical office (Kreis-Physikat), the deaths in question were those of the children of K., a builder, and of A., a farmer.

Both children had been vaccinated with about sixty other children on the 23rd of May ult. The child of the builder K. sickened very shortly after the vaccination from May 25–26. It had symptoms of fever and a cough, also symptoms of an acute bronchial-catarrh which extended over both lungs. In the further progress of the illness the child who was teething at the time was seized on June 3 with continuous convulsions resulting from irritation of the brain, and died from them on June 5. Throughout the whole of the illness the vaccination pustules went through a thoroughly normal course; they were neither red, nor was the part near them inflamed and they dried in a quite usual way. A.'s child fell ill on June 2 with an acute inflammation of the right lung. The course of the illness was very rapid, and the child died in two days. There was nothing abnormal in the pustules: they were not red nor was the part near them inflamed.

According to this report both children died of illnesses which it is true occurred at the same time as the vaccination, but which cannot in any way be originally connected with it and of which both children could at any other time have fallen ill and died without having been vaccinated.

If we take into consideration the fact that unhealthy symptoms, which might naturally have been expected to appear after vaccination on the parts affected, were completely absent, and that the pustules in the case of both children, as in the case of all the other children vaccinated at the same time and with the same vaccine, were throughout in a thoroughly normal condition, we may with certainty maintain that the death of both children did not occur in consequence of vaccination, and that its occurrence at that time was a mere coincidence.

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* *The statement, which appeared in "The Echo" of the 9th June 1891, was as follows: "Fatal Vaccination.—Berlin, June 9.—During "last month every infant vaccinated by the medical authorities of the "town of Oberursel, near Wiesbaden, has died. Eleven deaths have "thus far been reported, and an investigation has been ordered into "the character of the lymph, which is believed to have been poisoned."*

The report which appeared in the "Frankfurter "Zeitung" representing the death of the children as the result of vaccination was originated by the zealous anti-vaccinationist M., who attempted to make use of both cases to stir up agitation against vaccination.

CASE 67. REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of A. M. J. An inquiry was made into this case by a Medical Inspector of the Local Government Board; and an analysis of his report is given on page 68, where the case is numbered as Case CXCI.

CASE 68. REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of S. A. S. An inquiry was made into this case by a Medical Inspector of the Local Government Board; and an analysis of his report is given on page 68, where the case is numbered as Case CXC.

CASE 69. REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of W. H. H. An inquiry was made into this case by a Medical Inspector of the Local Government Board; and an analysis of his report is given on page 69, where the case is numbered as Case CXCII.

CASE 70. REFERRED TO IN THE PUBLIC PRESS.

Case of B. C. T. Copy of the depositions taken at an Inquest held on the body of B. C. T., and of the verdict returned by the Jury.

The Informations of Witnesses severally taken and acknowledged on behalf of our Sovereign Lady the Queen, touching the death of B. C. T., at ——, on the 27th Day of June, in the year of our Lord One Thousand Eight Hundred and Ninety-one, before me, W. E. B., Esquire, one of Her Majesty's Coroners for ——, on an Inquisition then and there taken on view of the body of the said B. C. T. then and there lying dead.

A. M., having been sworn upon the day and year and at the place above mentioned, deposed as follows:—

I reside at ——. I am M.D. and registered. Deceased was brought to me at 10 a.m. on Wednesday last suffering from convulsions from dentition, since he had been vaccinated. I examined his arm; vesicles healthy; child appeared healthy and well cared for. My brother attended her in her confinement. Labour natural. Cause of death, convulsions from dentition.

E. T. upon her Oath saith:—

I live at ——. I am the wife of G. T., a labourer at a chemical works. The deceased was my son; his name was B. C. T.; his age was five months. On Tuesday June 16th he was vaccinated by Dr. B. He then seemed all right and on Monday 22nd he was restless during the night. I gave him a powder which I got from a chemist. On Tuesday 23rd he seemed a little better. On Wednesday 24th about 7 a.m. he was taken as if in a fit and worked his arms about. I took him to Dr. M. His assistant saw him and prescribed for him. He got worse about 12.30 p.m. I sent for Dr. M. He came about 1 p.m., and ordered him to be put in a mustard bath, which I did and he died about 3 p.m. He has met with no injury that I know of. I have had seven children; five are now living; one inquest before. It was about three years ago on a child aged three years who fell down in the street. This one's life is insured and I get 1*l.* 10*s.* by his death. He was full-timed; labour long but nothing peculiar. I have five children living.

M. A. F. upon her Oath saith:

I live in the same house. I am the wife of J. F., an advertising agent. On Tuesday and Wednesday 24th June I was called to see the deceased about 10.0 a.m. He then seemed in a fit. The mother took him to Dr. M. and he remained in fits and died about 3.0 p.m.

I have known his mother seven or eight months, she is most respectable. Child healthy. Every care taken of him. No injury.

(*Verdict.*)

Convulsions from dentition. Natural causes.

CASE 71. REPORTED TO THE COMMISSION BY MR. J. H. LYNN.

Case of M. A. N.: report to the Commission of Dr. Thomas Barlow.

On the 17th July 1891, I visited ————, at the request of the Royal Commission on Vaccination, for the purpose of investigating the case of M. A. N. Dr. C. L., the Public Vaccinator, showed me his register, from which it appeared that M. A. N. (No. 443 in the register), aged three months, was vaccinated at his surgery on the 3rd June 1891, four insertions being made. The lymph was derived from F. S. (No. 432), aged three months, of ————. M. A. N. was inspected on the 10th June, and was considered then to be satisfactory. She was brought to Dr. C. L. about ten days subsequently. The arm was then a little inflamed but there was no eruption or abscess. No child was vaccinated from M. A. N., Dr. C. L. preferring not to take the lymph from it as it was a twin and a small baby. The other twin Dr. C. L. had declined to vaccinate because he considered it rather feeble. The vaccinifer, F. S. had been vaccinated at the surgery on the 27th May; the lymph being derived from S. S. (No. 428), aged five months of ————. F. S. was inspected on the 3rd June at the surgery and was considered satisfactory. I saw Dr. C. L.'s surgery and found it suitable in every respect. He showed me the instrument used by him in vaccination; it was a spud-like instrument, No. 240 in Mappin's list, quite suitable and clean, being kept in a box wrapped up in cotton wool. Dr. C. L. informed me that it was not used for any other purpose. Two were used for vaccination, but one of these had been sent to be repaired.

I examined M. A. N. at her own home. The child presented four vaccination sites on one shoulder; one was cicatrised, two were covered with small scabs, and one presented a very slight discharging surface; there was no areola of redness around any of these vaccination sites; they were none of them larger in diameter than a quarter of an inch; there was no enlarged gland to be felt in the armpit. Beyond the fact that two of the scabs had not separated, and the small discharging sore which implied rather an indolent condition, the whole appearance of the shoulder was very quiet and devoid of any cause for anxiety. The child was rather puny and sallow, but there was nothing abnormal to be found in the viscera, and the skin was normal. The mother stated that the child had had no rash or abscess; there was no complaint beyond the fact that one of the vaccination sites had discharged a little. I saw the other twin child who had not been vaccinated; it was very much feebler and more puny than the one which had been vaccinated. I draw attention to this because in Mr. Lynn's letter to the Commission, a copy of which is appended to this report, it is stated that the unvaccinated twin was healthy. The condition of these children, as well as that of another member of the family, aged two, who was examined by me, was exceedingly dirty, and the house was also very dirty.

F. S. of ——. This child presented four vaccination scars a third of an inch in diameter; they were quite normal. The skin elsewhere was natural; there were no gland enlargements; the child was healthy. The mother informed me that the child had been vaccinated on the 27th May and that the vaccination had proceeded quite naturally in every respect. This woman, Mrs. S., had had sixteen children, of whom only six were living. Of the ten who died, one had died at four months, and the others above two years old. *Vaccinifer.*

S. S., of ——, from whom F. S. was vaccinated, presented four vaccination cicatrices, a third of an inch in diameter, quite normal. There were no enlarged glands—there was no rash, and the child was in fairly healthy condition. The mother informed me that the *Vaccinifer of vaccinifer.*

scabs came off well, that there was no trouble of any "kind, and that it was "as nice a baby's arm as could "be."

Co-vaccinees of vaccinifer.

J. G., aged five months of ——, was a co-vaccinee with F. S., the vaccinifer of M. A. N. There were four small vaccination sites; two scabs just about to drop; the other two places normal cicatrices; there was no gland swelling. A little moist eczema was present in the right groin of about a fortnight's duration. The child was otherwise healthy. The grandmother informed me that the child had no trouble, but that some of the scabs came off too soon. The house was exceedingly dirty. Some of the other children had impetigo of the face. The children were very dirty.

J. A. B. of —— was also a co-vaccinee with F. S., the vaccinifer of M. A. N. There were four vaccination cicatrices, each a third of an inch in diameter; quite normal. There were no gland swellings, and there was no rash on the body. The child was healthy. The mother says that the scabs came off in three weeks, and that in every way the case did well. This was the only clean child that I saw.

Comments.

There is no evidence of anything wrong in the lymph used, or in the method of vaccination of M. A. N. The vaccinifer, F. S., was satisfactory, and in only one, J. G., of the co-vaccinees of the vaccinifer was there anything abnormal. In that case there had been delay with respect to two of the vaccination sites, probably due to two of the scabs having been rubbed off, slight discharge, and fresh scabs being formed. In M. A. N. the discharging sore was quite minute, less than a quarter of an inch in diameter. There was absolutely nothing which could not be explained by the somewhat feeble nutrition of the child and the dirty surroundings. I wish to protest in the strongest way against the contrast drawn in Mr. Lynn's letter between the unvaccinated twin child alleged to be healthy and the vaccinated twin alleged to be ill and emaciated. The unvaccinated child was puny and miserable to an extreme degree. The hygienic conditions in which most of these children at ——— were found were as unfavourable as could well be conceived. The atmosphere of the neighbourhood is charged with dust from the chemical works, so that no vegetation will grow. The houses were exceedingly dirty and the children were amongst the dirtiest that I have ever seen. There was no attempt at protection of the vaccinated arms. In one house the infant was being nursed by another child who was exceedingly dirty. Delay in repair was, I am confident, in part referable to the carelessness involved in not protecting the vaccination pocks. The five cases inspected by me showed that Dr. C. L. must be a very careful vaccinator. He had evidently obtained facility in getting very neat vaccination sites under the most unfavourable conditions. I was struck with the pains and solicitude which he had taken in his work.

THOMAS BARLOW, M.D.

(Copy of letter from Mr. J. H. Lynn.)

19, Vesta Road, Brockley,
London, S.E.,
8th July 1891.

DEAR SIR,

ALLOW me to present the following report, and to urge that the case be seen as early as possible that the Commissioners' Inspector may more perfectly know the true condition of the sufferer.

M. A., child of H. N., widow, of ———, was born March 3rd, 1891, and vaccinated May 27th by the assistant to the Public Vaccinator, Dr. C. L., from child's arm. She was quite well before the operation. The vaccinated arm became *badly* ulcerated in four places and the child is now ill and emaciated. She is one of twins. Mrs. N. is healthy. There are five other children who were vaccinated without any ill effects, all healthy; and the other twin, unvaccinated, is healthy. The cause of the father's death was bronchitis.

Yours, &c.
J. H. LYNN.

Bret Ince, Esq.

CASE 72, REPORTED TO THE COMMISSION BY MR. J. H. LYNN.

Case of N. A. C.: report to the Commission of Dr. Thomas Barlow.

Concerning the case of N. A. C., of ————, I obtained the following information from Dr. S. of ————: On the 16th April 1891, the following children were vaccinated by him from calf lymph at his surgery, N. A. C., A. H., M. A., and R. J. B., and also at the ——— Bank, A. J. F., the child of the manager of the Bank. These entries I have verified from Dr. S.'s book. He informs me that he used one or two tubes of calf lymph obtained from Dr. R.'s establishment.

On the 23rd April 1891, he vaccinated at the surgery the following children, W. H. S., H. S. W. and F. S——n; and at ——— he vaccinated U. The lymph used for vaccinating the above children was derived from one or other of the four children vaccinated on the 16th April, namely, N. A. C., A. H., M. A., and R. J. B. I saw some of Dr. S.'s tubes, and he showed me his method; namely, to blow a little lymph on to his lancet and then scarify in three places. He allowed a stream of water to run over the lancet before using it for another case; and the lancet was not employed for any other purpose than vaccination.

I visited as many of the above children at their own homes as I could find; in some cases the people had removed, and could not be traced.

N. A. C., the subject of this report, of ———— *First va... (4) N.A.*

History given to me by the mother. The child was born on the 12th January 1891, and vaccinated on the 16th April with calf lymph by Dr. S. in three places. On the eighth day the three places had taken well, and there was some redness down to the elbow. There was nothing else of importance except that the child was rather fretful. She was taken to Dr. S., and three other children were vaccinated from her. The progress was satisfactory for fourteen days, then one of the scabs came off, and after this some fresh redness appeared from the shoulder down to the elbow. Dr. S., on coming to see it, was surprised because the vaccination places themselves did not look angry. The child was hot and looked ill. There was no vomiting. The redness extended within another week to the tips of the fingers, across the back and chest, to the right arm pit and to the right hand. Subsequently two white places formed on the right hand which were poulticed and matter came from them; and then two abscesses appeared below the right elbow, which were poulticed and discharged matter. Subsequently two abscesses appeared in the left arm pit, and then a large abscess in the right arm pit. Dr. S. attended from the 8th May to the 16th June. All were then healed, except the one in the left arm-pit, and in another week this was healed. A fortnight ago a few blister-like spots appeared on the belly, and they went away in a few days. The mother has noticed that the child is peculiar, has strange movements about the eyeballs, keeps the mouth open, and protrudes the tongue in a strange way; but, on inquiry, it is clear that these movements existed before vaccination. There are important facts as to the house and family, which are not referred to in Mr. Lynn's letter to the Commission, a copy of which is appended to this report.

Firstly, *as to the family*. The night after this child was vaccinated one of the children showed the first signs of measles. Three children took it in succession, and two of them were bad with it. The mother did her best to keep the baby away from the others, and she affirms that the baby did not take the measles. She observed, however, that a slight rash, very like the measles rash, appeared about the abdomen during the time that the other children had the measles; the actual date she cannot give.

Secondly, *about the house*. During the whole of the time that N. A. C. was ill there were frequent stoppages with respect to the water-closet. I find now (5th August 1891) that they have just had a new cistern fixed, and the closet appears to be satisfactory.

Condition of the child N. A. C., when examined by me on the 5th August 1891. There are three vaccination scars, situated on the left shoulder, each not bigger than half an inch in diameter. There are two scars, the remains of abscesses, in the left armpit; two scars on the back of the left fore-arm not adherent to the bone; one in the right arm-pit; two on the back of the right hand; the nail

of the right thumb is badly developed. There are no enlarged glands now to be felt. There are a few small superficial scars on the lower part of the abdomen and in the right groin. The child has a very flat nose, and a malformed right external ear; it has continual rotatory movements of both eyeballs (nystagmus). The tongue is frequently protruded unduly, and there is a malformation dependent on the absence of the frenum linguæ. The child has beaded ribs and some bronchitis. The four children were seen—they all presented remains of impetigo on the face or hands, and were not healthy children. I saw the child N. A. C. again three months afterwards, and found her in much better condition; the cicatrices were all sound, but the protrusion of the tongue and the rotatory movements of the eyeballs were still present.

A. H. A. H. (co-vaccinee with N. A. C.) cannot now be traced on account of removal. Mrs. L., with whom she formerly lived, at ————, reports to me that A. H. was vaccinated from calf lymph, had a severe arm, but got over it quickly; she was quite well within a month; had no abscesses and no rash.

M. A. M. A. (co-vaccinee with N. A. C.), aged six months, seen by me at ————. There are three small vaccination cicatrices not more than a quarter of an inch in diameter; no gland enlargements in the armpit. The child is rather thin, has a little eczema; is bottle fed, and has had whooping cough for two months. The father reports that the child was vaccinated on the 16th April; had rather a full arm, and a slight swelling under the armpit, but the scabs came off in about one month, and there was no further trouble with the vaccination.

R. J. B. R. J. B. (co-vaccinee with N. A. C.), aged seven months, of ————, seen by me. There are three vaccination scars half an inch in diameter; normal. There are no gland enlargements in the armpit. The child is healthy and is breast fed. The parents report that the child bore the vaccination well; there was a little redness on the fifth day, extending down to the wrist, but there was no trouble after this and the scabs cleared off within a month.

A. J. F. A. J. F. (co-vaccinee with N. A. C.), aged eight months, seen by me at the ———— Bank, ————. There are three vaccination cicatrices, one-third of an inch in diameter; there are no gland enlargements and there is no eruption on the skin. The child is healthy. The parents inform me that the child was well over the vaccination within three weeks.

...ated. Sub-vaccinees from N. A. C. or A. H. or M. A. or R. J. B.; uncertain which, but it is certain that some of them were from N. A. C.

H. S. W. H. S., of ————. There is one vaccination cicatrix on the shoulder—there are no gland enlargements. The child is healthy and free from eruption.

History given by the parents:—The child was vaccinated in three places on the 23rd April from a baby's arm (one of the N. A. C. set). Only one place took. There was no trouble with the vaccination; the scab came off at the end of 14 days. During the time some small red spots appeared on the limbs, face, and body, which were very like "red-gum." They did not form matter, and died off *in four days*.

...S.W. H. S. W., of —— ——. There are two vaccination cicatrices; normal. The parents report that the child was vaccinated on the 23rd April from a baby who had been vaccinated with calf lymph. There was no trouble with the vaccination or afterwards.

F. ...n. F. S———n, ten months old, of —— ——. There are three vaccination sites, varying from one-eighth to one-third of an inch in diameter. There are no gland enlargements. The child is healthy and free from eruption. The parents report that there was no trouble with the vaccination and no rash.

...nts. The uncertainty as to derivation of the lymph, and also the uncertainty in the second series as to which infant of the four, namely, N. A. C., A. H., M. A. and R. J. B., was used as vaccinifer in the members of the second series, makes the report inconclusive in some respects. It is certain that N. A. C. was used as vaccinifer for more than one of the second series, and, as nothing of importance occurred in the members of the second series, it may be taken for granted that the lymph removed from N. A. C. was satisfactory. With respect to N. A. C. herself, there was nothing of importance until a fortnight after the lymph had been removed, and then it was that a rather severe erythema extended over the vaccinated shoulder and arm, and the child became hot and ill. It was specially noted that at that time there was nothing angry about the vaccination places. This erysipelatous inflammation was followed by abscesses in both armpits and on both arms.

There are two important possible factors to be remembered in connection with the above, namely, (1), that three of the children in the house were suffering successively from measles at this period which the mother concealed from Dr. S ——, and it is possible that the infant herself contracted the disease; and (2) that the condition of the water-closet was very unsatisfactory during all this period.

The appearances referred to in Mr. Lynn's letter, namely, the protrusion of the tongue and the strange movements of the eyeballs, were undoubtedly present before the vaccination. They probably depend on some malformation of the brain, and the child is almost certainly an idiot.

THOMAS BARLOW, M.D.

(*Copy of letter from Mr. J. H. Lynn.*)

19, Vesta Road, Brockley,
London, S.E.
15th July 1891.

DEAR SIR,

PERMIT me to submit the following case for inspection:—

N. A. C., daughter of S. and M. E. C., of ————, was born on the 12th January 1891, and vaccinated on the 16th April with calf lymph, by Mr. E. R. S., M.R.C.S., of ————, their family doctor. The course of the vesicles was normal. Four other children were vaccinated from the arm of this child. On the 8th of May *the vaccinated arm* was very much inflamed and the child was at once taken to Dr. S. In a day or two the inflammation spread down the arm to the hand, across back and chest, down the other arm to the hand, both swelling double the usual size. Abscesses then developed, of which she has had seven. One on the right hand was so bad that the skin peeled off and the hand was raw for some time with a deep hole at the seat of the abscess. The others were as bad or worse.

The doctor ordered the vaccinated places to be poulticed to relieve her. The child recovered somewhat and the doctor dismissed her about five weeks back, but she is subject now to blisters and discharge, looks very strange about the eyes as if the pain she had endured had affected her brain, and her tongue often strangely protrudes. She is in a very sad condition now, extremely restless and apparently in pain.

The parents are healthy and the family. There are four other children. There have been no deaths.

Yours, &c.,
J. H. LYNN.

Bret Ince, Esq.

CASE 73, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of F. C. B.: report to the Commission of Dr. Theodore Dyke Acland.

F. C. B., of ——, was vaccinated at —— with 50 other children direct from calf No. —— on the 23rd June 1891, and was inspected on the 30th June, taken to Dr. I. with inflammation of the arm on the 7th July, and died on the 24th July.

Course of vaccination.

Mrs. B., a friend, who held the child when it was vaccinated, states that the vaccination was performed in five places by Dr. R. C. Both Mrs. B., the mother of F. C. B., and Mrs. B., the friend, agree in stating that the arm was unnaturally red round the points of inoculation before they reached home on the day of vaccination. There is, however, no ground for believing that this could be due to inflammation caused by the vaccination; but I can elicit no further information as to the supposed early irritation of the wound either from the parents, from Mr. A., or from Dr. I., the latter of whom did not see the child until 14 days later. The wound was not tampered with in any way, nor was any external application made to it. The vesicles formed on the third and fourth days. On the 8th day the child was inspected by Mr. A., not by Dr. R. C., as it appears to be a rule that the children are inspected on the 8th day by Mr. A., the clerk, who is directed to report to Dr. R. C. in case of any abnormal condition occurring. In this case nothing abnormal appears to have been noticed, the areola was moderate, no record was made of anything being wrong; and I cannot ascertain that Mrs. B., the friend, who has children of her own, had any suspicion

that anything was wrong. No advice at any rate was asked and no method of treatment was suggested by Mr. A. The vesicles were not opened and no lymph was taken from them. After the 8th day the inflammation is reported to have spread from the vesicles, and on the 13th day it had extended to the elbow.

Mrs. B., the mother of F. C. B., became alarmed, and on the 7th July, the 14th day, the child was seen by Dr. I., who reports: "I examined the left arm and found that the whole "of it was much swollen, the five pock marks had become "ulcers and were open and were discharging pus freely, "the arm was erysipelatous as far as the shoulder above "and the elbow below. I treated the case actively, and "the mother sat up night and day with it. I believe "there was not the slightest neglect, but in spite of this "the erysipelas spread downwards to the tips of the "fingers, then upwards over the shoulder across the chest, "downwards as far as the navel; down the right arm, "also to the finger tips, then over both shoulders and "down the back as far as the bases of the lungs, and "finally it crept all round the neck and up the back of "the head, and the child died."

Cause of death. I have twice seen Dr. I. with reference to the above, and the information which he gave me makes me think it certain that the inflammation from which the child died was a cellulitis spreading from the wound.

Investigation of other cases vaccinated with same lymph. With a view to ascertaining all the possible sources of danger to the child F. C. B., I have inquired into the results in the 50 children who were vaccinated from the same calf on the same day. A schedule is given at the end of this report of all these cases. The general result of my inspection is that the vaccinations were entirely satisfactory in 35 cases, or 70 per cent.; that there was only serious inflammation in one case, and that permanent injury does not seem to have resulted in any one case, except that of the child F. C. B. From this it may be reasonably concluded that the lymph itself was not directly the cause of the erysipelas.

Possible contamination of wound from lymph at time of vaccination. I have not been able to elicit any facts which would lead me to suppose that any contamination of the lymph occurred at the time of vaccination, it was taken straight from the calf, and was not stored or kept.

With regard to possible contamination of the wound from other children:—

Possible contamination from other children. Four cases presenting abnormal vesicles were inspected on the 23rd June, the day on which F. C. B. was vaccinated, but Mrs. B., the mother of F. C. B., states that she kept as far as she could from all other children, and the cases did not come up for inspection until after the vaccinations had taken place, so that, as far as can be ascertained, no contact took place between the child F. C. B. and any of these. None of these four cases suffered from erysipelas; on the 18th September all the cases were well. One had suffered from a small abscess, treated by Mr. Arbuthnot Lane at the Great Ormond Street Hospital, but he does not believe that it had any casual relation whatever with vaccination.

From insufficient care during or after vaccination. The ordinary precautions used at —— were adopted, and they are such as are considered sufficient by the director of that establishment. The wound was in no way interfered with, no lymph was taken from the vesicles; no application was made to the wound, and no shield was used for the protection of the vesicles which could have in any way irritated them and started the subsequent inflammation.

Sanitary condition of child's home. On the 11th September I visited —— and saw Mr. and Mrs. B., the child's parents. The house is large, the basement is occupied with workshops and a shop, a carver and gilder's, Mr. and Mrs. B. live on the upper floor, their rooms are large, fresh, and airy. There is no communication of any kind with any drain in either of the two living rooms occupied by them. Their back windows look out over the workshop, and the front ones into the street. I could find no likely source of illness in the parents whatever. Mr. B. is far above the class of persons who, as a rule, take their children to be vaccinated at the public stations, and I should consider the child's home conditions as most unusually favourable. There are 10 persons living in the house, but I was unable to elicit any information which would lead me to suspect the presence of disease in the house at the time when the vaccination was performed. The mother has been a healthy woman, the father suffered from empyema 12 or 13 years ago, but has entirely recovered and has generally enjoyed good health. These statements are confirmed by Dr. I., who knows the family well, and he says also that the child F. C. B. was strong and healthy before it was vaccinated.

No special prevalence of erysipelas at the time. There were no cases of erysipelas reported in the immediate neighbourhood to the Metropolitan Asylums Board during the weeks from the 13th June to the 11th July inclusive, in fact, the number of cases of erysipelas are rather below the average. I have been able to trace no case of erysipelas to ——- Street, except one doubtful case of erysipelas of the face attended by Dr. I., 15 or 20 houses down the street. There was one case of scarlet fever reported on the 26th June at —— Street, but so far as the mother knows the child did not come in contact with any disease, contagious or otherwise.

Conclusion. All the evidence points to the fact that the child's death was caused directly by a cellulitis starting from the vaccination vesicles at the time of the formation of the areola. I have, however, been unable to trace any contamination either of the lymph used for vaccination or of the vesicles themselves which could have been foreseen or prevented.

THEODORE DYKE ACLAND, M.D.

Cases vaccinated at ——— on 23rd June 1891 with lymph direct from calf No.———,

No.	Name.	No. and present Condition of Cicatrices.	Result of Vaccination.	Remarks as to general Condition of Child.
1	S. J.	5, normal	Good	General health very good; some papular eruption.
2	H. M.	"	"	Always a feeble child; liable to diarrhœa.
3	W. S.	Normal	"	Feeble mother; anæmic infant.
4	J. G.	5, normal	"	Child in excellent health.
5	M. D.	"	"	Marasmus before vaccination, much better since.
6	E. D.	"	"	Papular rash on nates, otherwise well.
7	W. H. C.	Normal	"	In good health.
8	H. C.	"	"	" "
9	G. C.	5, normal	"	" "
10	F. W.	"	"	Inflammation round vesicles was considerable. Eczema.
11	A. W.	Gone away. No address left.		
12	M. C.	5, normal	Good	Inflammation; some eczema.
13	C. H. W.	5, normal	Good	Puny child: depressed fontanelle; vesicles were inflamed.
14	C. G.	"	"	Is teething; rickety child.
15	M. M.	"	"	——
16	M. F.	No reply to inquiries. Subsequently, September 22, reported well and vaccination normal.		
17	E. W.	No reply to inquiries.		
18	F. G.	5, normal	Good	Child well.
19	F. N.	"	"	"
20	W. G. B.	4 cicatrices sloughed into one.	—	Inflammation excessive.
21	F. H. D.	Gone away. No address left.		
22	G. B.	5, small	Good	Child well.
23	M. M.	5, normal	"	"
24	E. F.	"	"	"
25	E. R. B.	5, small	"	Puny child.
26	E. M.	No reply to inquiries. Subsequently, September 21st, reported to have been well. Better since vaccination.		
27	A. G.	4	—	Two cicatrices run into one. Inflammation abnormal.
28	I. C. M. G.	5, normal	Good	Child in good health.
29	R. F.	"	"	Some excess of inflammation.
30	E. W. L.	"	"	Now some eczema of head.
31	F. C. B.	[*Case reported on.*]		Died of erysipelas, July 24th, 1891.
32	F. J.	5, normal	Good	Child in good health.
33	C. W.	"	"	" "
34	L. B.	No reply to inquiries, August 22nd. Could not be found September 22nd.		
35	M. A. W.	5, normal	Good	Child in good health.
36	A. G. B.	"	"	" "
37	C. R. W.	"	"	" "
38	P. W. C.	5, deep, irregular.	"	Slight excess of inflammation.
39	E. T.	Normal	"	Child much improved in health since date of vaccination.

No.	Name.	No. and present Condition of Cicatrices.	Result of Vaccination.	Remarks as to general Condition of Child.
40	E. P.	2, irregular	—	4 cicatrices have run into one. Child now well.
41	E. M. U.	5, normal	Good	Papular eruption after vaccination.
42	R. S.	Cannot be found.		
43	F. F.	4	Good	2 cicatrices have run into one.
44	W. L.	5, deep	"	Liable to diarrhœa.
45	A. E. S.	5, small	"	Child well.
46	B. A.	5, normal	"	"
47	E. H.	"	"	"
48	G. P.	4, very small	"	"
49	S. K.	5, normal	"	"
50	H. F. W.	5, deep	"	"

Analysis of the above table.

Number of vaccinations	50
Number examined	44
Cicatrices, normal (*70 per cent.*)	35
Erysipelas (*No. 31, case reported on.*)	1
Inflammation, serious (*No. 20.*)	1
Inflammation, moderate (*No. 40.*)	1
Inflammation, slight (*Nos. 10, 27, 29, 38, 43.*)	5
Number of children shown to be permanently injured	1
Number of children said to have improved greatly in health since the time of vaccination	2
Number of the cases in which there is said to have been an excess of inflammation	7

4 vesicles have sloughed into 1 in 2 cases. (*Nos. 20 and 40.*)

2 vesicles have sloughed into 1 in 2 cases. (*Nos. 27 and 43.*)

The cicatrices are abnormally deep in 1 case. (*No. 38.*)

The cicatrices are normal in 2 of the cases where the inflammation is said to have been more than normal. (*Nos. 10 and 29.*)

CASE 74, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of F. J. T.: report to the Commission of Dr. Theodore Dyke Acland.

F. J. T., aged four months, only child of F. T., late of ——, was vaccinated at —— on Tuesday the 23rd June 1891. He died on the 30th July 1891. The cause of death, certified by Mr. S. A. B., M.R.C.S., of —— ——, being "vaccination (31 "days); diarrhœa (3 days); collapse."

Dr. R. C. informs me that the child F. J. T. was vaccinated on the 23rd June with 17 other children from calf No. ——, and was brought back for inspection on the 8th day, the 30th June. At that date the areola was in no way excessive and no complaint had reached Dr. R. C. about any case vaccinated from the same calf.

At the time of inspection the child was wearing a vaccination shield, and the person who brought it was cautioned as to the danger of using it; whether this caution ever reached the mother I cannot be certain, but I believe it did. However this may be, the shield was not removed; for, a week later, Mr. S. A. B., who was attending another patient at Mr. T.'s house, happened to see the child F. J. T., when he noticed that he was still wearing a vaccination shield.

Mrs. T., the mother of the child F. J. T., informs me that the shield was kept clean, and that it did not produce any irritation of the vesicles.

It would, therefore, seem probable that in this instance the shield did no harm, and that the child's subsequent illness was not in any way connected with its use.

Course of illness.

From the time vaccination was performed on the 23rd June until 35 days afterwards, the 27th July, the child does not appear to have been so unwell as to make his parents think it necessary to consult a doctor.

A few days after vaccination and during the formation of the areola the child was restless and irritable, but not *ill*. (Mr. S. A. B., who happened to see the child at this time, about the 7th July, on the occasion of visiting another patient in the same house before referred to, noticed that it was not looking well.) There was no abscess or sloughing of the vaccination wounds nor excess of inflammation, and the vesicles had completely healed before the time of the child's death.

During the second week after vaccination a rash appeared on the child's body, which was treated by a chemist in —— Road.

Nothing further occurred to excite the parents' apprehension until the 27th July (35 days after vaccination). On this date the child began to suffer from diarrhœa, and passed frequent offensive green stools, containing much mucus.

Mr. S. A. B. states that he was then called in, and notwithstanding all he could do the child died on the third day of acute diarrhœa.

When Mr. S. A. B. first saw the child he did not doubt that it was suffering from ordinary acute diarrhœa. He thought that probably the attack was due to some error in diet, and he gave orders that the "Ridge's" food which the child was having should be immediately discontinued.

Change of food immediately before vaccination.

Mrs. T. had never been able to suckle her child. She had, therefore, brought it up on cow's milk, but it appears that she had changed his food a few days before the vaccination, and from that time had given him "Ridge's" food in addition to the cow's milk. From this time, that is from the time the child was vaccinated, or as it may also be said, from the time the food was changed, it seems certain that the child did not thrive well.

It is probable that any tendency to digestive disturbance would have been accentuated by the irritation of the vaccination. Again, this may possibly have been further increased by the treatment suggested by the chemist, the culminating point being reached three days before the child's death, when it began to suffer from the diarrhœa.

Conclusion.

From the evidence obtainable it would appear that vaccination ran a normal course, and that if it contributed to the child's death, it did so only in a secondary and remote degree.

There is no evidence to show that any abnormal local irritation was produced by the vaccination; and before the child became ill enough to be taken to a doctor, that is before the onset of acute illness, the wounds had entirely healed.

The child's death, without doubt, was due to an attack of acute diarrhœa; the result, probably, in part at least, of an injudicious change in its food just before vaccination was performed.

Note.—Since, in my opinion, death in this case was not due to vaccination, I have not thought it necessary to inquire into the results in the cases of the other 17 children vaccinated with the same lymph.

THEODORE DYKE ACLAND, M.D.

CASE 75, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of L. D. An inquiry was made into this case by a Medical Inspector of the Local Government Board; and an analysis of his report is given on page 71, where the case is numbered as Case CXCVIII.

CASE 76, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of M. T. An inquiry was made into this case by a Medical Inspector of the Local Government Board; and an analysis of his report is given on page 71, where the case is numbered as Case CXCVII.

CASE 77, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD

Case of E. L. An inquiry was made into this case by a Medical Inspector of the Local Government Board; and an analysis of his report is given on page 46, where the case is numbered as Case CXXXIV.

CASE 78, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of V. G. An inquiry was made into this case by a Medical Inspector of the Local Government Board; and an analysis of his report is given on page 66, where the case is numbered as Case CLXXXV.

CASE 79, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of L. A. C. An inquiry was made into this case by a Medical Inspector of the Local Government Board; and an analysis of his report is given on page 67, where the case is numbered as Case CLXXXVIII.

CASE 80, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of G. B. An inquiry was made into this case by a Medical Inspector of the Local Government Board; and an analysis of his report is given on page 72, where the case is numbered as Case CCI.

CASE 81, REPORTED TO THE COMMISSION BY MR. J. H. LYNN.

Case of E. A. R.: report to the Commission of Dr. Theodore Dyke Acland.

E. A. R., of ——, aged 5 weeks, was vaccinated on the 23rd June 1891, by Dr. R. M. W., of ——. He died on the 16th July, the certified cause of death being "erysipelas."

Father's statement. A. R., the father of the child E. A. R., tells me that he did not wish the circumstances of the case reported to the Commission. He only gave information about the child's death to those who were interested in the matter on condition that his name should not be mentioned, and that the circumstances should be kept entirely private. Upon my telling him that he was not compelled to give information if he was disinclined to do so, he assured me that it was his wish that the matter should not be further inquired into, so that as far as he is concerned I have not been able to obtain any information with regard to the child's illness.

Considering, however, the importance of ascertaining whether the lymph which was used for vaccinating the child was in any way at fault, I have thought it desirable to make inquiry into the results of vaccination on other children inoculated with the same lymph.

I ought here to acknowledge the ready help which I have in this, as in other instances, obtained from Dr. R., who supplied the lymph. On hearing of the reported injury to the child, he at once expressed his willingness to co-operate, and to assist to the best of his ability in the furtherance of any inquiry which might be necessary, and this he has accordingly done

Source of lymph. Dr. R. M. W. informs me that the child was vaccinated with lymph obtained from Dr. R. on some date immediately preceding the 22nd June. On referring to the register at ——, it was found that he had obtained one tube of lymph on the 16th June, No. ——, taken from calf No. ——. This lymph was also supplied to a large number of practitioners, and a circular has been sent out to ask for information as to the results of the vaccinations performed with it. These are given in an addendum to this report, but it may briefly be said that out of the 258 vaccinations reported, two cases only are stated to have suffered from abnormal inflammation, and in neither of these cases did any permanent injury result.

Method and course of vaccination. From information which I have received from Dr. R. M. W., there can be no reasonable doubt that every precaution was taken in vaccinating the child, and in fact, until after the eighth day the vaccination seemed to pursue a perfectly normal course. The lymph used was stored in a tube and not on a point. Only one half of it was used to vaccinate the child E. A. R., the other half was used to vaccinate some other child; who this child was is not certain, but as no report of unsatisfactory vaccination has reached Dr. R. M. W., it may reasonably be inferred that the vaccination was satisfactory. Up to the eighth day the vaccination, as has been said, pursued a normal course. Though not inflamed, the arm at this time was dressed with cold cream. The only source of irritation of the wound that I can discover is that on the eighth or ninth day after vaccination a new preparation of cold cream was applied to the vesicles, and that subsequently to this the arm began to inflame. I am told that Mrs. R., the mother of the child E. A. R., attributed the inflammation to the new ointment, and discontinued to use it in consequence; but I have not this on the parents' direct authority as Mr. R. declined to make any statement, and owing to this same cause I have been unable to pursue the investigation of this possible source of danger. It should, however, be noted that about the time that the new ointment was applied the areola was in process of formation, and the increased severity of the symptoms may have been due to excessive inflammation round the vesicles, and not to any extraneous irritants. Whatever was the cause of the inflammation, it spread rapidly, the arm became generally swollen and inflamed, and the child died 23 days after vaccination.

Conclusion. Mr. R. M. W.'s opinion is that death was due to erysipelas. It seems certainly to have been due to inflammation spreading from the vaccine vesicles; and starting during the formation of the areola. I have not been able to obtain any information which would give definite ground for suspecting any particular source of infection, and I am of opinion that no blame should attach to the vaccinator.

The results of the inquiry as to the course of vaccination in the other cases vaccinated with the same lymph lead to the conclusion that the lymph itself was not at fault; but owing to the reticence of the parents there is no evidence which would enable me to make any further statement in regard to this case.

THEODORE DYKE ACLAND, M.D.

Circular sent out asking for replies to following questions:—

Number of vaccinations?

Number of insertions in each case?

Number successful?

Whether any inflammation or suppuration?

Whether axillary or other glands enlarged?

Whether any rash or other complication?

Results of circulars sent out.

230 circulars were sent out, and 123 answers have been received.

20 report no record kept, or are too vague to be reliable.

The remaining 103 report in all 258 vaccinations.

Two cases presented abnormally severe inflammation —

(*a.*) One was complicated by enlargement and suppuration of axillary glands.

(*b.*) The other by enlargement of axillary and mammary glands, without suppuration, and with general erythematous rash.

Both subsequently did well, although in one the recovery is reported "slow."

256 were normal. These were reported as—

5 with some rash or enlargement of axillary glands.

3 with some excess of inflammation.

236 with "no inflammation" or complication of any kind.

12 cases were reported as follows:—

2, inflammation "moderate."

5, inflammation "slight."

1, "a good deal of redness round each pock."
2, "some inflammation."
2, "areola, nearly two inches in diameter."

CASE 82 REPORTED TO THE COMMISSION BY MR. J. H. LYNN.

Case of E. F.: report to the Commission of Dr. Theodore Dyke Acland.

E. F., of ——, was vaccinated by Dr. L., at the public vaccination station, ——, on the 1st July 1891. He inspected the child on the eighth day, and recorded that the vesicles were normal.

The lymph for this vaccination was taken from the arm of C. T., aged three months, of ——. I have visited this child, and found her a fine healthy-looking baby. The scars are normal, and the mother said that the child had never had a moment's disquiet since vaccination. The home is very poor, and the mother is a delicate, feeble-looking woman.

From E. F. Dr. L. vaccinated only one child, F. D. C., aged ten months, of ——, whose number in the register is 27,518. I have seen this child, he is teething and has bronchitis. He is a feeble child. Before vaccination he had a rash, but he is now (September 1891) quite well, and has no sign of eruption. The vaccination scars are normal. The home is squalid and dirty in the extreme.

E. F. is a healthy-looking child, but down to the hands on both arms there are scars of superficial ulceration which are extensive but shallow, and of a deep red colour. There is only one place on the back of the left arm where the cicatrices are not completely formed. Over this place there is some scabbing with shallow ulceration. The child has suffered from extensive impetigo, starting from the vaccination vesicles and spreading by contact to the other arm and to the arms of her sister F. G.

The starting point of this eruption seems to be clear. After the formation of the areola when the scabs were fully formed, one of them was accidentally knocked off; this occurred about the 10th day, of the exact date I am not certain, but it was *after* inspection. In order to protect the raw surface exposed by the removal of the scab, a shield was used of the ordinary kind made of wire covered with lint rag. This shield had been used for one of the other children who was vaccinated two years before, it was put by and had been in the house ever since. The rags had never been changed and were still impregnated with secretions from the vesicles of the vaccination two years previously. After a short time, it was found that this shield caused so much irritation that it had to be removed, but a great amount of irritation was set up in the wound, and the ulcers which subsequently formed down the arm were doubtless due to the inflammation which was set up at this time. The scars on the arm of the child F. G., the sister of E. F., are of a similar character and are due to direct inoculation with pus from E. F.'s arm.

In this case I believe that the evidence is clear:—

(1.) That the ulceration is not due to the vaccination, except as a secondary cause.

(2.) That it is due to the use of the shield; (*a*) which not only caused great irritation of the recent vaccination wound; (*b*) but also from its dirty condition inoculated the wound with decomposed secretions from the old wound of the previous vaccination wounds, with which it had been in contact some two years before.

There is no evidence to show that blame attaches either to the vaccinator or to the lymph used.

THEODORE DYKE ACLAND, M.D.

CASE 83, REPORTED TO THE COMMISSION BY MR. J. H. LYNN.

Case of M. M. C.: report to the Commission of Dr. Theodore Dyke Acland.

M. M. C., of ——, was vaccinated on the 7th July 1891, by Dr. L., at the public vaccination station ——. The vaccination was performed directly from the arm of B. H., of ——. I have seen B. H., and his appearance bears out the statement that he is and has been quite well. He is a typically healthy child. The vaccination cicatrices are normal.

Condition of M. M. C. arm on inspection.

M. M. C.'s arm was inspected on the 25th July by Dr. L., and neither then nor at any subsequent period did the points of inoculation present any abnormal appearance. Both parents agree with Dr. L. and with the other doctors who have seen the child in this statement. No shield was used, and no medicament was applied to the arm, the vesicles quickly scabbed over, and completely healed in three weeks.

Commencement of indisposition.

Between the time of the inspection and the time when pus was first discovered, there is a hiatus which I have not been able to fill; but according to the parents' statement, the child began to ail about two weeks after vaccination. It was not, however, until the 4th August, one month after vaccination, that the child was sufficiently ill to be taken to a doctor. She was then seen by Dr. F., Medical Officer of Health, who found that she was suffering from *pain above the right knee*. The vaccination vesicles, as has been said, were by this time completely healed; and when Dr. F. saw the child he did not even suspect that the pain in the knee was in any way connected with vaccination.

The leg above the knee was then slightly swollen, but the swelling disappeared for a time, but subsequently recurred. On the 12th August the *left arm* became affected. On this day the child was seen by Dr. F——t, who was doing Dr. F.'s work. At this time the only abnormal relic of the vaccination was an enlarged gland in the axilla, which had appeared four or five days after vaccination and had not subsided.

Dr. F——t states that he saw nothing abnormal about the vesicles, neither was there any inflammation of the arm, that "from the shoulder joint to the elbow there "was neither sloughing, eruption, induration, or "œdema, with the exception of a little transient "œdema above the elbow."

Formation of abscesses.

On the 16th August, Dr. F——t detected matter in the lower part of the left upper arm, and he opened a considerable abscess, let out the pus, and put in a drainage tube. Even at this time Dr. F——t states that there was no inflammation of the arm, and that the upper limit of the mischief was where he made the counter incision. This is considerably removed from the vaccination cicatrices. Subsequently an abscess formed in the place where the pain had been over the lower part of the right leg, and another in the lumbar region, and both of these have been opened. Since then the child has been continuously under medical treatment, and is now in —— Hospital, under the care of Dr. H., suffering from abscesses. When Dr. F. opened the abscess above the knee, he states that he found bare bone, and conjectured that it was a case of suppurative periostitis. When Dr. H. examined the case with me on the 26th September, the sinus did not seem to lead to bare bone, but to an abscess cavity on the posterior and outer side of the femur.

Present condition of child.

The child is now (September 1891) suffering from a deep-seated abscess over the lower end of the right femur which is still discharging. The right knee-joint is distended with fluid and is somewhat hotter than the left one. The wound on the back has healed, although there is a good deal of induration round the scar, and the wounds on the arm have quite healed. The child is feeble and anæmic, its condition being, doubtless, due to the protracted suffering which she has gone through in the last few weeks. During the time she has been in the hospital where careful observations have been made upon her, and previously while under the care of Dr. F——t, no febrile rise of temperature has been noted.

No abscesses formed in the axillary gland.

It is important to notice that neither at the time of the vaccination nor subsequently has the axillary gland which was irritated by the vaccination broken down, although matter has formed in other parts of the body.

Sub-vaccinees of M. M. C.

Two children, F. L. (aged four months; number in register 27,523), of ——, and F. B. (aged fifteen months; number in register 27,524) of ——, were satisfactorily vaccinated from the arm of M. M. C. on the eighth day. I have seen both these children.

F. L.'s vaccination cicatrices are normal, the child when inspected was teething and had some bronchial catarrh. She has had measles, but seemed to be well now; vaccination was deferred for a month on account of eczema, but since the vaccination she has had no return of it.

F. B. Vaccination was in this case deferred until he was 15 months old, because he had been ill with whooping-cough and there were six cases of enteric fever in the house. He was teething at the time of vaccination and subsequently the scabs were several times knocked off. The cicatrices are normal. He has eczema on the head and face, and there is some ring-

worm on the left leg and body. The house is squalid and dirty. Notwithstanding all these disadvantages the child had no inflammation round the vaccination vesicles.

Method of vaccination. No source of danger could be detected in the instrument used for vaccination, an ordinary lancet was employed, and not a scarifier; water was used as a disinfectant; the lymph was not stored, but was taken out of B. H.'s arm directly on the eighth day.

Dr. L. has for many years been Public Vaccinator at ——, and has had extended practical experience, having now vaccinated nearly 30,000 cases. The vaccination rooms have been expressly built for the purpose, and are admirably adapted for the use to which they are put. They are cleanly and in excellent order.

Sanitary condition of house. The sanitary condition of the C.'s house is on the whole good. There is no communication whatever in the house with the main drain, the closet is at the back, entirely shut off from the house, the scullery sink discharged into an open gulley which runs into a drain some yards from the back door. The position is open and airy.

Father's health. It is stated in the report forwarded to the Commission that Mr. C., the father of M. M. C., has never been ill. This is not the case. On the 20th March or thereabout, Mr. C. injured his hand, and was away from work from that date until the 26th May. The injury resulted in the formation of abscesses which discharged fetid pus both from the palm and the back of his hand. He was, according to Mrs. C.'s statement, laid up for eight weeks; the wound was offensive, and Mrs. C. states that the children were kept from him as much as possible, that all the rags, sponges, and dressings which were used for it were carefully burnt. The hand had, however, entirely healed some time, (nearly two months before the vaccination of the child was performed), and, so far as Mrs. C. knows, there is no possibility of any infection of the child M. M. C. having occurred through the use of anything which had been used to dress the father's wound. It is quite clear from inquiries which I made that great care was taken to prevent any possible danger to the children from the father's hand. The mother recognised that there was danger and took corresponding precautions.

This condition of the father's health is important for two reasons:—

(1.) It suggests that the father may have been in an unhealthy state to have suffered so severely from an injury to the hand from a piece of steel. *See note at end of report.*

(2.) It is quite possible that the worry and anxiety of her husband's illness, and the loss of wages consequent on his being out of work for eight weeks prevented Mrs. C. from giving proper nourishment to the child whom at the time she was suckling, and that it was in consequence feeble and therefore more subject to any pre-disposing cause of disease than would otherwise have been the case.

Consideration of evidence. The child M. M. C. is suffering from some septic condition resulting in deep-seated abscesses. In considering the origin of these abscesses the following points must be borne in mind:—

(1.) That the axillary gland irritated by the vaccination did not suppurate; and although the fact cannot be considered as conclusive evidence that the abscesses which were subsequently found were not due to vaccination, it is in favour of their not having been so caused.

(2.) That the vaccination vesicles at no time presented an abnormal appearance. The vaccination ran a normal course, the wounds scabbed over and healed in three weeks, and although it may perhaps be possible for a general infection to take place through a wound, without the wound itself presenting an unhealthy appearance, it is not a usual occurrence.

(3.) That first sign of active mischief was not, as might have been expected in the axillary gland, or in any part which might have been immediately affected by the vaccination wounds, but was over the right knee, *i.e.*, far removed from the point of inoculation.

(4.) That Mrs. C. states with certainty that the affection of the arm spread from the abscess *upwards* and not from the vaccination scars downwards.

(5.) That throughout the time that the child has been under medical observation, first by Dr. F—t, and second by Dr. H., at the —— Hospital, no febrile rise of temperature has been recorded; and Dr. F——t particularly states that even at the time that the child was brought to him with the abscess in the arm which he opened, *there was no inflammation of the arm*, and that the limit of the mischief was where he made the counter incision, *i.e.*, some distance below the vaccination cicatrices. (*a.*) This bears out Mrs. C.'s statement that the mischief spread from below upward, and not from above downward. (*b.*) It suggests that these abscesses were not the result of some sudden inflammatory process, but rather what are called "cold" abscesses, which are of a more chronic nature and are not unfrequently found in debilitated children.

(6.) That the course of vaccination in the two children inoculated from the arm of M. M. C. was normal; from which we may infer that the wound was healthy on the eighth day.

Conclusion. In the absence of direct evidence as to the cause of disease in the child M. M. C., it is not possible to assert positively that the abscesses are not due to the vaccination, but

(1.) There is no evidence to show that the poison was introduced either at the time of vaccination or subsequently through the vaccination wounds.

(2.) The inference of the evidence I have been able to obtain goes to negative such a supposition.

(3.) The history of the case suggests that the abscesses are rather of a chronic nature than the result of acute suppuration following upon a poisoned wound.

Note. Since writing this report I have received the following letter from Mr. C., the father of M. M. C. The spike to which he alludes, and the condition of the hand at the time of the injury, seems quite sufficient to account for the suppuration which took place; without necessarily supposing that he had previously been in a bad state of health:—

DEAR SIR, October 10th, 1891.

MY book to hand for which I thank you. My wife told me you wished to know particulars about my hand which are as follows:—

On Friday, March 20th, 1891, I struck the enclosed peg to flatten one end when it shot off the block into my left hand causing great pain and total disablement. It left no mark except a spot of blood, the size of a pin's head where it went in. I went to Dr. —— next day, when he advised me to bathe it well. I saw him again on Monday. On Tuesday (March 24th), he lanced it but could not find the peg. On Thursday 26th, he ordered linseed poultices, and the peg came out on Saturday 28th, having been in eight days. My hand continued to get worse, but finally healed, and I started work again on Tuesday, May 12th. It stopped discharging a fortnight or more before I began work. At the time of the accident my hand was covered with rust and grease, brass and steel filings, which, I think, must have got in and poisoned the blood. Owing to the pain I could not bear the children near me for fear they should knock my hand. I kept a sponge and basin solely for my use, which were destroyed, and being my left hand I did most of the bandaging and bathing myself.

You will greatly oblige by returning the peg, and if convenient will you kindly give me the result of your investigation. I am sorry to say my child still keeps about the same and does not show any signs of improvement. She is very comfortable and her nurse says very contented and very quiet.

I remain, &c.

S. C.

P.S.—I never had occasion to visit a doctor for advice all my life until my accident.

Dr. Acland.

Addenda. The child M. M. C. has been re-admitted to the —— Hospital on two occasions during the last (February 1894) 18 months, and Dr. H. has removed a piece of necrosed bone from the lower end of the right femur, and a small piece has subsequently come away spontaneously. There are now two deep puckered cicatrices on the outer side of the lower end of the right femur. There are two scars on the left fore-arm, and a minute inflammatory thickening at one point. The vaccination scars are almost invisible. The child's abdomen is prominent; the ribs are beaded; the epiphysis of the long bones large; the forehead prominent. She is liable to attacks of diarrhœa and sweats much at night. There is no enlargement of the abdominal viscera. The skin is clear. The child is suffering from well-marked rickets, but does not show any signs of syphilis.

THEODORE DYKE ACLAND, M.D.

CASE 84, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of N. H. An inquiry was made into this case by a Medical Inspector of the Local Government Board; and an analysis of his report is given on page 70, where the case is numbered as Case CXCV.

CASE 85, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of C. A. M. An inquiry was made into this case by a Medical Inspector of the Local Government Board; and an analysis of his report is given on page 69, where the case is numbered as Case CXCIII.

CASE 86, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of S. S.: report to the Commission of Dr. Theodore Dyke Acland.

S. S., aged four months, was vaccinated on Thursday, the 19th August, 1891, by Dr. F., of ——. She died four weeks afterwards of cellulitis and abscesses originating from the vaccine vesicles, the cause of death being certified by Dr. J. R., of —— ——, as "vaccination, 28 days; "erysipelas, 13 days."

The lymph used was fresh calf lymph obtained from Messrs. C. and A., of ——, who inform me they believe that Dr. F. obtained the lymph on the 18th August, but that they have no entry in their books to this effect. Assuming, however, that the day is correct, the lymph was received from Dr. R. on the 15th August, and was therefore fresh when used. The satisfactory result of the other vaccinations done from the same lymph, together with want of *certainty* as to the date on which the lymph was procured, seem to make it unnecessary and useless to attempt to follow this line of inquiry further.

The lymph thus obtained was used at once for the vaccination of five children, S. S., and the four whose names are given below:—

1. J. W., aged five months, a typically healthy baby with clear skin. Vaccination was followed by no rash, inflammation, or induration of glands. There is one small healthy cicatrix.
2. E. M., aged four and three-quarter months. Vaccination was followed by no rash or inflammation. There are two healthy cicatrices, and the child is in good sound health.
3. E. H., aged five months. A large healthy child. Vaccination was followed by no inflammation, rash, or enlargements of glands. There are two healthy cicatrices.
4. M.G., a fine healthy infant with clear skin. There are two normal cicatrices. There has been no abnormal inflammation, and no rash. The scabs dropped off three weeks after vaccination.

It will be seen from the above that in all the cases vaccinated with the same lymph at the same time as S. S., vaccination ran a normal course, and that the health of none of the children seems to have suffered in any way, and that in no case were there any secondary phenomena, such as cutaneous eruptions, indurated glands, or abscesses.

Mrs. S., the mother of the child S. S., states that she did not suspect that anything was wrong until the 14th day after vaccination, and her statement is corroborated by Dr. F., who, when he saw the child's arm on the 8th day, the 26th August, considered that the vaccination was running a normal course. When he inspected the child he did not open the vesicles. He spoke very seriously to the mother about a shield which was on the infant's arm.

Mrs. S. tells me that the shield was one which had been used for another of her children nearly three years ago, that it was unquestionably dirty, and that the rags covering the wires had not been cleaned or changed since it was first used. She does not think that there was any inflammation of the first child's arm, and, as far as she could remember, the scabs had not been knocked off. She does not know that the scabs on the child S. S.'s arm were irritated by the shield, but she was so much impressed by what Dr. F. said, that she burned it immediately after her return home.

For six days all seemed to be going well, the child was not more irritable than children often are during the formation of the areola, and it was not until the night of Wednesday, the 1st September, that she noticed any abnormal inflammation. After its commencement the inflammation spread very rapidly, and by next morning, Thursday, the 2nd September, reached from shoulder to wrist. On the same day an abscess began to form in the axilla, which subsequently ruptured.

The inflamed arm was dusted with creolin and flour, and on Monday, the 5th September, the scabs having become partially detached, they were removed by Dr. F. He says that he considered the ulcers to be healthy, and covered only with healthy granulations. There was no sloughing round or extension of the vesicles. By Thursday the 8th September, the inflammation had extended to the right arm, where an abscess formed over the biceps which was opened by Dr. J. R., under whose care the child had been placed. He used such remedies as seemed to be most appropriate, but the child became exhausted and died on the 16th September, 14 days after the inflammation commenced.

Cause of inflammation.

It cannot be doubted that the dirty shield which was used constituted a serious source of danger, and might well have been the cause of the subsequent mischief, as indeed it was supposed to have been both by mother and doctor.

There are, however, grounds for doubting whether this was the case. In the first instance no irritation of the wounds was noticed while it was in use; secondly, it had been discarded a week before the inflammation commenced; and lastly, the vaccination vesicles themselves did not slough; although there can be no doubt that they were the channel through which the infection took place.

There was however, another possible origin of the cellulitis. Some two or three weeks before vaccination the child contracted purulent ophthalmia from her eldest sister who had suffered severely from it. This child, H., aged four, had had copious purulent discharge from the eyes, and the discharge was still continuing when her sister S. S. was vaccinated, and many neighbours' children were at this time also suffering in the same way. The child S. S. had been taken into the country for a holiday, and was so well when brought for vaccination that there seemed no sufficient reason for deferring it.

Mrs. S. seems to have taken very reasonable precautions. She wiped the child's eyes with pieces of rag which she immediately afterwards threw into the fire, but she did not think of washing her hands after so doing, and did not give a thought to the possibility of inoculating her baby's arm with pus from the other child's eyes.

Conclusion.

The consideration of the above evidence leads to the conclusion:—

1. That there was no inherent fault in the lymph itself; as the vaccination of the other children inoculated with it at the same time in each case was satisfactory and produced no abnormal results.
2. That the inflammation was probably not due to accidental contamination of the lymph or wound at the time of vaccination, since the inflammation did not make its appearance until the 14th day after vaccination.
3. That there were two obvious sources of danger, and that either of these were in themselves sufficient to cause a fatal result; (*a.*) the use of the dirty shield, and (*b.*) the prevalence at the time of ophthalmia with profuse purulent discharges.

The first of these, the use of the shield covered with dirty rags, may, as I think, in this case be reasonably set aside, as the inflammation did not begin until one week after the use of the shield had been discontinued.

It may be that the suppuration which occurred was due to the second of these causes, viz., the presence of purulent ophthalmia from which the child herself had

suffered, and from which her sister, together with many other children in the neighbourhood, were suffering at the time of the vaccination.

THEODORE DYKE ACLAND, M.D.

CASE 87, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.*

Case of J. W. An inquiry was made into this case by a Medical Inspector of the Local Government Board. The following is an abstract of his report:

Local registrar's register contains entry of death on the 18th September 1891 of J. W., aged three months, certified by Dr. F. as from "Erysipelatous "erythema, the result of vaccination, 12 days; acute "œdematous laryngitis, 16 hours." Mr. Thompson was directed to investigate this case, and reports to the following effect:—

Enquiry was made on December 21st and 22nd, 1891. Dr. J., Public Vaccinator, stated that the deceased child was vaccinated on August 13th 1891, as a private patient, at his surgery. Although the child was certified as having been vaccinated by himself, she was, he says, in reality vaccinated by his late assistant, Mr. B., who has since left the neighbourhood. He (Dr. J.) was, he states, away for his holiday at the time, and when after his return he inquired into the case he was astonished to find that his name had been affixed to the certificate. This he expresses himself as being much annoyed at, for, he states, when he is at home he invariably vaccinates all children himself, whether in public or private practice, and is careful to avoid any irregularity occurring.

As regards the vaccination of the deceased child W., he says that Mr. B. informed him it was done arm to arm from a child named Wr., and that two other children, named S. and R., were vaccinated at the same time and with the same lymph. He himself never saw the deceased child W. either in connexion with her vaccination or subsequent illness. The vaccinifer, Wr., he further states, was one of two children (private patients) vaccinated by himself on August 6th. Wr.'s vaccination did perfectly well, and the child remained in good health until about the middle of September, when it was attacked with acute diarrhœa of which it died. For this illness Wr. was attended mainly by Mr. C. (Dr. J.'s partner), but Dr. J. himself visited the child upon one or more occasions, and is therefore in a position to state that its vaccination had done perfectly well. This child Wr. was a nurse-child from London in the care of some persons named C., who have since, he says, left the neighbourhood.

Mr. C. (Dr. J.'s partner) informed Mr. Thompson that he attended the child Wr. (vaccinifer to the child J. W.) for an attack of diarrhœa of a kind then prevalent in the neighbourhood, and which he regarded as the so-called summer diarrhœa. It was characterised by sudden onset, copious watery stools, and collapse. He does not for a moment imagine that vaccination had anything to do with this child's diarrhœa or death, and he concludes that the vaccination had healed naturally, as no mention of it was made to him by the persons having charge of the child, and, in fact, he did not know that the child had been vaccinated at all. Mr. Thompson saw a copy of this child's (V. M. Wr.) death certificate, which showed that the death had been certified by Mr. C. as having occurred on September 28th, 1891, from "diarrhœa."

Mr. Thompson subsequently visited Wr.'s home, and found, as stated by Dr. J., that the persons who had had charge of this child had since left that neighbourhood, and Mr. Thompson was unable to find them.

He succeeded in seeing the other child (Rs.) stated to have been vaccinated by Dr. J. on August 6th along with Wr. (though whether or not with the same lymph Dr. J. is unable to say), and he also saw the two children (S. and R.) said to have been vaccinated by Mr. B. on August 13th along with the deceased child J. W., and with the same lymph, *i.e.*, arm-to-arm from the child Wr., also since deceased. All these children had apparently done perfectly well. They had each been vaccinated with two insertions, and each had two normal vaccination scars. In no instance had there (according to the mothers) been any rupture of vesicles before the eighth day, or at any time any undue areola. The children were all stated to have been well while passing through their vaccination and to have continued well since.

Mrs. S. and Mrs. R., the mothers of the reputed co-vaccinees of the deceased child J. W., each, however, voluntarily made statements with respect to the course of J. W.'s vaccination which it is important should be recorded. Mrs. R. said that she remembered when the children were taken for inspection on the eighth day that the deceased child W.'s vesicles were inflamed, and that Mr. B. said, as a consequence of this, he would not vaccinate any children from them. He also said they must have been rubbed, and he found fault with the child having a bright red dyed dress and red ribbon in contact with the vesicles. Mrs. S. also said she remembered the deceased child's vesicles being inflamed on the eighth day, and that the child had a bright red dress and red ribbon, and that "the dress seemed to rub the arm." Mr. B., she says, found fault, upon this account, with the nurse who brought the child.

As regards the deceased child J. W., the subject of this inquiry, Mrs. W., the mother, stated that she was a perfectly healthy child until she was vaccinated. She was vaccinated on a Thursday in August 1891, as a private patient, at Dr. J.'s surgery. A Mrs. B., a neighbour, took the child to be vaccinated, and also, on the eighth day, to be inspected. Two insertions were made and both took. About the third or fourth day they became somewhat inflamed, and by the eighth day there was a ring of inflammation about three-quarters of an inch wide around the lower vesicle, and somewhat less around the upper one. Near the lower vesicle there were at this time two or three "little white blisters." The vesicles had not burst, but they were pricked by the doctor at the inspection. The inflammation did not increase during the second week, and at the end of this week the places scabbed over, but matter kept coming

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* *The Commission examined two witnesses as to this case, the medical man whose assistant vaccinated the child in question and the medical man who attended the child in her subsequent illness. See minutes of evidence of Dr. Thomas Mason Johnson and Mr. Robert Forsyth, appended to the Commission's Sixth Report, Questions 18,353-82. Before the examination of these gentlemen as witnesses the Commission had received from them the following letters:—*

(From Dr. Johnson.)

251, Chapel Street, Salford,
October 22, 1891.

Dear Sir,

In reply to your letter of October 19, respecting the child J. W., I have much pleasure in giving you all the information in my power. She was vaccinated at my surgery on the 13th of August, two other children being operated on at the same time from the same lymph. I can give no explanation as to the cause of the erysipelatous inflammation, for the child was not brought to me; but I would observe that it was a delicate child, whose mother is phthisical. The parents live in a small beer-house, which is frequently much crowded, and I believe (from hearsay) that the child was taken a great deal from house to house during the week the vesicles were rising. The other two children who were vaccinated from the same lymph did well, the vesicles pursuing the usual course, and they are both well at the present time.

I remain, &c.
Thos. M. Johnson.

Bret Ince, Esq.

(From Mr. Forsyth.)

227, Oldfield Road, Salford,
October 8, 1891.

Dear Sir,

Yours of the 1st October to hand. J. W., of ———, was vaccinated on 13th August. From the third day the points of inoculation were angry and inflammatory in appearance. On the eighth day the fluid in the vesicles was so turbid that the doctor did not see his way to take any vaccine from them.

From this time the two sores kept continually secreting pus, the surrounding skin being still red and irritable. The child's health also deteriorated, and she suffered much from vomiting.

On September 5th the child had a convulsion, and on the following day she came under my notice for the first time. On that day the sores were still secreting pus, although the amount discharged was lessening. The surrounding skin had the appearance of being recently congested. On one side of the margin of the lower pock was a circumscribed area of bright redness about the size of a shilling. The child's temperature was 101°. The next day the spot had greatly increased in area, having surrounded the arm as low as the elbow joint. On the following day it had reached the shoulder joint, and, crossing over the upper part of the chest, began to invade the right arm.

Day by day the redness, accompanied with swelling, and in some places with considerable œdema, continued to spread until the 10th September, when it had successively invaded the entire length of both arms and hands, including the tips of the fingers, the back and front of the chest, the abdomen, and the legs as far as the toe-nails in one and the ankle joint in the other.

The parts previously attacked were at this time beginning to return to their normal condition.

On the morning of the 11th the redness spread upward from the neck to the face and back of the head. On the same evening it had surrounded the mouth, and shortly after symptoms of laryngeal obstruction supervened, and, after continuing for some hours, proved fatal.

I am given to understand that human lymph was used, and that at least one other was vaccinated on the same day from the same child. Should you require any particulars omitted, I shall be glad to supply now.

Faithfully yours,
Robert Forsyth.

Bret Ince, Esq.

from under the scabs. In a day or two the lower scab came off and a fresh one formed. No further change occurred in the condition of the arm until the day they took the child to Dr. F.'s surgery (according to Dr. F., September 6th or the 25th day of vaccination). On the previous day the child had had a fit and it was on this account they took her to Dr. F. But when undressing her at Dr. F.'s they found a red swelling of the skin about the size of an egg, just below the lower pock. During the next day or two this redness spread down the arm to the wrist, then across the chest, down the other arm, stomach, back and legs, and lastly to the lower part of the face. Then the child's breathing became bad and she died. Dr. F. attended her till she died. Nothing was applied to the arm, Mrs. W. says, except some whisky and water ordered by Mr. B., and no shield was used. The child, however, wore a red merino frock which had never been washed, and the sleeve was tied up with pink silk ribbon.

Mrs. W., Mr. Thompson found to be a delicate looking woman and at the time of his visit she was suffering from a cough. The deceased was her first child and she has had no miscarriages she says. Her father died at the age of 37 from "heart disease," and she has lost one sister in a confinement, but her mother and other sisters are stated to be alive and healthy. Her husband looks healthy and his family history is apparently good.

There had been no infectious illness in the house, Mrs. W. said, or as far as she knew in the neighbourhood, about the time of the child's vaccination and subsequent erysipelas. The child, she also said, was taken nowhere after its vaccination except to the house of the neighbour, Mrs. B. (Mrs. B. stated afterwards that there had been no illness at her house) and to Dr. F.'s. They had had no visitors who would have been likely to have brought infection, but the house being a public-house such persons might of course have come there without her knowing it, and she certainly sometimes took the child with her into the bar.

At the time of Mr. Thompson's visit the house was dirty and untidy. There had, Mrs. W. said, been nuisance from a privy in the yard, but this privy had been converted into a watercloset and the nuisance abated before the child was born. Mr. Thompson found this watercloset to be a hopper, fitted with a water-waste preventer which was in working order. The closet was free from nuisance. About the time of the child's illness some men were repairing a slop-water drain in an open air passage between the yards of the row of houses in which the Ws. live and the row behind, but Mrs. W. does not remember any nuisance from this cause.

Mrs. B., a neighbour of Mrs. W., informed Mr. Thompson that she took the deceased child J. W. to be vaccinated at Dr. J.'s surgery. The child was vaccinated by Mr. B., and she did not see Dr. J. there. The vaccination was arm-to-arm from a child she heard had been born in London, but she does not remember the name of the child. She also took J. W. to be inspected on the eighth day. Mr. B. pricked the vesicles but did not use any lymph from them as he said the arm was inflamed. He told her to take off the child's red frock as it might poison the vaccination places. Mrs. B. who was present when Mrs. W. made her statement, said she had nothing to add to it with regard to the condition of the child's arm at the time of inspection and afterwards, as Mrs. W.'s account was correct.

Dr. F. stated that the deceased child was brought to his surgery on September 6th (the 25th day of vaccination), and he was then told that the child had had a convulsion on the previous day. He was also told that the child had been vaccinated on August 13th and that the pocks had run the usual course for the first few days. When he first saw the child (September 6th) there was the appearance of a good deal of recent congestion in the immediate neighbourhood of the two pocks, and the body temperature was 101° or 102°. The sores were deep, secreting a good deal of pus; had an angry look; and no appearance of healing. There were scabs on them, but pus was exuding from under the edges of these scabs. On one side of the lower pock there was an erythematous blush about the size of a shilling. Day by day this blush extended, ultimately invading the whole body except the upper part of the face. Thirty-six hours before death the child suffered from laboured breathing and on examination he found the whole throat œdematous. He has no doubt the child died of œdema of the glottis. Mr. B. (who Mr. Thompson understands is not yet qualified) replies to Mr. Thompson's questions addressed to him by letter that he vaccinated the deceased child J. W. in August. He vaccinated her, he says, with "lymph from a "healthy child," and also, he believes, vaccinated the two children S. and R. from the same child. He used an ordinary lancet, which he keeps exclusively for vaccination, both for the vaccination of W. and for opening her vesicles on the eighth day. He always cleansed this lancet "with a towel between the vacci-"nation of one child and the next." As far as he can remember, he was not attending any case of erysipelas, septic or other infectious disease at the time of the vaccination or between that time and the inspection, and he does not think there could have been any source of infection about himself or his clothes. He expressed himself as unable to account for the erysipelas and does not appear to remember the circumstance of the child wearing a red frock. He describes the condition of the arm as normal on the eighth day.

Mr. Thompson adds that he should have mentioned that Dr. J., after consulting his books, also stated that they were not attending any cases of erysipelas or septic disease, or scarlet fever, about the time of W.'s vaccination or inspection. The surgery in which the vaccination was performed Mr. Thompson found clean, airy, and apparently wholesome.

Very little erysipelas was, Mr. Thompson reports, notified in the borough during the months of August and September 1891. Indeed between the first of August and the date of this child's death only three cases of erysipelas were notified in the whole borough, and all these were a considerable distance from deceased's home. Neither does there seem to have been any scarlet fever in the neighbourhood.

Case 88, reported to the Commission by Mr. J. H. Lynn.

Case of M. H.: report to the Commission of Dr. Theodore Dyke Acland.

M. H., of ——, was born on the 12th May 1891, and was vaccinated on the 18th August by Dr. R., Public Vaccinator for the fifth district of —— Union, acting for Dr. P., Public Vaccinator at ——, who was away.

Dr. R. states that on the eighth day, when he inspected the child M. H., he did not notice anything abnormal, and there is no record in the books at the vaccination station that there was an unusual amount of inflammation.

Mrs. H., the mother of the child M. H., however, appears not to have been satisfied, and she states that she went straight from the vaccination station in ——, to a dispensary kept in ——, by Dr. S., of ——, under the name of the —— Dispensary.

Condition of arm. The child was attended there, but not by Dr. S., who, neither then, nor subsequently, saw the child. There is no record to show what the condition of the arm was. This can only be indirectly inferred from the notes of treatment kept by the dispenser. Lead lotion was ordered to be applied, and the mother poulticed the arm.

Formation of abscesses. On the day next to that on which the child was inspected the arm began to swell, and the swelling extended down to the hand. The inflammation spread directly from the vesicles during the formation of the areola; the axillary glands became involved and suppurated, and subsequently other abscesses formed in the affected arm.

As the case was not progressing favourably, the child was taken to St. Thomas's Hospital, on Thursday the 24th September, and is now being treated there by Mr. Ford, house surgeon, under the direction of Mr. Makins.

When I first saw the child one large abscess had been opened over the front of the forearm, and one in the axilla, there was one unopened over the lower part of the upper arm and another over the base of the little finger. Since then the abscess over the lower end of the upper arm and that over the base of the little finger have been opened.

Condition of child, September 29th. The child is in a very feeble condition, she is considerably emaciated, and is very anæmic but is taking food fairly well, and has no diarrhœa. She has four vaccination scars which did not present any very noticeable abnormal appearance at the time that I saw the child.

Condition October 22nd. The child is doing well, the abscesses have all closed, and the wounds are healed; the child is in a much better condition than when seen first.

Consideration as to cause of abscesses. With regard to the cause of these abscesses no evidence has been obtained to show that the vaccination was performed otherwise than with ordinary care.

No application was made to the wounds, they were not wiped, and no shield was used.

Vaccinifer. The child M. H. was vaccinated directly from the arm of J. M., of ——, who has been seen. At the time when the lymph was taken from his arm the vesicles appeared to be normal, but the mother states that the arm subsequently inflamed, the inflammation extending round the back and to the other arm and down to the elbow. She says that the inflammation lasted for a month, but that the child was not ill enough to be taken to a doctor, and that it is now quite well. The cicatrices are normal, and there is no scarring or other sign of inflammation in the back.

Condition of child's home. The child M.H.'s home is extremely poor and very dirty. The kitchen sink is untrapped and opens directly into the room, but there is no offensive smell from it. The closet is unlighted and unventilated, except by an aperture made by the removal of a brick, but the flushing apparatus seems to be in good order.

Condition of child before vaccination. It is impossible to say what the condition of the child before vaccination was. It is said to have been the healthiest of twins, who were born on the 12th May. It now is ill and in much worse condition than the other child, who, however, is a large, flabby, anæmic infant, certainly not robust, and I should think little able to withstand any severe inflammatory affection.

Conclusion. From the evidence given above it may be concluded that the abscesses are the direct result of inflammation round the vaccine vesicles.

The fact cannot be disregarded that, according to the statement of the child J .M.'s mother, the vaccination in the child from whom the lymph was taken did not subsequently run a normal course. There is, however, no expert evidence that this was the case, and the probable condition of the child itself, judging from the other twin, and the condition of its surroundings are in my opinion such as would give rise to considerable risk at the time of vaccination.

dum. On the 24th November 1891, the abscesses had all healed. The child was feeble and rather emaciated, but had greatly improved in health since last seen.

THEODORE DYKE ACLAND, M.D.

CASE 89, REPORTED TO THE COMMISSION BY THE SECRETARY FOR SCOTLAND.

Case of J. N. W.: report to the Commission of Dr. Sidney Coupland.

In the inquiry which I made at —— on the 23rd, 24th, and 29th March, 1893, I endeavoured to ascertain the facts concerning the state of health of J. N. W. between the date of his vaccination in July 1887, and that of his admission into the —— Hospital on the 15th February, 1889. With this object I called (1) upon Mrs. W., the mother of the child, at ——, whither she had moved from ——about a year ago; (2) upon Dr. G. F., of—— (formerly of ——), who attended the child until its admission into hospital, and (3) upon Dr. S., of ——, who vaccinated the child, and who certified to the vaccination being successful on the 27th July 1887. (Appended to this report are copies of two letters received by the Commission from Dr. S. and of a note relating to the case on and after the 15th February 1889, from the note book of the —— Hospital, forwarded by Dr. R. J. G.).

The result of my inquiry has not been altogether satisfactory, especially as regards the first six months after the vaccination, the statements made by the mother and by the medical men being irreconcilable.

It may conduce to clearness if I relate the history of the case in the order of my inquiries.

Mother's account of case. My first visit to Mrs. W. was made on the 23rd March. She is a young, healthy-looking woman, never having been ill since her childhood, when she was laid up with "gastric fever." She was aware that some application had been made with respect to her child's illness being connected with vaccination, but she had not heard anything of the result, and did not quite understand the purpose of my visit. She was perfectly candid in her replies to my questions, and gave a coherent account of the boy's illness, which she stated had commenced within a month of vaccination. She further said that the idea that the illness was due to vaccination was entertained at the time by Dr. F., and even more strongly by Dr. M. M. (since deceased), who also attended the child prior to its admission into hospital.

At my second visit to Mrs. W. on the 29th March, after I had seen Drs. F. and S., she repeated the above statements, and further informed me that the child's jaw began to swell "just after" it had been vaccinated, that Dr. F. was then called in, and continued attending for more than 12 months, when Dr. M. replaced him. By this time the disease in the jaw was far advanced, and some dead bone was removed by Dr. M. before the child went into hospital in February 1889. [This is consistent with its comparatively short stay in hospital on this occasion—18 days.] After his discharge from the hospital, and between that date and his re-admission in August, i.e., a period of five months, Dr. F. seems to have resumed his attendance, for Mrs. W. said that the arm became affected, and Dr. F. probed it under chloroform. [On this his second stay in hospital, 7th August to 11th September, the arm was amputated.]

Account by medical man in attendance. Dr. F. told me that to the best of his belief he did not begin to attend J. N. W. until six months after he had been vaccinated, nor did he remember that there was anything then the matter with the arm on which vaccination had been performed. He keeps no records of his cases, but he recalled the extremely reduced state of the infant and the severity of its illness, which commenced in the necrosis of the lower jaw, and later of the humerus. He did not think the child could survive. He was in doubt as to the origin of the disease, half suspecting syphilis, but having no collateral evidence of this. Certainly, he said, he could not satisfy himself that vaccination had anything to do with it; had he thought so he would have felt bound to communicate his view to Dr. S., who had vaccinated the child.

Vaccinator's statement. Dr. S. told me that he was called in on one occasion to attend the family about six months after the child had been vaccinated. Up to that time he said the child had not been ill, and I gathered also that no complaint had been made to him as to the vaccination.

It is impossible to reconcile these statements, although Mrs. W. said that she could recall to Dr. F.'s mind that he did attend within a month of the vaccination. On the other hand Dr. F.'s recollection of the date of his first attendance corresponds with that of Dr. S., who has a record of his visit to the W.'s on the 14th April 1888. [See his letter of the 30th November 1892.]

I may remark in passing that had the parents been convinced that vaccination was at fault they would hardly have been likely to have called in Dr. S. six months afterwards. Indeed Mrs. W. told me that when her husband and herself were told that vaccination was responsible for the illness, they "blamed Dr. S." and ceased having him to attend.

Further statement by mother as to the vaccinifer. [Nevertheless, after her husband's death, Mrs. W. applied to Dr. S. for assistance in procuring her a lodger.]

In further corroboration of her statement that the child's disease was caused by vaccination, Mrs. W. told me that a month after it was vaccinated the "arm "swelled up, and the pocks turned black." She also said that the mother of the child from whose arm J. N. W. was vaccinated told her at the time that her child was 15 months old and had had its vaccination postponed because of ill-health. It is unfortunate that this woman is a stranger to Mrs. W., who has never seen her since that day when they sat together in the waiting room. Mrs. W. further said that J. N. W.'s arm was not inspected by Dr. S. until the 15th day, when the spots were already "black," for he, Dr. S., was not at home when she brought the child to his surgery for inspection a week after vaccination.

Family history. I had also the opportunity of seeing both the W. children and of learning particulars of the family history. The parents, who both came from the neighbourhood of ——, had, prior to marriage, enjoyed good health. On neither side is there any history of tubercular taint. The father was a plumber by occupation, and died five years ago at the age of 28 from an attack of "inflammation of the bowels" after five days' illness, during which he was attended by Dr. M. M. There were two children, J. C. W., now 8 years of age, and J. N. W., 6 years.

J. C. W. had measles 18 months ago, followed by swelling of the cervical and submaxillary lymphatic glands. Some of the latter suppurated and discharged spontaneously. His mother says he was the more delicate of the two, but he looks now fairly robust, has a good colour, clear fair skin; he is thinner than

his brother, who does not go to school as he does. There is a recent irregular cicatrix about 1½ inch long beneath the jaw on the right side, and some enlarged glands can be felt in the neighbourhood.

J. N. W., born on the 25th January 1887, breast-fed, and "a fine infant," is now well nourished and rosy cheeked, but bears evidence of the severe disease from which he suffered in infancy. There is a marked internal strabismus and eversion of the left lower eyelid from ectropion. The face is much deformed with extreme recession of the chin, the lower jaw being represented by a thin shell of bone. There is a cicatrix at the angle of the jaw. The right arm has been amputated in the middle third; and just above the extremity of the stump can be seen two well-marked vaccination scars, about half-inch area. There is no deep puckering as if ulceration had occurred in their vicinity. Over the left malleolus there is a scar; and also one in the left groin, where there have apparently been some suppurating glands.

My own impression of the case is that there is no proof that the extensive bone disease was due to vaccination. The discrepancy in the record and the inability to trace the vaccinifer or co-vaccinees of J. N. W. unfortunately prevents the obtaining of evidence in support of or in contradiction to the allegation. The fact that the elder child has since suffered from glandular inflammation may, however, be fairly deemed to be suggestive of a family strumous taint, whilst the record which Dr. S. has of his visit to the family in April 1888 seems to postpone the onset of the strumous manifestations in the case of J. N. W. to a period too remote from that of the vaccination to be related to it. But, as before said, I am unable to reconcile this with the mother's categorical statement as to the date of commencement of the infant's illness.

SIDNEY COUPLAND, M.D.

(Copy of letters from Dr. S.)

Re W.'s child.

DEAR SIR, 15th December 1891.

REFERRING to your communication of 11th inst. regarding the vaccination of J. N. W., of ———, I beg to state that to the best of my knowledge and belief the lymph used to vaccinate the child was pure lymph taken from a healthy child from characteristic vaccination vesicles, and transferred from arm to arm on the seventh day after operation. I vaccinated at that time (1887) every Wednesday at 3 p.m., and have ascertained from the registrar and my own visiting book the children vaccinated by me during the month of July 1887; but which particular child I vaccinated Mrs. W.'s child from, I could not at this distant date venture to state. But this I know, that there were no complaints from any other mother whose child had been vaccinated during the same month nor during the year.

I only vaccinate from children whose parents' family history I know intimately, never using lymph from any stranger child that may come to my vaccinations.

I had upwards of 150 children in my own practice to be vaccinated that year besides outsiders (these are children at whose birth I was not present), and I keep no record from whose child lymph is taken and upon whose child it is vaccinated.

The parents of the child W. do not belong to this district, so I have had no opportunity of ascertaining their previous history, nor what diseases they may have suffered from.

The father, the registrar tells me, died of enteritis, after six days' illness, in 1888, and that is the extent of my knowledge of the family history.

The history of the case after admission to the ——— hospital is the ordinary history of a case of bone disease going on to necrosis and requiring the usual treatment, but there is nothing to show that the case has a specific history, nor mention of any specific treatment, and even if it were so, there is no proof why vaccination should be pitched upon as the cause of the taint here, when the others were free. If there is any other point I can throw any light upon I shall be pleased, and consider it a duty to communicate it to you.

I am, &c.

To Bret Ince, Esq. J. G. S.

Royal Commission on Vaccination.

DEAR SIR, 30th November 1892.

I WAS the only medical attendant of the family W., of ———, until April 1888. I was called on the 14th of that month to the child who had had a convulsion, but was better before my arrival.

Subsequent to that I know from Mrs. W. herself that she had been consulting Dr. M. M. (now deceased), between 1889 and my former attendance in 1888.

Knowing that her husband was dead, and she having applied to me for lodgers, I sent her an "in-lying" case, who stayed some months and I was last there in July 1889.

I am, &c.

Bret Ince, Esq. J. G. S.

(Copy of a note as to the case from the note-book of the ——— Hospital forwarded by Dr. R. J. G.)

——— Hospital. Dr. G.'s ward.

Case of J. N. W., aged 2 years.

Admissions.	Date.	——
I.	1889. February 15th -	Admitted for disease of lower jaw and necrosis of malar bone.
	March 5th - -	Discharged improved.
II.	1889. August 7th -	Large suppurating wound over right elbow.
	„ 22nd -	Chloroform examination. Bone much necrosed. Arm amputated below the shoulder.
	September 7th -	Stump quite healed.
	„ 11th -	Discharged cured.
III.	October 19th -	Re-admitted. Os calcis scraped and abscess on *right* (*?*) eyelid opened.
	December 28th -	Discharged cured.
IV.	1890. September 15th -	Ectropion. Lower left eyelid. T incision sutured, &c.
	1890. October 9th - -	Discharged improved.
V.	1891. May 8th -	Re-admitted. Abscesses in face and groin opened and scraped, under chloroform.
	June 19th - -	Discharged improved.

CASE 90, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of C. W. H. L. An inquiry was made into this case by a Medical Inspector of the Local Government Board; and an analysis of his report is given on page 73, where the case is numbered as Case CCII.

CASE 91, REPORTED TO THE COMMISSION BY MR. J. H. LYNN.

Case of W. B.: report to the Commission of Dr. Theodore Dyke Acland.

W. B., formerly of ——, whose father now lives at ——, was vaccinated when 11½ weeks old, on the 27th August 1891, by Dr. R. P. W., of —— He died on the 8th September, the certificate of death being "croup; "convulsions."

Dr. R. P. W. informs me that he vaccinated in two places, and that when the child was brought to him on the eighth day, he did not notice that there was anything unusual in the appearance of the vesicles. Vaccination was performed not with a lancet but with a scarifier, which was not disinfected but was cleaned by having its points thrust through a handkerchief. The vesicles were opened with a lancet; the lancet is used specially for that purpose; but at the time when the vesicles were opened, it was not subjected to any special disinfection. Dr. R. P. W. is inclined to attach less importance to the evidence of inflammation round the vesicles than the parents. He says that it is quite true that there was a blush round the wound which extended to the wrist and shoulder with some swelling of the hand, but he says that the rash subsided and entirely disappeared before the child's death. The vesicles themselves did not slough, the scabs only became depressed. Judging from the hoarseness of the child's cry, he states that it is his belief that some laryngeal affection was super-

added to the symptoms resulting from the abnormal course of the vaccination. Since seeing Dr. R. P. W. I have received a letter from him from which the following is a quotation :—"I saw it (the child W. B.) " on the Saturday afternoon (September 5th), and pre- " scribed local treatment for the arm to reduce the " swelling and inflammatory mischief. On Sunday my " attention was drawn to the condition of the throat " by the parents. They evidently considered it serious, " as they were using external applications to it, and at " the time I felt so impressed with the importance of " this symptom that I said I should see the child again " in the evening. That night I found the child's " throat worse, and used all the most appropriate " remedies I am in the habit of applying in cases of " croup or laryngitis such as steam inhalations, the " application of warmth and moisture to the throat, an " equable temperature in the room with the administra- " tion of soothing and internal remedies. Strangely " enough I said to the parents that night that if the " throat did not improve the child would not get " better. The next day the child seemed better, both " the throat and the arm, so as not to necessitate a " second visit. I did not see it again until summoned " on Tuesday afternoon between 2 and 3 o'clock. I " saw the child was gradually sinking. It had localised " spasms, hoarseness of voice, laboured breathing, and " a rapid pulse. It died the same night. The throat " affection all through was what I mainly tried to " subdue as I have seen one or two cases of inflamma- " tory mischief following vaccination which had been " as bad if not worse, recover, but I cannot recollect " any case of that peculiar kind of hoarseness in " children so young get better, and I have never known " it before to be associated with vaccine. . . . It is " impossible for me to say whether the actual croup " from which the child died was 'immediately,' 're- " 'motely,' or 'not at all' *caused* by the inflammatory " mischief of the arm, but in my opinion its course " must have been influenced by the arm."

Father's statement. W. B., father of the child, states that up to the 3rd September, the arm seemed to do well, but it had begun to inflame on Friday, the 4th September, and the inflammation had extended to the chest by Sunday, and to the hand on Monday, the day before he died. About the 5th September the scabs became depressed so as to present the appearance of two large holes, quite black at the top, about the size of sixpences, they never discharged matter and did not unite. The axillary glands became enlarged but did not suppurate, there was no vomiting, no diarrhœa, and no difficulty in breathing. He says that the child's cry became very hoarse, and that convulsions commenced on Tuesday morning, the 8th September. The parents do not know that the child was brought into contact with any form of contagious disease. No application was made to the arm of the child before or after it was inflamed, except powdered starch; no shield was used. The day on which the child was taken for inspection was quite warm, and they do not think that the child got chilled. So far as they know, the child up to the time of vaccination was quite healthy, and this statement is corroborated by Mrs. B.'s mother, who herself has had nine children, and has consequently had considerable experience both of vaccination and of childish ailments.

Source of lymph. The lymph used with which W. B. was vaccinated was taken from the arm of A. C., of ——, who had been vaccinated with calf lymph on the 20th August. Vaccination pursued a normal course; there are three cicatrices which are a little irregular, but otherwise quite healthy.

Conclusion. In forming an opinion on this case there is no expert evidence to rely upon except that given by Dr. R. P. W. From the certificate of death given by him, and by his evidence it will be seen that he attributes the child's death immediately to the laryngeal affection, but expresses no opinion as to whether this was the primary or only the secondary cause of death.

From the history of the case it is clear that the vaccination did not run a normal course; but this does not preclude the possibility of the child's having suffered from some intercurrent disorder at the same time. Whether this were so or not, it seems certain that the pain and exhaustion resulting from the condition of the vaccine vesicles caused grave constitutional disturbance; and it is impossible to ignore the fact that they probably, at least, contributed to the child's death.

THEODORE DYKE ACLAND, M.D.

CASE 92, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of M. H. H. An inquiry was made into this case by a Medical Inspector of the Local Government Board. The following is an abstract of his report:—

Local registrar's register contains entry of death on the 16th September, 1891, of M. H. H., aged two months, certified by Dr. J. as from "Vaccination, 14 " days; blood poisoning." Dr. Theodore Thomson was directed to investigate this case and reports to the following effect:—

M. H., the mother of the child, stated that M. H. H. had been vaccinated on August 28th by Mrs. S., wife of Richard S., now deceased, but at that time engaged in the practice of his profession. She also stated that the vaccination was performed in Mr. S.'s surgery, and that several other children were vaccinated there at the same hour and on the same day. From the mother's description it would appear that the instrument with which the operation was performed was a steel-bladed lancet. She could not say whether or not this lancet was in any way cleansed between different operations. The lymph employed was, she stated, obtained from the arm of a child then present, but she was unable to give Dr. Thomson any information as to the appearance of this child's vaccination or as to whether any other children were on that occasion vaccinated with the lymph from this vaccinifer. Her own child was, she said, vaccinated in two places on one arm, and according to her statement both insertions were successful. On the third or fourth day after vaccination she noticed that her child was very cross, and also that the vaccinated arm was very red and swollen round the spots where the two insertions had been made. She alleged that she had not up to that time applied anything to the arm, but that, when she observed the state of the arm on this date, she took the child to a Mr. C. an unqualified practitioner in the neighbourhood, who gave her a powder to give the child, and advised her to "rub" dairy cream on the red and swollen part of the vaccinated arm, which she thereupon did. The mother was, Dr. Thomson found, somewhat uncertain as to the rate and manner of progression of the inflammatory process that had been set up. She, however, stated positively that on the eighth day (September 4th), when the child was again seen by Mrs. S. at her husband's surgery, the arm was red and swollen from the shoulder to the hand. She observed, however, no swelling in the armpit. Mrs. S., the mother informed Dr. Thomson, made no remarks other than that there "was no harm," and that she was "to rub nothing on it." On that date the vaccination vesicles were still unbroken and there had been no discharge from them. They were not punctured on the eighth day.

The redness and swelling began to spread to the body, according to the mother, about the ninth day after vaccination. Dr. Thomson was unable to get from her more accurate datal information than that contained in the general statement that these appearances after this rapidly manifested themselves on the whole trunk, and subsequently, on the previously unaffected limbs. The head, face, and neck remained unaffected throughout. The child was, Dr. Thomson learned, on two further occasions seen and prescribed for by the unqualified practitioner already mentioned. No qualified medical man was called in until September 15th, the nineteenth day of vaccination, when Dr. J. saw the child at its home and prescribed some medicine which was administered to the child until the following day (twentieth of vaccination), when it died. According to the mother the scabs came off on the nineteenth day but there was no discharge from the resulting sores, neither had there, she stated, at any time prior to that date, been any discharge from the vaccination places. The sleeve of the frock, she said, worn by the child on the date of vaccination and during the course of vaccinia, was short and did not reach the vaccination places. The frock was a white one. The pocks were not, she stated, injured on any occasion.

The previous health of deceased was said by the mother to have been good, save that, shortly after birth, symptoms of what she called a "cold on the chest" manifested themselves. These symptoms consisted of a slight cough and wheezy breathing. The child did not, she averred, at any time suffer from cold in the head or snuffling breathing.

The history of the parents' health is suggestive of a specific taint on both sides. The father, who speaks thickly, stated that when a boy he suffered from a skin eruption which he called "the humour," and that he has in adult life frequently suffered from "quinsy," and also that he has been considerably troubled by his hair coming out. The mother stated that, after the birth of her first child (born at full time), she had five successive miscarriages which appear to have occurred at various periods of gestation. She has had only two full-time children, the oldest, already mentioned, who appears to be healthy, and the deceased child M. H. H.

There had not been, so far as could be ascertained, any sickness, either in the H.'s household, or in the neighbourhood, of a character likely to have prejudicially affected the course of vaccinia.

Dr. J., who visited deceased at her home on the day before her death, stated that when he saw the child she was feverish and that the trunk and all the limbs were œdematous and red, while blebs containing "watery "pus" were scattered over the skin of these parts. He informed Dr. Thomson also that there were no scabs on the vaccination places, which he described as sores from which there was no appreciable discharge. He saw the child on that occasion only. He prescribed small doses of Liquor Ammoniæ Acetatis and advised no local treatment. He expressed to Dr. Thomson the opinion that the sleeve of the child's frock, which he maintains reached the vaccination places, had irritated the arm.

The house in which the deceased resided was, on the occasion of Dr. Thomson's visit, dirty and ill ventilated. The floor, which is irregularly paved with stones, was damp. There is no indoor sink, water is laid on by tap from the public supply of the district. The w.c., of the hand-flushed hopper type, was foul smelling, but is situated some twenty feet from the house.

Owing to Mr. S. having died before Dr. Thomson visited the district, and to his wife having left the neighbourhood, he was unable to see the instruments with which the operation had been performed, or to ascertain from the operator the method which had been followed. He was also unable to discover, save in so far as he was aided by the books of the Vaccination Officer for the district, the names and addresses of the children who had been vaccinated on the same date as M. H. H., and he failed to find out the name and address of the child who had acted as her vaccinifer.

From the Vaccination Officer's books he found that eight children had, in addition to the deceased, been successfully vaccinated at Mr. S.'s surgery on August 28th. Of these he saw seven, and found that in every instance vaccinia had run a normal course. One of the seven was, on the fourteenth day after Vaccination, taken ill with "fits," from which it died five days afterwards; but the mother stated that there was at no time any redness or swelling around the vaccination places on her child's arm and that the vesicles had dried up and formed scabs before death. The remaining one of these eight children Dr. Thomson did not see as it had left the district.

CASE 93, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of R. I. N.: report to the Commission of Dr. Theodore Dyke Acland.

R. I. N., aged two months, was vaccinated by Dr. R. C. at —— on the 29th September, and died on the 6th October 1891. The cause of death as certified by Mr. G. W. N., M.R.C.S., being "bronchitis."

The death of this child has not, so far as I can ascertain, been attributed either directly or indirectly to vaccination. It was reported by Dr. R. C. to the Local Government Board, because it had come to his knowledge that death had occurred within a few days of vaccination.

Both Mrs. N., the mother of the child R. I. N., and Mr. G. W. N., who signed the certificate of death, agree in stating that the vesicles looked healthy as far as they had shown themselves; and I cannot elicit any fact which would warrant the supposition that they were otherwise than entirely normal.

The child was well until the third day, at which time it gave evidence of acute catarrh of the bronchi. There was much distress and difficulty of breathing. The day after it was taken ill, Mrs. N. took the child to Mr. G. W. N. He informs me that when he saw the child he did not think that she would live; her breathing was very laboured, and there was evidently great obstruction to the respiration. He did all that could be done by way of treatment, but to no purpose. The child died on the next day, the eighth after vaccination.

So far as I can discover, vaccination did not cause any irritation or distress, either before the commencement of the child's illness or at any subsequent time, during the illness. Both Mr. G. W. N., the doctor, and Mrs. N., the mother, agree in stating that the child died of acute bronchial catarrh; and there is no evidence to the contrary.

Conclusion. I am of opinion that vaccination was not, either directly or indirectly, the cause of the child's death.

THEODORE DYKE ACLAND, M.D.

CASE 94, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of J. P. F.: report to the Commission of Dr. Theodore Dyke Acland.

J. P. F. was born in the —— Infirmary, ——, on the 1st September 1891. He was vaccinated on the 12th of the same month by Mr. A. E. C., Assistant Medical Officer.

The vaccination was performed on the 12th day after birth, in accordance with a memorandum issued by the Local Government Board and endorsed by the Union authorities responsible for the conduct of —— Infirmary. E. F., the mother of the child J. P. F., stated at the inquest subsequently held, and also at the adjourned inquiry, that vaccination was performed when her child was four days old. This statement is unconfirmed, and the records of the Infirmary made at the time the child was vaccinated, prove it to be incorrect. It has further been stated on oath, both by Mr. A. E. C., who performed the Vaccination, and by Mr. P., the Medical Superintendent of the Infirmary, that the child was vaccinated on the 12th day and not on the 5th. Mrs. F., the mother, subsequently admitted that this was correct.

The child was removed from the Infirmary by his mother on the 19th September, and died on the 13th October. An inquest was held on the 16th October, and was adjourned until Friday, the 23rd October. The verdict returned was that "the deceased died from acute con-"gestion of the lungs"; a rider being added by the jury "that, "in our opinion children born in the Workhouses "are vaccinated at too early an age."

Co-vaccinees. Four other persons were vaccinated at the same time as J. P. F.; his mother E. F. (an unmarried woman), H. L., aged 18, D. G., and G. J., infants. All were vaccinated with lymph taken directly on the 8th day from the arm of A. L. K., now residing at —— ——, ——, who was born in the Infirmary and vaccinated there. Of these I have seen all except D. G., whom I have not been able to trace, although I have communicated with her, and with a friend who visited her in the Infirmary. The results of the other vaccinations are as follows:—

E. F., the mother, vaccination normal.

H. L., vaccination scars quite healthy. Says she has not suffered in any way from the vaccination.

G. J., vaccination normal. A miserable puny infant, now (17th October) suffering from diarrhœa and much emaciated.

Vaccinifer. A. L. K., is a plump healthy baby, suffering from eczema of nates and groins; this is, I believe, due to irritation from wet napkins, and has nothing to do with vaccination. The vaccination cicatrices are almost completely healed. There are a few thin scales over the scars, but the scars are healthy and vaccination has pursued a normal course.

General considerations. The general arrangements of the Infirmary with regard to the comfort of the lying-in women and children are all of high order, and surpass in their completeness anything that I have seen of a similar nature in London. The children are admirably looked after by the resident midwife, Nurse K., who, with two assistants (resident pupils), personally superintends and regulates all the arrangements relating to the care and cleanliness of both mothers and children.

J. P. F., with the other children in the ward at the time were frequently seen both by Mr. A. E. C. and by Nurse K. and her assistants. The two former agree in stating that

although the child J. P. F. was not physically above the average of such children born in the Workhouse Infirmary, he was a fairly healthy child, and had no eruption or disorder of any kind at the time that he was vaccinated.

Method of vaccination. The children are vaccinated in the labour room which opens out of the ward, and, so far as I was able to ascertain, everything is done to ensure absolute cleanliness. The ordinary precautions were taken at the time of vaccination, and a lancet was used for the operation.

Course of vaccination. All seems to have gone well until the child was removed from the Infirmary. The vesicles were then only eight days old, and there was nothing abnormal about them.

Nurse K. states that the vesicles had all scabbed over, and that she considered them to be healthy or she would have advised the mother to bring the child back. She gave the mother some cotton wool and powder to put on the scabs, not because she thought there was anything wrong but merely as a preventive measure.

Mr. A. E. C. confirms this statement, and says that the vesicles were not suppurating when the child left his care, that if they had been he would have recommended the mother to remain. The authorities had no power to compel her to do so, and in this instance she left at her own request a day or two earlier than is usual in such cases.

On leaving the Infirmary E. F., the mother, went to live at —— and there lodged with a Mrs. L. who seems practically to have taken charge of the child from the first.

On the following day Mrs. L. saw the vesicles which were large and rather inflamed, but she says not more so than she has seen in ordinary vaccinations, and it is to be noted that being the ninth day the areola was in progress of development. She dressed the wounds with lint and powder. The child did not get on well. The scabs came off the vesicles once or twice, and Mrs. L. informs me that she thought the places had been rubbed in the night, and that she cautioned the mother about it.

General condition of child. The mother was unable entirely to feed the child, and supplemented what she was able to give it with cow's milk and water. This does not appear to have agreed with the child, for it often vomitted and had green offensive slimy stools, and its digestion was evidently much out of order. About a fortnight before it died Mrs. L. noticed that it had thrush, and gave it some castor oil which she thought would be beneficial. The child was weakly, and was always crying, so she advised its mother to take it to —— Hospital.

He was seen there on the 28th September, in the maternity department, under the name of J. "P."

The inquiries which I have made at the hospital lead me to suppose that it was not thought that the vaccination wounds required any particular treatment. The child's name is entered in the maternity book with the note "Query,—Specific," but nothing more seems to be known about him, and no special treatment was adopted for the arm. The mother attended twice at the hospital on the 28th September and the 7th October.

From that time until his death she treated him at home, applying wet rags and cold poultices to the sores. Both she and Mrs. L. agree that the vaccination wounds did not materially alter in appearance from this time onwards.

On Monday, the 12th October, Mrs. L. on going into the room where the child was being bathed noticed that it was breathing with much difficulty, that the respirations were rapid and shallow, and she thought it had bronchitis, she also noticed that the top of the right ear was black, she made it a jacket poultice which seemed to give it great relief, but notwithstanding all she was able to do, the child died at 9.30 in the evening.

Dr. B., of —— ——, was not called in until after the child's death and he states that the four vaccination vesicles although they presented the appearance of ulcers, had not sloughed and were not surrounded by an inflammation. He considers that they presented an unhealthy appearance, but he stated on oath at the inquest that he did not use the word "gangrenous ulcers," at all in his evidence with regard to them. That there was no sign of gangrene in or around them, and that although he considered them unhealthy, he believes that they had nothing to do with the child's death.

After the inquest had been adjourned he again examined the body in conjunction with Mr. P., the Medical Superintendent of the Infirmary; and they agree that there was no inflammation round the wounds. Mr. P. further states that there was no enlargement of lymphatic glands in the axilla, no erysipelas or sign of sloughing of the vesicles. These statements are corroborated by my own observations. Mr. P. stated in his evidence that in one of the ulcers there was an adherent slough, but there were no scabs covering them. He further stated that there was a *linear gangrenous patch* on the tip of the *right* ear, and some eczema behind the ear, but he did not believe that there was any connexion between this condition and the state of the arm (the left). He found that there was congestion of the bases of both lungs; dilatation of the right side of the heart, and that the vessels of the brain were engorged. He and Dr. B. agree that death was due to acute congestion of the lungs.

Query re inoculated syphilis. At the inquest the question was raised as to whether this was a case of inoculated syphilis. It is the opinion of Mr. P., Dr. B., and myself that there is no ground for such a suspicion. There was no induration of the bases of the ulcers, no phagædena, no induration of glands, no rosolous eruption. Such alterations as took place in the vesicles occurred during the second week, while the child died one day over a month from the time of inoculation.

Conclusion Consideration of the above facts leads me to the conclusion that the child died of acute pneumonia. The evidence of grave gastro-enteric catarrh was also unmistakable. It is impossible to ignore the fact that any additional cause of disturbance would tend to augment the seriousness of these conditions, and therefore the possible influence of the vaccination cannot be wholly disregarded. At the same time there does not seem to be any evidence that it was primarily responsible for the child's death.

THEODORE DYKE ACLAND, M.D.

CASE 95, REPORTED TO THE COMMISSION BY MR. J. H. LYNN.

Case of E. S.: report to the Commission of Dr. Theodore Dyke Acland.

E. S., of ——, was vaccinated in June 1891, by Mr. J., of ——, with calf lymph procured from Mr. W. F., M.R.C.S. The operation failed, but it was followed by an eruption which lasted for a few days.

Re-vaccination. A month later the vaccination was repeated. A few days after the second inoculation the incomplete vesicles dried up and the arm itself never seemed to be much affected. No true vesicle formed, and there was no inflammation or sloughing round the point of inoculation.

There was, however, a fresh eruption. This seems at first to have been vesicular, but with no exudation. Subsequently, about 14 days afterwards, it became general, the eruption being papular with some, but not much, discharge; and subsequently the child suffered from a fairly severe attack of eczema both of the head and face, and since of the body.

Present condition. There can be no doubt that the irritation is now kept up by the method of treatment; the child, when I saw her in November 1891, being dressed in a rough flannel nightgown.

Family history. The family history of the child does not seem to throw much light upon the case. Neither father nor mother have suffered from eczema. The father, in 1890, had gout. Neither of the parents are robust, but are of the ordinary type found among the working classes in large towns.

Mr. J., who has attended the family, states that the parents are cousins, and that they are persons of feeble power, and no doubt the child also is weakly.

Conclusion My opinion of the case is, that the attack of eczema from which the child is suffering is mainly due to its constitution and treatment, and that the vaccination merely acted as a determining cause of the general outburst of eczema.

THEODORE DYKE ACLAND, M.D.

CASE 96, REPORTED TO THE COMMISSION BY MR. J. H. LYNN.

Case of H. C. C.: report to the Commission of Dr. Theodore Dyke Acland.

H. C. C., of ——, was vaccinated on the 15th October, 1891, by Mr. W. P., M.R.C.S., of ——, Public Vaccinator, from the arm of J. T. M., together with eight other children. On the eighth day the child was inspected and nothing abnormal was noticed in the vesicles. Vaccination seems to have pursued a normal course until the formation of the areola. During the formation of the areola considerable inflammation developed round the vesicles, and there is now, six weeks after vaccination, a small glandular abscess in the left axilla.

It was not, however, until 18 days after vaccination that the child was seen by any doctor.

The mother states that the scabs were knocked off, but she says that the wounds were not touched; no shield was used, and no application was made to the vesicles. She also says that the child had a papular eruption on its body.

Mr. N., who attended the child, tells me that when he first saw the child he found it dirty and ill-cared for. The scabs had been rubbed off; there was some erythema spreading from them down the arm and leg, and some brawny swelling which was most noticeable round the left ankle. Mr. N. also informs me that there was some bronchial and gastric catarrh. He did not, however, consider that the local symptoms were dangerous. He had not seen the child for a week, previous to the date of my visit, the 29th November, and the axillary abscess had formed since he last saw her. There is now no œdema of the left leg, but there is a little brawny desquamation of the limb and some slight peeling of the right foot. The two skilled observers who saw the child, Mr. W. P. and Mr. N. both state that there was no erysipelas. The child's condition is fairly good, and there is no reason to think that its recovery will be long delayed.

Mr. N. informs me that he has had one child of the same family under his care who died with convulsive seizures aged 11 months. This child had extensive eczema and ophthalmia, and he thought it was suffering from tubercular meningitis. Mr. C., the father, informs me that the certificate of death states that it died of suppressed measles. There are six other children alive about whom I have no special information. The mother is anæmic and sickly looking, but it should be stated that she has had a good deal of trouble with her child, and her rest has been much disturbed.

fer. I have seen J. T. M., aged 15 months, from whom H. C. C. was vaccinated. He is a healthy-looking child, and the mother says has never ailed anything. There are three healthy cicatrices, one scab is still adherent, the vesicle having been rubbed and the scab knocked off about a fortnight before the date of my visit (29th November). Notwithstanding there has been no excessive inflammation and no enlargement of axillary glands. Before vaccination the child had slight eczema of the head, but since vaccination this has entirely disappeared.

Eight other children were vaccinated from the arm of J. T. M., all of whom have been inspected with the following results:—

T. F. B., aged 13 months. Cicatrices healthy. No abnormal inflammation. No eruption. Vaccination in this case was postponed because the child had eczema. Since vaccination he has had none.

E. B. Four normal cicatrices. Nine days after vaccination the parents told me that a vesicular eruption like chicken-pox came out all over the child and lasted for about two weeks. There is no evidence of this now. The child is fairly healthy, but is suffering from whooping-cough.

W. R., aged nine months. The child has cut four teeth in the last fortnight, during which time an abscess has formed in the *right* side of the neck. The vaccination was on the *left* arm. The abscess formed when the child first began to cut his teeth, and has, I believe, nothing to do with vaccination. The ill-health due to the irritation of teething seems to have delayed the healing of the vesicles, and one scab is still adherent, more than six weeks after vaccination (29th November). Three of the cicatrices are normal, and there is no evidence of inflammation round the other one.

E. W. A miserable child in a miserable home. Vaccine vesicles just beginning to dry up; scabs still adherent. She has had one or two subcutaneous abscesses below the vesicles and some slight eczema of her head. Vaccination was postponed on account of the child being feeble, and suffering from bronchitis and doubtful phthisis. Since vaccination she is no worse, except for the irritation of the pustular eruption.

E. K. M. A healthy well-looking child. Cicatrices covered with hard adherent scabs. No inflammation, no rash, and no enlargement of glands.

L. S. Four cicatrices well and firmly healed. Scabs fell off three weeks ago. No enlargement of glands and no rash.

P. W., aged two years, a feeble child. Vaccination was deferred in consequence of malnutrition and doubtful consumption. The child has eczema round the nates, which was present before the vaccination. Neither the eczema nor general condition is any worse since vaccination. There is one shotty gland in the axilla. The family history is bad; one brother died of rickets and its complications, and another feeble child suffered from convulsions.

A. S., aged five months, a healthy plump baby. Four normal cicatrices, no rash, no inflammation, no enlargement of glands, is teething.

Conclusion. Taking all the circumstances into consideration, it seems that the child suffered from excess of inflammation round the vesicles, accompanied by a spreading erythema. The time at which the inflammatory condition started, viz., during the formation of the areola makes it probable that it was consequent upon the formation of the areola, possibly due to some extraneous poison inoculated into the open wounds, but of this there is no proof. The course of vaccination in the other cases inoculated with the same lymph does not give adequate ground for supposing that the inflammation was due to any defect in the lymph itself or to carelessness on the part of the operator.

THEODORE DYKE ACLAND, M.D.

CASE 97, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of R. E. M. An inquiry was made into this case by a Medical Inspector of the Local Government Board; and an analysis of his report is given on page 73, where the case is numbered as Case CCIII.

CASE 98, REPORTED TO THE COMMISSION BY MR. J. H. LYNN.

Case of B. C.: report to the Commission of Dr. Theodore Dyke Acland.

B. C., of ——, was vaccinated according to the register on the 22nd September 1891, by Mr. S. (locum tenens for the Public Vaccinator, Mr. L., who was away ill with scarlet fever) directly from the arm of E. C. W.

Question as to source of lymph. According to the register eight cases in all were vaccinated directly from this same child, and also two private cases with lymph from the same source stored in tubes.

There is, however, some doubt as to the accuracy of this entry for Mrs. W., the mother of the alleged vaccinifer, states that when she brought her child up for inspection on the eighth day after vaccination, she came late, and that there was only one child there at the time, of the name of P., brought by a Mrs. K. of ————; and she says that she is certain that no children were vaccinated from her child's arm. It may further be stated that Mrs. C., the mother of the child B. C., says that she is certain that some children were vaccinated from *her* child, but of this there is no record in the register. I have been unable, in the absence of the gentleman who did the vaccinations, to reconcile these conflicting statements. Mr. L. the Public Vaccinator, writes to me as follows on the subject:—

"I have heard nothing from S., but have heard indi-
"rectly that he went to Australia last month . . .
". . I have no means of ascertaining his exact where-
"abouts, so cannot communicate with him; failing that
"I fear I cannot help you much as I have only the vacci-
"nation register to rely on, and being *hors de combat*
"myself at the time from scarlet fever, I had no means
"of checking or verifying the entries, and until your
"investigations I did not doubt their correctness."

E. C. W., Vaccinifer (?). This uncertainty as to the vaccinifer is the more unfortunate as E. C. W., from whom, according to the register B. C., together with nine other children, were vaccinated, was at the time the lymph was taken from her arm sickening with scarlet fever. This was not actually known until two days later, the irritability of the child being not unnaturally put down to vaccination. On the ninth day, however, after vaccination a brilliant scarlet rash appeared all over the body, and a few days later the child's sister J. became ill, a similar rash subsequently appeared, and desquamation followed in both cases. The child E. C. W.'s arm was much swollen at the time of the scarlet fever rash, and it became worse during the height of the fever. There does not, however, appear to have been any sloughing round the vesicles, and no abscesses formed in any of the contiguous glands. The vesicles are now quite healed. The scars show nothing abnormal, and the scabs fell off about two weeks ago (*i.e.*, from the date of my visit, the 30th November). If the register is correct it is worthy of note that not one of the children vaccinated from this child contracted scarlet fever.

Nothing was noticed amiss after vaccination until about the 11th day. Eczema then appeared round the ears, and subsequently an abscess formed in the glands on the left side of the neck with a great amount of surrounding inflammation. There is no question that the abscess was

and subsequent complications.

indirectly the result of vaccination. The eczema seems to have been started during the formation of the areola, and the abscess was due directly to the irritation of the eczema. It was opened about the end of October. Since that time the swelling of the neck has subsided, and convalescence has been uninterrupted. The child is feeble and sickly looking, but considering that it has been ill for some weeks its nutrition is good. The child is now practically well, as far as the abscess is concerned.

The cicatrices are four in number. They are large, and there is some puckering of the scars. The present condition of the cicatrix in the neck, where the abscess was opened, is satisfactory. There is some puckering round it, and some thickening of the subjacent parts to which the skin is adherent, but there is no sign now of any active mischief. There is no enlargement of the axillary glands and no trace of eczema.

I cannot ascertain that any application was made to the vesicles, except what is called "raw head," that is ordinary cream skimmed from the top of unboiled milk. It seems to be a common custom in this part of —— to apply this "raw head" to the vaccination vesicles, especially during the formation of the areola. It is supposed to have a specific effect in softening the skin and lessening the inflammation. There is no evidence to show that this application irritated the wounds, although it may reasonably be doubted whether a decomposable organic fluid is the best application to make to an open wound, especially at a time when an active inflammatory process is going on.

The statement of the mother with regard to the course of the disease and her treatment of the vesicles is borne out by Dr. M., under whose care the child has been since vaccination.

Family history. Two other children of this family have suffered from eczema. One of these also from abscesses. The latter died at the age of two years and nine months. I was unable to gather that in either of these cases there was any connexion between the eczema and vaccination.

Children recorded to have been vaccinated with the same lymph. I have seen all the children who, according to the register, were vaccinated with lymph from the arm of E. C. W., with the exception of the two private cases vaccinated with the stored lymph. These latter were reported to me by Dr. K., who vaccinated them, as having done well, and as having presented no abnormal symptoms from the vaccination.

The remaining seven children, all of whom have done well, are as follows:—

A. E. P., a healthy child; cicatrices normal. There is a large amount of eczema about the ears. The child is teething; the mother, who has eczema herself, says that all her children have suffered from eczema when they were teething.

E. J. R., a healthy child; four normal cicatrices; no evidence that there has been any abnormal inflammation.

F. J. D., a healthy child; four normal cicatrices; no trace of eczema.

E. P., a healthy child; four normal cicatrices; no abnormal inflammation or eruption.

R. C., a healthy child; cicatrices normal; this child suffers from an eruption of eczema, which she has had since birth, but which, the mother affirms, is no worse than it was before vaccination.

E. H., a feeble child; cicatrices normal. This child is no worse since vaccination although it developed whooping-cough just before the operation. All the children in this family are feeble.

B. M., a healthy child; with two normal cicatrices. There has been no excess of inflammation and no eruption.

Conclusion. I have not been able to ascertain any fact in the case which would make it reasonable to attach blame to the vaccinator. The family history of the child shows that there was a tendency to eczema; and this tendency may have been excited to activity by the vaccination.

Dr. M. agrees with me in believing that the irritation of the vesicles started the eczema, and that the glandular abscess was in its turn the result of the eczema.

THEODORE DYKE ACLAND, M.D.

CASE 99, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of S. S. An inquiry was made into this case by a Medical Inspector of the Local Government Board; and an analysis of his report is given on page 73, where the case is numbered as Case CCIV.

CASE 100, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of H. T.: report to the Commission of Dr. Theodore Dyke Acland.

H. T., of ——, aged four months, was vaccinated by Mr. W. C., of ——, on the 25th October 1891. She died on the 30th November 1891. The cause of death as certified by Mr. W. C. being "cellulitis after vaccinia, 14 days; broncho-pneumonia, 14 days."

On the 4th December when I saw the child she was dead, and the body had undergone much post-mortem change. There were three raised adherent scabs on the left upper arm. The vesicles had not run into one another, and there was no evidence of surrounding inflammation or suppuration. The axillary glands were not enlarged, and there was no sign of there having been any abscess in or round them. There were one or two small spots of eczema on the head, but beyond this there was nothing noticeable in the child's condition. She was not much emaciated, and was well grown for her age.

According to the account of Mrs. T., the mother of the child H. T., the inflammation started within three days of vaccination; that is to say, on Sunday morning, the 28th October. She then noticed that the arm was red and inflamed round the points of inoculation. The inflammation continued to spread, and on Sunday, 10 days after vaccination, the wounds were discharging freely. She did not take the child to Mr. W. C. until the eighth day. When he saw it he gave her an ointment, which, she thinks, contained carbolic acid, and ordered her to apply poultices to the wounds. She says that no scab formed at first, but that the inflammation continued to spread until about the 16th day, when the vesicles commenced to scab over. By the end of the third week scabs had formed and been removed more than once.

On the 17th day the child was seen by Mr. S., of ——, who tells me that he "did not notice any intense "redness of the skin, and that although the condition "of the vesicles looked threatening, he did not con-"sider that there was any positive indication of sup-"puration supervening"; and, so far as I can gather, neither he nor Mr. W. C. at this time thought that the child was in a critical condition. Subsequently the child developed some affection of the lung, from which she died on the 30th November, as stated.

Mr. W. C. tells me that he does not consider the case to be one of erysipelas; but he says that there was patchy redness both of the arm and of the body of the child with some brawny infiltration, but no sloughing. The child suffered much from constitutional disturbance, and although the inflammation of the arm subsided in a large degree before the onset of the broncho-pneumonia, the child never really rallied, but was feeble and depressed from the condition which had supervened on vaccination. Mr. W. C. has, no doubt, as the certificate of death implies, that the child's death, although it actually occurred from broncho-pneumonia, was accelerated by the inflammation which took place round the vaccine vesicles.

General surroundings. Immediately after vaccination the child was taken home and was put to sleep in the mother's room. The child was nursed entirely in the house, and never removed from it except on the eighth day, when it was taken to Mr. W. C. There is no drain in the dwelling-house at all, the scullery pipe discharges over an open gully outside, and there is no communication between the closet and house.

Family history. There are four children living and healthy, and there is nothing in the family history to throw any light upon the orgin of the inflammation. Neither of the other children had suffered from any cutaneous eruption, nor had they been unwell immediately before their sister was vaccinated. Early in November an impetiginous eruption appeared on the face of one child (M.) and apparently she again communicated it to her sister E., with whom she sleeps, and who is now suffering from a similar eruption on the chin, face, and ear. Neither of the children having had any similar eruption before H. T. was vaccinated; it seems probable that it was acquired, as suggested by the mother, by direct contact from the child's arm, and probably from kissing it.

Source of lymph. Mr. W. C. informs me that he does not keep a record of what particular lymph is used for each child, but that he finds in his case book a note:—"October 23rd, lymph, "2s." He further adds T.'s child was vaccinated on

" the 26th, so, I presume, that the lymph sent was used " as I should have no other in stock, and a child on " November 3rd was vaccinated, and I expect with the " other tube sent. I have heard no complaints from " others. I see also 'October 6th, lymph 4s. 6d.,' and " that the child was vaccinated on the 7th. There is " no other note as to where the lymph was obtained, " simply an account of expenses, but I have no doubt " that it came from 12 Pall Mall East, where I get " most of my lymph, and have for years."

Seeing the uncertainty of Mr. W. C.'s reply, I have not thought that it would be useful to pursue this line of inquiry further, for the source from which the lymph was obtained is uncertain. I have, however, ascertained that the child M., of ——, said to have been vaccinated with the other tube of lymph obtained on the 23rd October is quite well, and that the vaccination was satisfactory.

The vaccination was performed by scratches produced with a steel needle to which a large glass head is attached, the base of which is roughened. This form of scarifier is such as is commonly supplied by the Association from which the lymph is believed to have been obtained. Previous to vaccination the needle was taken straight out of the box in which it was sent. (Mrs. T., the mother of H. T., states that it was picked up off the table and was neither wiped, heated, nor disinfected before being used.) Mr. W. C. informs me that he invariably uses a new one for each case.

From the above facts it may be gathered that the inflammation which occurred round the vaccine vesicles in this case commenced at or very soon after the time at which vaccination was performed. Whether the result was due to some accidental contamination at the time of vaccination, or to some inherent fault in the lymph there is no evidence to show. It must be noted, however, that vaccination is stated to have been performed without any attempt to secure sterilization or even cleanliness of the instrument used. There was nothing in the condition of the child or in its surroundings which would lead me to suspect that they were in any way responsible for its death; although on this point it should be added that Mr. W. C. informs me that when he confined Mrs. T. four or five months ago, he considered the house was stuffy and unwholesome and generally deficient in ventilation. At the date of my visit, however, everything seemed to be in good order, and I could not detect any sanitary defect such as would be likely to cause erysipelas of an open wound. The child's death was accelerated by the prostration consequent upon the abnormal course of the vaccination.

THEODORE DYKE ACLAND, M.D.

CASE 101, REPORTED TO THE COMMISSION BY MR. J. H. LYNN.

Case of A. G.: report to the Commission of Dr. Theodore Dyke Acland.

A. G., of ——, was vaccinated on the 25th April 1888, by Mr. H., directly from the arm of I. M., of ——.

The child is said to have suffered subsequently from inflammation of the arm, and from sores which spread as far as the back and to th other arm. It is further stated that the vaccination marks are still red and sore, and that the child has continuously suffered since from the effects of the operation.

The mother states that from the first there was much irritation round the vaccination vesicles, and that 12 months afterwards an abscess formed in the axilla, which was opened. The mother also states that the child has suffered from eczema of the head.

It is true that the child is suffering from eczema which is affecting some parts of both arms, and two of the vaccination scars are still partially covered with an eczematous eruption. There are three or four patches as large as a half-crown on the left shoulder, and one just above the posterior fold of the axilla. There are also two patches of eczema on the posterior surface of the right upper arm, and one small one just anterior to the angle of the scapula. There is no doubt that an abscess has been opened in the axilla, and the scar is still present.

With regard to the present eruption, proof of its connexion with the vaccination must depend upon the accuracy of the history. I can get no clear evidence that any eczema appeared within the first year after the operation; but it must be noted that even at the present time the vaccination scars are distinctly eczematous, and this gives weight to the mother's statement that the eczema has existed since the time that vaccination was performed.

General considerations. There is no doubt that the child has lived under the worst possible conditions for any amelioration in her state. When I saw her (in December 1891) all the exposed parts of the body were practically *black*. The vesicles were covered with dirt, and the condition of the clothing was such, that it might well have acted as an exciting cause for the eruption from which the child was suffering. It was evident also that the eczema existed only in places which the child was able to reach by scratching, and I have no doubt (in fact the mother acknowledges that it is so) that much irritation has been produced in this manner. I may further state that medical treatment has never had a fair trial. It is true the child has been taken to doctors, and ointment for the scars has been procured; but this could not be expected to prove beneficial whilst the child was in such a condition of dirt, more especially as when I saw it, the surface of the ointment was almost as much covered with dirt as the child.

It may well be wondered under the circumstances that the child had suffered so little, for notwithstanding the discomfort, and, perhaps, suffering which she has undergone, owing to the irritation of the eruption, she looks cheery and bright. Her nutrition is excellent, and there is no reason to believe that her health is in any way affected. The mother, however, informs me that the child's health is now much better than it has been.

Vaccinifer. I. M., from whom the above was vaccinated, was removed by his parents to ——, two years ago. When last seen he is said to have been perfectly well, and I was unable to ascertain that he had suffered in any way from vaccination.

Co-vaccinees. Two children besides A. G. were vaccinated from the infant I. M.; namely, M. G. and R. S.

(1.) M. G. died two years ago of bronchitis, one and a half years after vaccination. Her grandparents tell me that her health was in no way affected by vaccination, which, as far as they know, pursued a normal course.

(2.) R. S.'s parents have removed from the house which they occupied three years ago, and I have not been able to find any trace of them.

Conclusion. The child A. G. is suffering from eczema, which may possibly have originated from the irritation of vaccination; which certainly has been kept up by the conditions under which the child has lived; and which, with equal certainty, might be cured by the most ordinary attention to cleanliness and medical treatment.

THEODORE DYKE ACLAND, M.D.

CASE 102, REPORTED TO THE COMMISSION BY MR. J. H LYNN.

Case of A. P.: report to the Commission of Dr. Theodore Dyke Acland.

A. P., of ——, was vaccinated with seven other children on the 26th August 1891 by Mr. H., the Public Vaccinator, directly from the arm of E. L., of ——.

Course of vaccination. The vaccination vesicles from the first seem to have run an abnormal course. When the child was brought for inspection on the eighth day they were more than usually inflamed, and there was a considerable amount of discharge from them. No abcesses however, formed, and there was no general eruption. The subsequent spread of the vesicles which took place did not seem to the mother of sufficient importance to necessitate her consulting a doctor again; and, as far as I can ascertain, neither Mr. H. nor any other doctor say the child, or was asked to treat its arm.

Treatment of vesicles. The pocks were dressed with Fuller's Earth, but there was a great deal of discharge, and six or seven foci of ulceration were started from them. I have not been able to trace any definite evidence that the scabs were knocked off or the pocks irritated during the formation of the areola; but the mother tells me that she thinks that the vesicles were rubbed and possibly the scabs knocked off, and this might account for the irregular course which was pursued by the vaccination. With the exception of some slight superficial ulceration which took place around the upper vesicle, all the subsequent suppuration occurred below the point of inoculation, and in the direction where the surface could be most easily affected by the discharges from the wound.

Present condition. All suppuration is now (December 1891) entirely at an end, and cicatrization is complete. There is only one scar which looks as if the ulceration had been recent. The surface of this one is smooth, deep red, with no induration

round it. The other scars are healthy and they have no surrounding induration, neither is there any evidence that the ulceration was other than quite superficial. There are no large glands in the axillæ or elsewhere. There is and has been no general eruption, and the child itself is well nourished and in good condition, and has not in the least the appearance of a child who has been seriously ill, or who has suffered from grave constitutional disturbance. The history of the case and the appearance of the child would lead me to suppose that the scars which are left are the result of secondary infection of the surrounding tissue by pus from the inflamed vaccine vesicles.

Query as to syphilitic infection.

The question has, I am informed, been raised as to whether this ulceration is not evidence of syphilitic infection. The facts that I have been able to learn entirely negative this supposition:—

(*a.*) In the first place, the child from whom A. P. was vaccinated presents no sign whatever of either inherited or primary syphilis, and its father denies—and from his manner I should say truly—that he has ever suffered from any complaint of the kind. None of the children vaccinated at the same time gave any evidence fo syphilitic taint; moreover the lancet used was cleansed between each vaccination.

(*b.*) In the next place the inflammation commenced less than a week after inoculation, and the areola was large, and there was much purulent discharge by the eighth day. There was not, and is not, any enlargement of the glands in the axilla, neither has there been any general eruption. There has been no sign of condylomata round the anus or mouth, and there have been no periosteal swellings. There has been little constitutional disturbance and none of that wasting or cachectic appearance which might be expected in a child who is suffering from specific disease. There is no induration round the only cicatrix which bears even a superficial resemblance to a primary syphilitic sore. It is also worthy of note that the child recovered speedily and well, without mercury or iodide of potassium.

(*c.*) Lastly, though not less important, none of the other children vaccinated with the same lymph present any, even suspicious, appearance of suffering from primary or secondary syphilis.

Co-vaccinees.

Seven other children were vaccinated at the same time and with the same lymph as A. P.

They are as follows:—

(1.) E. H., a fine healthy baby with three normal cicatrices; no enlargement of lymphatic glands, no eruption, and no history of having suffered in any way from vaccination.

(2.) M. C., rather a sickly-looking child, but said by the mother to be well. There are three healthy scars; but no enlargement of glands, and no evidence of their having been any inflammation or sloughing round the vesicles. The mother says that there was none.

(3.) L. H., a well-nourished child, reported by the mother to be in good health. The vaccination vesicles appear normal; there is no sign of there having been any inflammation round them, and there is no enlargements of the glands. In both axillæ there are now a few scattered soft cicatrices covered with thin scabs; the cicatrices have no induration round them. There is one smaller patch on the right buttock, but none in any other part of the body. It is by no means certain that this eruption did not exist before the vaccination was performed; it probably did so exist, for the mother tells me that one of the child's sisters has a similar eruption, and although she first noticed it on her child—about the time when vaccination was performed—she did not attach any importance to it, thinking that she had contracted it from her sister, who had suffered from it for a considerable period previously. The eruption is trivial, and is very localised, never having been general on the body. I think it is extremely doubtful whether it has any connexion with vaccination. The child's health has not in any way suffered from it.

(4.) J. H., a healthy well-nourished child. There are three healthy cicatrices, one very small shotty gland in the axilla, but no evidence of any inflammation round the vesicles. The child is teething, and since he began to cut his teeth has suffered slightly from eczema of the face.

(5.) J. K., a healthy-looking child, with three normal cicatrices. It has not suffered in any way since vaccination. There is no evidence of rash, inflammation, or enlargement of glands. There are one or two small spots of eczema on its face.

(6.) H. A. The parents have moved since vaccination, and all traces of them are lost.

(7.) J. S., a typically healthy baby. Three normal cicatrices, no enlargement of glands and no eruption.

Vaccinifer.

The vaccinifer, E. L., is a typically healthy baby, aged 12 months. The mother says that he has never ailed anything, and this statement is fully justified by his appearance. He has three healthy vaccination scars, without any sign of there having been any eruption, suppuration, or enlargement of glands, and both doctor and mother agree in stating that he has never had any.

Conclusion.

Consideration of the above facts leads me to the conclusion that the eruption from which A. P. suffered was due to an extension of inflammation round the vaccine vesicles; and that it was caused by self-inoculation with pus discharged from them. I am of opinion that there is no evidence to show that the eruption was syphilitic, and, as far as it is possible to judge from the present condition of the child, its health has not in any way suffered.

THEODORE DYKE ACLAND, M.D.

CASE 103, REPORTED TO THE COMMISSION BY MR. J. H. LYNN.

Case of C. G.: copy of the depositions taken at an Inquest held on the body of C. G., and of the verdict returned by the Jury.

The Information of R. G. of ——, cotton operative, and M. H., wife of S. H. of ——, labourer, taken and acknowledged on behalf our Soverign Lady the Queen touching the death of C. G. at —— on the 24th day of November in the year of our Lord One Thousand Eight Hundred and Ninety One before me ——, Gentleman Coroner for —— on view of the body of C. G. then lying dead within the said County of ——.

R. G., of ——, cotton operative, upon his oath saith: The deceased C. G. was my daughter. She was five months old. She has been a healthy child since birth. I and my wife took the deceased to bed with us at 11.30 on Sunday night the 22nd November 1891. She was then awake; she was fed with a bottle. I placed the deceased between us and gave her the bottle. She fell asleep and I fell asleep. I awoke at four o'clock, and on looking at the deceased found her dead. I did not feel her move or hear a cry before I got out of bed. Her feet touched my thigh and they felt cold. I then felt at her hands and found them cold, and I then got out of bed. There was warm milk and water in the bottle. She has not got any teeth, nor are there any signs of any. Myself and wife and the deceased and another child, aged two years, slept in one bed. I did not overlay nor did my wife overlay the deceased. When I found the child dead I went in search of a policeman. I called in a neighbour named M. H., who looked at the deceased and said she was dead. The deceased was vaccinated a fortnight ago, which made it very cross, but did not make it very ill. It had frothed at the mouth, and it is very much discoloured on the back.

R. G.

Taken upon oath
this 24th day of
November 1891.
Before me,
F. N., Coroner.

M. H., wife of S. H., labourer of ——, upon her oath saith:

I have nursed this baby since it was six weeks old until it was five months old. She was brought to me at 5.30 in the morning and taken home at six o'clock in the evening. It has been a healthy child until it was vaccinated a fortnight ago. Since then it has been cross. The child would have been brought to me on Monday last to nurse if it had lived. I was called into the house by the last witness at four o'clock on Monday morning last. The mother was holding the deceased on her knee when I got in. I examined it and found it was dead. It was discoloured on the left arm and down one side. I noticed froth at its mouth.

her
M. + H
mark.

Taken upon oath
this 24th day of
November 1891.
Before me,
F. N., Coroner.

(*Verdict.*)

That the said C. G. on the 23rd day of November 1891, at ——, died from convulsions.

CASE 104, REPORTED TO THE COMMISSION BY MR. J. H. LYNN.

Case of C. A. S.

Copy of statement forwarded to the Commission by Mr. J. H. Lynn.

C. A. S., of ——, was born July 29th, 1891, and after three unsuccessful operations was vaccinated about the 1st November from calf lymph (according to the mother) by Dr. T. P., of ——. She was quite well before vaccination. Erysipelas appeared about seven days, spreading from arm all over body, the arm becoming badly ulcerated. After vaccination the child was treated by Mr. I. P., of —— who gave certificate of death from "erysipelas and "convulsions." The Medical Officer of Health, Dr. W .F. M. J., of ——, the mother affirms, admitted that vaccination was the cause of death. Child died December 5th. Parents healthy. Other child quite healthy. No other death in the family.

11th December 1891.

Copy of two letters received by the Commission from Mr. T. P. by whom C. A. S. had, it was stated, been vaccinated.

DEAR SIR, December 15th, 1891.

I BEG to inform you that I did vaccinate a child C. A. S., of ——, and that the said child was vaccinated from animal lymph, and also several other children at the same time and with the same lymph. Your communication is rather a surprise to me as I had not heard of the case before. The other children vaccinated at the same time with the same lymph are quite well. I might say my own sister's child was vaccinated from the same lymph. I called upon the parents of the deceased child yesterday, the 14th inst. They informed me that Mr. W. F. M. J. had not seen the child at all, and that he did not make the observations attributed to him in your communication to me. I am of opinion the deceased child did not die from the effects of the operation of vaccination.

I am, &c.
T. P.

DEAR SIR, February 8th, 1892.

I BEG to inform you that I did see and inspect the arm of the child C. A. S. on the eighth day (only) after she was vaccinated by me. There was not at that time anything abnormal, in fact the inflammation of the arm was less than usually takes place on the eighth day after vaccination.

I am, &c.
T. P.

Bret Ince, Esq.

Copy of a letter received by the Commission from Mr. I. P., under whose care C. A. S. was stated to have been after vaccination.

DEAR SIR, December 18th, 1891.

RE death of C. A. S., of ——, said to have died of vaccination.

The child was first seen by my assistant on the 1st inst., in response to an application for a visit. He found that it had recently been vaccinated, but the pock marks had been rubbed off, and the places occupied by the marks in a state of ulceration. He also found erysipelas of an inflammatory, cutaneous form on the chest, forearm of vaccinated arm, and also on the shoulder and unvaccinated arm. I saw the child next day, and found that the erysipelas had nearly all disappeared, and the child's general condition greatly improved; so that I was much surprised when the mother called on the morning of the 4th stating that the child had died suddenly in convulsions that morning. As a matter of fact, neither I nor my assistant ever suggested to the mother, or any one else, that the child had died from vaccination.

I am, &c.
I. P.

Bret Ince, Esq.

Copy of a letter received by the Commission from Mr. W. F. M. J., mentioned in Mr. J. H. Lynn's statement.

—— Local Board of Health,
DEAR SIR, December 18th, 1891.

MRS. S.'s statement with regard to myself is a complete falsehood. I visited the premises in my official capacity, gave instructions as to disinfection, cleansing, ventilation, &c., and that was all.

As I understand, you have written to Dr. I. P., I assume Dr. T. P. has also been applied to. I think, therefore, that it only remains for me to say that there did not appear to be any local insanitary cause for the erysipelas.

I remain, &c.
W. F. M. J.

CASE 105, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of G. E. P.: report to the Commission of Dr. Theodore Dyke Acland.

G. E. P. was vaccinated on the 3rd November 1891 at ——from calf No. —— with 64 other children.

Course of vaccination.

Vaccination pursued a normal course until the afternoon of the 10th December, five weeks afterwards.

Course of illness.

An erysipelatous blush then appeared round the wounds; the inflammation spread until it reached the wrist. There was a good deal of brawny induration reaching as far as the middle of forearm; but there was no sloughing on or round the vesicles, nor did any abscess form either in the arm or in the contiguous glands. The scabs did not fall off, neither was there any increased discharge from the vesicles. The child's health was not seriously disturbed, and on the day of my visit, 18th December, she was convalescent. At this date there were four adherent scabs, a little moisture round the lower one, and some brawny desquamation of the arm over the area which had been inflamed; but there was no sign of active inflammation, and the child was bright and cheery, and evidently not suffering in any way from the condition of its arm. During the week the child has been under treatment by Dr. R. C.

Considerations as to source of infection.

It would seem to be improbable that the erysipelas was directly due to the vaccination, although no doubt it started from the vesicles; but it did not commence until five weeks after vaccination. After inspection the child did not leave the house, and, as far as I could ascertain, had not been exposed to any infection, and did not receive any injury to the vesicles such as might prove the starting point of erysipelas.

The rooms occupied by the mother are beautifully clean and well kept, and the only drain communicating with the soil-pipe is the sink in the back room, which is well kept, clean, trapped, and perfectly sweet. The closet and the soil-pipe are entirely outside the room, ventilating into the open air and not connected with the dwelling-house in any way.

Conclusion.

The child G. E. P. suffered from erysipelas starting from the vaccination wounds five weeks after inoculation, but I have been unable to detect any circumstance either in the child's conditions or in its surroundings which would seem to constitute a source of danger.

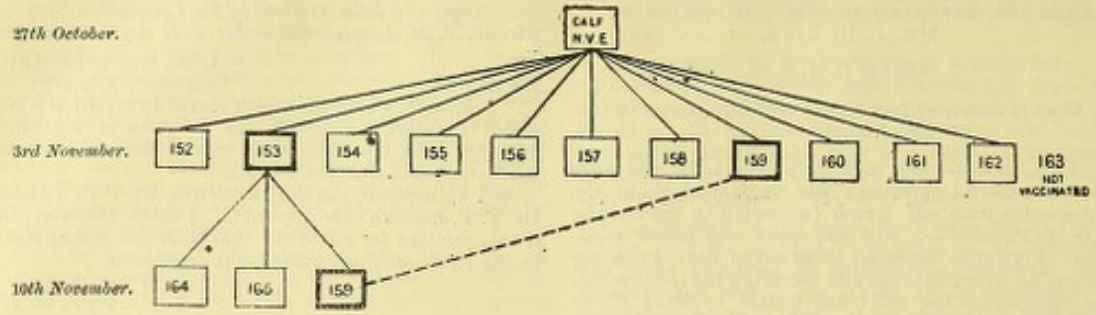
THEODORE DYKE ACLAND, M.D.

CASE 106 [SERIES], REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of E. H. O. and A. M.: report to the Commission of Dr. Theodore Dyke Acland.

General statement.

Twelve cases were presented for vaccination by Dr. M., of ——, Public Vaccinator, on the 3rd November 1891. Eleven were vaccinated with calf lymph stored on points, and one (No. 163 in register) was rejected on account of ill health. On the 10th November all 11 cases presented normal appearances except A. M. (No. 159 in register), on whose arm only two vesicles had formed. A. M. was then, on the 10th November, re-vaccinated from E. H. O. (No. 153 in register).



Both E. H. O. (No. 153) and A. M. (No. 159) suffered from erysipelas and subsequently died.

Chronological statement.

Date.	Day after Vaccination.	E. H. O. (No. 153).	A. M. (No. 159).
3rd Nov.	1st	Vaccinated with calf lymph.	Vaccinated with calf lymph.
10th „	8th	Four normal vesicles	Two vesicles only formed. Re-vaccinated from E. H. O.
26th „	24th	Two scabs off; vesicles well; discharge from two scabs which stuck to night-dress.	—
27th „	25th	- - -	One scab off; wound cicatrised; rash on body.
28th or 29th Nov.	26th	Diffuse inflammatory blush spreading to body.	Swelling of arm, spreading to trunk and scrotum. Scabs came off. No discharge.
12th Dec.	39th	Death.	—
16th „	43rd	- - - -	Death.

E. H. O. Firstly, as to E. H. O., aged three months, of —— (No. 153 in register).

Vaccination. 3rd November 1891 by Dr. M., Public Vaccinator.

Death. 12th December 1891.

Certified cause. "Vaccination; erysipelatous inflammation; asthenia."

Certified by. Dr. M.

Source of lymph. The child E. H. O. was vaccinated by Dr. M., of ——, Public Vaccinator, in his own surgery with calf lymph obtained from the National Vaccine Establishment. On the 31st October 1891 six points were sent. These had been charged from calf No. —— on the 27th October, and the package was not opened by Dr. M. until the time at which he began to perform his vaccinations on the 3rd November.

Co-vaccinees. Dr. M. vaccinated 11 children with the six points, each of them in four places. On the 8th day ten of these presented normal appearances, one, A. M. (No. 159 in register), had only two vesicles, and according to his usual practice Dr. M. vaccinated him again in two more places, taking the lymph from the arm of E. H. O. Both E. H. O. and A. M. died of erysipelas. (As to A. M. *see* page .) The nine other co-vaccinees were all seen by me on the 6th February 1892. The results were as follows :—

No. 152. (i.) P. T. B. A healthy baby, with four normal scars. There had been slight inflammation round the vesicles; but no eruption and no enlargement of glands.

No. 154. (ii.) F. Y. A typically healthy baby, four normal cicatrices; no eruption, no enlargement of glands.

No. 155. (iii.) F. B. A healthy baby, three normal cicatrices; no eruption, no enlargement of glands.

(iv.) W. A. H. Four healthy cicatrices; no rash and no enlargement of glands.

No. 157. (v.) J. K. A healthy child with three normal cicatrices; no excess of inflammation, no eruption. The arm was well by the third week.

No. 158. (vi.) F. G. Four healthy cicatrices; no inflammation, no eruption. A healthy child.

No. 160. (vii.) B. G. A fairly healthy, though not very strong, child, three healthy scars; no eruption, no enlargement of glands.

No. 164. (viii.) K. E. G. A healthy child, four normal cicatrices; no inflammation, no eruption.

No. 162. (ix.) L. G. Vaccination normal; no eruption, general health did not suffer at all, one good and three slight cicatrices.

The vaccination of A. C. J. (No. 163) was postponed. Forty-seven other cases were vaccinated directly from the same calf, No. ——, and the vaccinator believes that they all did well with the exception of one who suffered from superficial sores which came under treatment five weeks after vaccination, and readily healed under the application of zinc ointment.

Sir George Buchanan informs me that 96 points from the same calf were distributed by the Local Government Board among 24 practitioners, "20 of these, including "Dr. M., reported usual favourable results," one of these adds (after "two insertions and two good vesicles") the words "rather inflamed."

Sub-vaccinees. Three, namely :—

No. 159. (i.) A. M., referred to above. (And *see* next page.) Died of erysipelas on the 16th December 1891.

No. 164. (ii.) M. L. A healthy child, four normal cicatrices; no inflammation, no eruption. Vaccination throughout pursued a normal course.

No. 165. (iii.) I. S. A puny child, two normal cicatrices; no excess of inflammation, no eruption, no enlargement of glands. Vaccination throughout pursued a normal course.

Dr. M. informs me that it is probable that both M. L. (No. 164) and I. S. (No. 165) were vaccinated *subsequently* to A. M. at his second vaccination on the 10th November.

Course of vaccination and illness. On the eighth day the arm presented a normal appearance; and the vesicles were opened and lymph was taken from them for vaccinating A. M. and the two other children. The vaccination continued to pursue a normal course, and about the 26th November the wounds were almost healed, and two of the scabs had fallen off. About this time, the date is not exactly known, some injury occurred to the two remaining scabs which, owing to a slight discharge, stuck to the child's night-dress. About two days after this occurrence the child began to be unwell, "and a diffuse "inflammatory blush followed the injury spreading over "most of the body." The child was taken to Dr. M., but notwithstanding his treatment it sank and died of exhaustion on the 12th December.

Treatment of vesicles. No shield was used. After the injury to the vesicles cold bread poultices were applied with a view of allaying the irritation. From this time the child was under medical treatment until the time of its death.

Previous history. So far as is known the child was healthy up to the time of vaccination.

Family history. Mother healthy. Father had suffered from erysipelas of the face when he was 15 years old, but has had no recurrence of it. One child, five years ago, died when two months old of erysipelas starting from a spot on the back of the neck. It was ill only for a week, and had not been vaccinated. There are two other children who are healthy.

General surroundings. The cottage is clean and very tidy. The closet is entirely separated from the house and is sweet; the old one had just been removed and the remains of it were still in the garden. The sink is drained by a pipe which receives nothing except the water from it. So far as the parents know, they have not been in contact with any infectious disease, and they have not had any sickness in their house.

Secondly, as to A. M., aged three months, of —— (No. 159 in register).

3rd November 1891 by Dr. M., Public Vaccinator. Unsuccessful; two vesicles only formed.

10th November 1891 also by Dr. M.

16th December 1891.

"Erysipelatous inflammation; asthenia."

Dr. M.

For the first vaccination, calf lymph obtained from the National Vaccine Establishment on the 31st October 1891 and derived from calf No. ——. On the eighth day two vesicles only having formed Dr. M. vaccinated again direct from the arm of E. H. O. (No. 153).

With regard to this second vaccination Dr. M. writes—"I look on four vesicles of good size as a satisfactory "vaccination; two marks are imperfect as a rule, and ex-"perience has shown them to be insufficient. If one "vaccinates at all one should do it sufficiently, or we may "have the imputation that vaccination confers but poor "protection. No case has suffered in my experience, over "20 years, from this further vaccination, and I see no "reason to change. I know of no special instructions, "but I am responsible for my certificates of successful "vaccination."

This child, E. H. O., was vaccinated on the 3rd November from the same calf lymph as that used for A. M.'s first vaccination. Up to the time of vaccination E. H. O. was considered a healthy child. Vaccination pursued a normal course until the fourth week, when an injury occurred to the scabs, owing to their sticking to the night-dress. Two days afterwards erysipelas supervened, of which the child died. (See previous page.)

(*a.*) Ten other children were vaccinated with the same calf lymph by Dr. M. on the 3rd November. On the eighth day all presented normal appearances. One E. H. O., vaccinifer for A. M.'s second vaccination, as has been stated above, subsequently developed fatal erysipelas.

(*b.*) Forty-seven children were vaccinated direct from same calf. All did well except one, who subsequently suffered from superficial sores, which yielded readily to treatment.

(*c.*) Ninety-six points from the same calf were distributed by the Local Government Board among 24 practitioners. Twenty of these, including Dr. M., reported favourable results, one of these adding (after "two insertions; two good vesicles") the words "rather inflamed."

Two, M. L. and I. S. Vaccination normal in both. (See previous page.)

None.

When inspected on the eighth day the arm presented a normal appearance. The mother states that all went well until the 21st November; Dr. M. says the 28th November, and this latter is doubtless the correct date, since the order for medical relief signed by the relieving officer, which I have seen, is dated the 29th November, and the mother herself admits that the child was taken ill the day before she obtained the order. A few days previous to this one of the scabs from the first vaccination had come away. There was, however, no discharge from the place, which was quite dry.

On the 27th November, 17 days after re-vaccination, the child became fidgetty, and a rash appeared on the body. The mother states that inflammation commenced round the vaccination cicatrices. Next day the shoulder was swollen and inflamed, and the child was taken to Dr. M. The swelling continued for nine or 10 days, spreading down the legs and to the scrotum. The vesicles themselves did not alter much in appearance, except that the scabs came off, but they all dried up, and there was no sloughing or discharge from them.

Dr. M. states that when he first saw the child on the 28th November there was "a rash about the neck which "might have been called rubeola; it was only after "watching its progress that one recognised its true "character." There was a clear area of apparently healthy surface between the vaccination marks and the rosy blush.

There seems no reason, however, to doubt that the swelling and inflammation which appeared was cutaneous erysipelas, spreading from the vesicles, and starting on the 25th day after the first vaccination with calf lymph, and the 18th day after the second vaccination from E. H. O.'s arm.

Previous history. Up to the time of vaccination the child was believed to be in good health.

Family history. A. M. was one of 10 children, eight of whom resided with their parents in the cottage. There was no illness at the time amongst them, and none was known to have existed recently.

General surroundings. Dr. M. informed me that the condition of the cottage and of the cradle in which the child slept was at the time of my visit very much altered for the better since he first saw it. He said that it had been much cleaned up in preparation for my visit, and there were many evidences that this was the case. As Dr. M. stated in his letter, the cottage was very much crowded. At the same time the condition under which the child lived is that of a large number of children of agricultural labourers. The cottage was small, but there was free communication with the open air. There were two bedrooms, besides the living room, opening into one another, which were small but reasonably clean, though the walls were saturated with damp which was visible on them.

Sanitary conditions. There were no drains or sink communicating with the living room. The closet was at the rear, entirely separate from the house, and close to it there was a stagnant pool of offensive water partly derived from an adjacent pigstye. In the outhouse there was a sink emptying directly over a pit which was full of the most offensive decomposing slops. The general condition of the house and its surroundings was unwholesome, and when Dr. M. first saw the child in its own home he found the cradle dirty, and the blanket soiled with urine and other matters, a condition of things highly dangerous to an infant suffering from an open wound.

Summary as to both children, E. H. O. and A. M. The two children, E. H. O. and A. M., died of erysipelas, which in both instances appears to have started from the vaccination wounds.

At first sight it would seem probable that the two cases stood in some intimate relationship to one another. They were both vaccinated on the same day, the 3rd November, and one was re-vaccinated from the other on the 10th November. This latter occasion is, as far as can be ascertained, the last time the two children came into contact with one another. Under any circumstances, it is a remarkable fact that, so far as is known, only two cases vaccinated from one whole batch of lymph should suffer from erysipelas and die, and that they should be the only two who came into the close relationship which is implied by one being re-vaccinated from the other.

(*a.*) It is *prima facie* improbable that the original lymph was at fault. The adoption of such a view would involve two assumptions.

First.—That the virus of erysipelas could remain dormant in a wound for a period of twenty-five days (the time subsequent to vaccination at which E. H. O. first showed signs of indisposition), the wound meanwhile going through the process of granulation and cicatrization without any apparent irregularity.

Second.—That the children did not become infected from some other source between the 3rd and the 28th November.

Further, as has been stated, as far as is known, all the other children vaccinated with the same lymph did well with two slight exceptions. This latter fact cannot, however, be pressed too far in the way of evidence, since the vaccinations of the two children who are the subject of this report being normal on the eighth day were amongst those returned as successful.

(*b.*) The second hypothesis that suggests itself is that the two children were simultaneously infected on the 10th November, when A. M. was vaccinated for the second time and E. H. O.'s vesicles were opened. Assuming for the moment that the erysipelas virus could remain dormant in the wounds for the eighteen days which elapsed between the 10th November (the date of the second vaccination) and the 28th November, the date on which the arms of both children were inflamed, there are obviously many

possible sources of infection. For instance, the erysipelas might have resulted from some contagium conveyed by the person or instruments of the vaccinator; or by some person at the surgery at the time of the vaccinations. With regard to the former, I have not had the opportunity of seeing Dr. M. vaccinate, but from the order and cleanliness of his surgery, and from the information which he has placed at my disposal, it would seem that he exercises more than usual care in his vaccinations. He assures me that the lancet is never used for any purpose but vaccination, that it is never used by his assistant, and that he is very particular to thoroughly cleanse it before each vaccination. He never, under any circumstances, uses old ivory points, and never uses ivory points for rubbing in the lymph. He had not been attending any case of sloughing wound, septicæmia, or erysipelas, at or near the time when the children were vaccinated, and although he attended several labours at that time, they all did well. I have also been unable to trace any case of erysipelas or infective disease which might have been present at the vaccination station on the 3rd or the 10th November, so that all the obtainable evidence goes to show that there was no extraneous source of contagion present at the surgery on the days on which E. H. O. and A. M. came together there. Even had there been any such source of danger it is hardly probable that the two children could have been infected at that date, and the appearance of the erysipelas have been so long delayed. Such a theory would need to be supported by the clear evidence of facts showing that there was some definite source of danger and that it did actually affect the two children. There is no evidence on either of these points.

(*c.*) It might further be thought possible that the virus of erysipelas was derived originally from E. H. O., whose family showed an unusual tendency to contract the disease. There is, however, no suspicion that E. H. O.'s vaccination began to pursue an abnormal course before the 24th November at the *earliest*, that is, 16 days after he had acted as vaccinifer to A. M.; and there is no ground for assuming that E. H. O. was suffering from or incubating erysipelas when A. M. was vaccinated, and that the poison was conveyed to him from E. H. O. in the process of vaccination.

(*d.*) In the case of A. M. it might perhaps be argued that the re-vaccination of an arm close to vesicles already in their second week might produce some abnormal results, but there is no ground for supposing that in this instance such was the case, for the vesicles pursued a normal course, developed without complication, and were nearly healed before the erysipelas was first noticed; and futher, this theory would not explain the erysipelas in the case of E. H. O.

(*e.*) The further question may possibly be asked whether vaccination itself without any extraneous cause could have produced the fatal results. To this it may be answered that there is no proof that the virus of erysipelas is contained in uncontaminated vaccine lymph; and even if this hypothesis were capable of demonstration the history of these cases would go far to negative the conclusion that in this instance the fatal issue could be so explained. In both cases the acute results of the vaccination had subsided; the areola had faded, and the vesicles had almost healed, before the erysipelas appeared. It would be in the highest degree improbable that any inflammatory affection, which was an essential part of the vaccination, processes should be deferred until the vesicles were nearly well, and the inflammation caused by their formation had subsided.

(*f.*) If the various foregoing possibilities can be dismissed it remains to be considered only whether the two children contracted the erysipelas from extraneous sources independently of one another, and whether their connexion as vaccinifer and vaccinee was merely a coincidence. The probability of this last hypothesis can only be arrived at by a process of exclusion such as has been attempted.

In favour of this view it should be noted that E. H. O.'s father had suffered from erysipelas, and that one other child of the same family had died from it; that vaccination seemed to pursue a normal course until the vesicles were injured by the scabs sticking to the child's nightdress. In the case of A. M. there existed many conditions which might prove dangerous to an infant suffering from an open wound. The house was cold and damp. The child's immediate surroundings were dirty, and its cradle fouled with excreta, whilst outside the conditions were insanitary owing to the overflow of offensive slop water and the stagnant pool which received the drainage from the pigstye.

Conclusio

There is no adequate evidence to show what the source of infection was in each case, so that it is not possible to state with certainty that the erysipelas was not due to some factor in the process of vaccination which affected both children equally at the station on the 10th November; taking, however, all the circumstances into account, it seems probable that the fatal erysipelas which occurred in these two children originated from independent sources; and that the fact of the one having been vaccinated from the other was a coincidence only, and not causally related to the erysipelas, which eventually developed.

THEODORE DYKE ACLAND, M.D.

CASE 107, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of H. S. An inquiry was made into this case by a Medical Inspector of the Local Government Board. The following is an abstract of his report:—

Local registrar's register contains entry of death, on the 16th December 1891, of H. S., aged three months, certified Dr. Hn. as from "Vaccination; erysipelas." Dr. Bruce Low was directed to investigate this case and reports to the following effect:—

H. S. was vaccinated, at the age of two months, by the Public Vaccinator, Dr. H., at the public station, on November 18th, 1891. Mrs. S., the mother of deceased, states that her infant, though "not very strong" from birth, was apparently in her usual health when vaccinated. On the eighth day, November 25th, she took her for inspection, when there were four uninflamed vesicles on the arm. The Public Vaccinator did not prick or meddle with the pocks. The same evening (November 25th) the places looked irritable, and next day became somewhat red. The redness gradually extended up and down the arm. Becoming alarmed, the mother sent for Dr. H. on the evening of November 29th. While Dr. H. attended the child the "inflammation" spread across the chest and back. Some red patches appeared on the legs, but subsided under treatment. As the "inflammation" spread over the trunk it diminished in the arm. On December 9th the child cried a good deal, and the mother being dissatisfied with the slow progress of the case dismissed Dr. H. and sent for Dr. Hn., who came the same day and saw the child. He did not see it again, the arrangement being that he should be kept informed of the child's progress. About this time, viz., between the 10th and 14th December, Mrs. S. says the scabs dropped off spontaneously. On December 15th the baby had four convulsions, and died next morning, December 16th (the 29th day of vaccination), before Dr. Hn., who was sent for, arrived.

Mrs. S. has five other children, all in good health, save one who is said to have "a weak chest." The mother herself is a delicate woman suffering from marked anæmia. The deceased infant was fed from the breast; her dress was of white washable material; the sleeve was looped up. No shield was worn. The only application made to the arm by the mother before getting medical advice was "cold "water cloths." The house and its inmates were clean when seen by Dr. Bruce Low. No septic or zymotic illness had occurred of late in the house, and no illness of the kind was prevalent in the neighbourhood except influenza. Since the baby's death the family has removed. Their former house is stated to have been cold and very damp, and this, the mother says, injuriously affected their health, hence the removal.

Mrs. S. admits that on the day of inspection, November 25th, a slate-coloured woollen shawl, in which the child was wrapped, stuck to the vaccinated arm, and was with difficulty detached from it. From her account it is almost certain that the vaccine vesicles were accidentally crushed or rubbed on this day while carrying the infant home from the station, and that the shawl wetted by the weeping vesicles became dried into the vaccination places, which were injured in the forcible removal of the shawl from them. The cold water cloths applied to the arm after this were old linen rags taken from a store locked up in a drawer. Mrs. S. assured Dr. Bruce Low that the rags were clean. The water used for soaking the cloths was taken from the rain-water barrel in the back-yard. She used this water because it was "soft." She admitted the barrel was filled by the washings from the roof, and, therefore, likely to contain soot, bird-droppings, and other impurities.

Dr. H., the Public Vaccinator, seems well acquainted with his duties. He vaccinates with an ordinary lancet, which was clean and bright when seen by Dr. Bruce Low. He carefully cleanses it, he says, between each operation; it is kept in a case, and only used for vaccination purposes. His register shows that on November 18th, five children were vaccinated at the public station, four direct from the arm of H. T., and one direct from the arm of an infant named R. Dr. Bruce Low visited the homes of the above-named children, and from the mother in each instance received an assurance that the vaccination had run a perfectly normal course. In none had there been any undue inflammation, and in none had there been departure from normal vaccination. The vaccinifer T. resides at B., and is a plump, healthy child. Her mother says the scabs dropped off by themselves in about three weeks from the day of vaccination. Dr. Bruce Low made inquiries as to any "bad arms" resulting from cases done by Dr. H. since his appointment in October 1891, but he had heard of none.

Dr. Hn. states he only saw the child once. He found it suffering from erysipelatous patches on the body. Traces of the disease were upon the vaccinated arm. He is of opinion that the vaccination was not the direct cause of the erysipelas, but that the septic poison found an entrance to the child's system through the vaccination wound, as it might have done through any other wound. He was unable to suggest in what manner the poison reached the wound.

Case 108, reported to the Commission by the Mother of the Child.

Case of B. Copy of a letter received by the Commission from the medical man by whom B. had, it was stated, been vaccinated.

Dear Sir, January 16th, 1892.

In reply to yours of the 11th instant, I vaccinated the baby B. on November 19th with another named L. from a baby named S.

On the eighth day both were successful in three places and with scarcely any areola. I took lymph and vaccinated other children from L., but did not take any from B. partly because I had enough from L., whose family history I was familiar with, and partly because baby B. was very small and had an aged expression, and I did not know anything of the family history.

I was called in to see the child on December 14th, when I found she had been ill for a few days. The chest was covered with an erysipelatous blush, but without any vesicles. I was told it had commenced in the vaccinated arm, but that I cannot vouch for as the arm, though a little red was not more than might have extended from the chest, and the vaccination marks had perfectly healed and looked quite healthy.

The erysipelas then spread to the abdomen and then to the legs, and the child died of exhaustion on December 22nd, 1891.

There have been a good many cases of idiopathic erysipelas in the town during the autumn and winter, apparently due to the very wet season and clay formation.

Tabulated below I give the history of the lymph used before and after November 19th, 1891.

I am, &c.

Bret Ince, Esq. G. A. D.

P.S. I may add that I always use an ordinary bleeding lancet for cleanliness sake, and always wash it before and after use. I have not vaccinated any until this week since November 26th, as I was obliged to postpone all cases of vaccination in consequence of the severe epidemic of influenza. I begin the new series with calf lymph.

G. A. D.

Name of Child.	*When vaccinated.*	*From what Source.*	*Result, with Number of Vesicles.*
B. - -	November 19th	From S.	Successful. Three vesicles.
L. - -	„ „	„ „	„ „
S. - -	„ 12th	„ Bl.	„ „
Bl. - -	„ 5th	„ J.	„ „
J. - -	October 29th	From points off W.	„ „
W. - -	„ 15th	From Ba.	„ „
Ba. - -	September 28th	From Ba., a sister.	„ „
Ba. (sister) -	„ 21st	From calf lymph	„ „
	History of Lymph after.		
D. - -	November 26th	From L.	„ „
O. - -	„ „	„ „	„ „

N.B. None done since until this week, when I commenced as usual fresh series with calf lymph.—G. A. D.

Case 109, reported to the Commission by the Local Government Board.

Case of M. E. R.: report to the Commission of Dr. Theodore Dyke Acland.

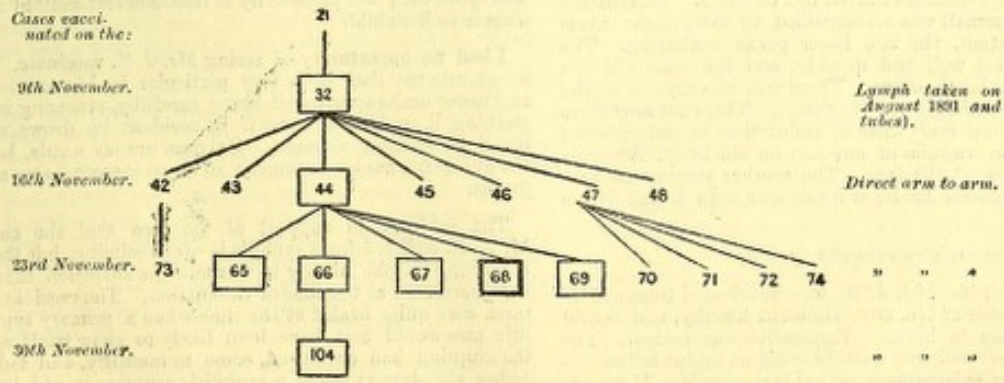
M. E. R., aged about two months, of ——, was vaccinated on the 23rd November 1891 by Mr. J. S., Public Vaccinator; her number in the register being 68. — *Vaccination.*

31st December 1891. — *Death.*

"Vaccinia syphilitica; marasmus." — *Certified cause.*

Mr. H. E. G., M.R.C.S., of ——. — *Certified by.*

Direct from the arm of P. B. T. (No. 44 in the register). The pedigree of the lymph is given in the diagram below. — *Source of lymph.*



The numbers given are those in Mr. J. S.'s register. Having in the course of my inquiry seen Nos. 32, 44, 66, and 104 in the direct line and Nos. 65, 67, and 69 who (with No. 66) were the co-vaccinees of No. 68, the subject of this report, without finding any case in which there seemed even a suspicion that syphilis had been inoculated in the act of vaccination, I did not pursue the inquiry further.

At the date of my visit six months had elapsed since No. 32 and five months since No. 104 was vaccinated, a period of sufficient length to allow any manifestation of inoculated disease to develop and show itself.

Vaccinifer of vaccinifer.

The lymph for vaccinating No. 32 was taken from the arm of No. 21, E. T. C., of ——, on the 25th August 1891, and stored in tubes. No. 32, K. T. W., the vaccinifer of the vaccinifer of the child M. E. R., was vaccinated on the 9th November 1891, and was seen by me on the 25th April 1892 when six months old. He is a large healthy-looking child with a clear skin. There are two normal vaccination scars without induration or evidence of undue inflammation; there is no enlargement of axillary or cervical glands, no cutaneous eruption, no condylomata round anus, no sores round mouth. Vaccination is stated by mother and doctor to have been normal and not to have been followed by any eruption. The vesicles healed well and quickly, and have not broken down since.

Vaccinifer.

No. 44, P. B. T., aged seven months, was vaccinated on the 16th November 1891. This child was seen by me on the 25th April 1892. It is typically healthy looking, well nourished, with a clear skin and no eruption on the body except some very slight intertrigo in the groins. There are no condylomata, no soreness round anus or mouth, no running from nose. I am informed with regard to his vaccination that on the eighth day the pocks looked healthy, but the healing of the wounds was delayed. Mr. J. S. thinks that the arm was rubbed, and the scabs certainly were removed and open sores left, though no history of injury could be obtained. The child at this time caught cold, and subsequently suffered from bronchial catarrh, the constitutional disturbance from which may have caused the delay in the healing of the wounds. Vaccination was not followed by any eruption on the body, enlargement of the axillary or other glands, induration of or round the pocks, and as far as I have been able to determine there is no evidence to show that the child is the subject of inherited or acquired syphilis. The mother states that the child is in excellent health.

Co-vaccinees.

Four. Vaccinated on the 23rd November 1891. These children were all seen by me on the 25th April 1892.

No. 65, J. S., aged seven months. A bright, healthy-looking child, well nourished and with clear complexion. There is no eruption on the body of any kind. Vaccination was normal, without undue inflammation and no enlargement of glands. The pocks healed well and quickly, and have not broken down since. There are four healthy scars.

No. 66, B. S., aged nine months. A healthy, well-conditioned child, without any eruption on body except a small patch of eczema on nape of neck. Vaccination was normal, the pocks were completely healed by the fourth week, they did not break down again, and the scars are healthy. There has been no rash and no enlargement of glands.

No. 67, E. G., a large healthy-looking child with a clear skin. Vaccination was normal, the pocks had quite healed in three weeks. There was no excess of inflammation, no rash on the body, and no enlargement of glands.

No. 69, J. W., aged eleven months. Not a robust child, has been small and lacking in vigour since birth; even now at the eleventh month he has no teeth. Vaccination (otherwise normal) was accompanied by some slight excess of inflammation, the two lower pocks coalescing. The vesicles healed well and quickly, and the scars did not subsequently break down. There was no eruption on the body and no enlargement of glands. There are now three healthy-looking scars without induration, no enlargement of glands, no eruption of any sort on the body, but some slight eczema of the face. The mother assures me that the child's general health is better now than it was before vaccination.

Sub-vaccinees.

None. The vesicles were not opened.

[One child, No. 104, J. B., was vaccinated from one of the co-vaccinees of No. 68. He looks healthy, and is said by his mother to be so. Vaccination was normal. The vesicles healed well and quickly, without undue inflammation, rash, or enlargement of axillary glands. There are four normal vaccination scars, no cutaneous eruption, induration of glands, or soreness round anus.]

Course of vaccination and illness.

The child M. E. R., No. 68, was unhealthy almost from birth. When about a week old a measly eruption was noticed by Mrs. B., the midwife, all over its body. She informs me that she considered this at the time to be an evidence of inherited taint. She also informs me that she taxed Mrs. R., the mother, with having "gone wrong." This suspicion was well founded and is admitted by Mrs. R. Up to the date of vaccination the child seems to have shown no further evidence of inherited syphilis, except as I gather from Mr. H. E. G. that it did not develop into a plump, healthy child. There is reason to believe that it had some sores round the nates even when it was vaccinated. Up to the eighth day after vaccination the child seemed in fairly good health; the arm was inspected by Mr. J. S. (the vaccinator), and he noticed nothing abnormal, but did not vaccinate any child from it, or store any of the lymph. The vesicles did not rupture, there was some slight excess of inflammation which speedily subsided, and the arm healed well and quickly.

When seen by Mr. H. E. G. on the 16th December, twenty-three days after vaccination, the scabs were still adherent but apparently healthy, and there was no inflammation, induration, or enlargement of the glands. The child was at this time, Mr. H. E. G. says, "covered with "an eruption exactly like the vaccination pocks, consisting "of umbilicated vesicles specially thick round the neck "and on the legs and feet and round the anus which was "very inflamed and raw looking." The child's general nutrition was much impaired. Mr. H. E. G. informs me that it was a shrivelled child with a dirty, earthy yellow complexion, snuffles and incrustation round nose. He had no doubt (whatever the nature of the eruption might be) that the case was typically one of congenital syphilis. He says, "I fear the statement on the certificate was a "wrong one, the meaning I intended to convey was "'vaccinia,' *i.e.*, a general eruption over the body exactly "like the vaccination pocks occurring in an infant the "subject of congenital syphilis. My object in stating it "in that somewhat clumsy fashion was to hide the word "syphilis as much as possible. I only saw the child when "the rash was fully developed, it had almost entirely gone "at death."

The child continued to waste, and eventually died of exhaustion thirty-eight days after vaccination. During its illness the vaccination scars entirely healed, they did not break down or discharge; they were quite well by the middle of December, three to four weeks after vaccination.

Family history.

Mrs. R., the mother of the child M. E. R., suffered shortly after marriage from a vaginal sore, enlarged glands in the groins, followed two months afterwards by a copious eruption over her body. Before marriage she had not led a chaste life, and was pregnant at the time of marriage. She informs me that she was well aware that her husband communicated disease to her. Her subsequent history gives confirmation (if any were needed) to the supposition that the disease was syphilis. She has been married five and a half years; the child who is the subject of this report is the first who has been born alive. She has been six times pregnant.

The first child was still-born at the ninth month.
" second " " "
" third a miscarriage.
" fourth "
" fifth a child still-born.
" sixth, M. E. R., the subject of this report.

No further evidence is needed to show that the mother was syphilitic; the probability is that she transmitted the disease to her child.

Method of vaccination.

I had no opportunity of seeing Mr. J. S. vaccinate, but he assures me that he is very particular in his methods, and never omits to wipe his lancet carefully, steaming it or washing it in boiling water if by accident he draws any blood in opening a vesicle. He does not, as a rule, have the children's napkins removed so as to inspect nates and groins.

Conclusion.

The evidence in support of the view that the child M. E. R. suffered from syphilis is overwhelming, but there is nothing in the history to warrant the suspicion that it was inoculated at the time of vaccination. The vaccination sores were quite healed at the time when a primary syphilitic sore would first have been likely to show itself, and the eruption had developed, come to maturity, and faded before the date at which a syphilitic eruption would have been likely to appear, supposing the primary infection to have occurred at vaccination. The family history takes the question out of the region of conjecture, and makes it a matter of certainty that the child was born of syphilitic parents and unlikely to escape infection. The eruption appeared at the time when vaccination rashes usually occur, about the fifteenth day, and probably was, as Mr.

H. E. G. supposed, a generalised vaccinia. In this case vaccination does not appear to have been directly the cause of death, it may have acted indirectly as a disturbing cause upon a constitution already debilitated by disease.

THEODORE DYKE ACLAND, M.D.

CASE 110, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of G. P. An inquiry was made into this case by a Medical Inspector of the Local Government Board. The following is an abstract of his report :—

The death of G. P., aged 14 days, the illegitimate child of B. P., on December 15th, 1891, was reported to the Board on December 17th, 1891, by Dr. Y., Medical Officer of the Workhouse. A subsequent letter was addressed to the Board by him on December 29th, 1891, stating that he had notified the death to the Coroner of the district, who did not think an inquest necessary; and that he had consequently certified the death as due to convulsions. Dr. Y., having stated in this letter that "a suggestion has "been publicly made that G. P. died from the effects of "vaccination," Mr. Sweeting was directed to inquire into the circumstances of the case. He reports to the following effect :—

Dr. Y. stated that B. P., the mother of the child, was admitted in labour to the Workhouse on December 1st, 1891, and shortly afterwards, on the same day, was confined. On December 8th he vaccinated the baby with stored lymph in four places on the left arm, the reason for this early performance of vaccination being that the mother intended to take her discharge on December 15th. On visiting the Workhouse on December 10th, the nurse informed Dr. Y. that the baby had had a convulsive seizure that morning, for which she had administered a mustard bath. Dr. Y. ordered the child some castor oil. The vaccination appeared not to be taking then, and the nurse reported that the mother appeared to be neglecting the child's feeding. On inspecting the child's arm on December 15th Dr. Y. found that the vaccination had entirely failed. He did not repeat the operation as the child seemed rather poorly, but gave the mother the vaccination paper ("Notice of requirement") and told her she had better get it done outside, as she was leaving the next day. That same evening (December 15th) he received information from the Matron that G. P. had just been found dead in his cot. He at once proceeded to the Workhouse, and found the child dead. The hands were clenched, the thumbs drawn, the legs flexed on the abdomen; there was some lividity and exudation of frothy mucus from the mouth. Dr. Y. at once informed the Board and the Coroner of the death. The latter replied on December 18th, informing him that he did not consider an inquest necessary. Dr Y. accordingly certified the death as due to "convulsions."

From S. A. P., midwife and nurse in the lying-in ward, Mr. Sweeting learned that B. P. was admitted to the Workhouse on December 1st. She was then in labour, and she gave birth to the baby in less than half an hour. It was an ordinary rapid labour and a male child. This child was vaccinated on December 8th by Dr. Y. in four places on the left arm. On the morning of December 10th he had a convulsion, for which she put him into a mustard bath, and Dr. Y. subsequently administered castor oil. After this convulsion the child seemed to waste away, and the belly became flat. The mother used to say that the child would not suckle, but the nurse observing that he took spoon-food voraciously, herself held the child to the mother's breast, and found that he took well. Some of the patients had, the nurse said, seen the mother give the baby bread and milk from her own basin, instead of suckling him. On December 15th, about 5.30 p.m., the child was found dead by the mother in the cot alongside her bed. Nurse P. was called, and found the child on his back, hands clenched, "dark" about the mouth, forehead, and temples, some blood oozing from the nose.

B. P., the mother of the deceased, a healthy-looking domestic servant, aged 23 years (from Wiltshire), informed Mr. Sweeting that deceased was her second illegitimate child. The former one was born in 1887; but died when 14 months old of bronchitis and inflammation of the lungs. Each child was by a different father. The deceased was not quite a full-time child; she did not expect it until the end of December. She went to the Workhouse in labour on December 1st, and was confined in about 15 minutes time. The baby seemed healthy when born; but got thin, and "fell away" from about the third day after birth. On December 8th, when a week old, the baby was vaccinated in four places on the left arm by Dr. Y.; she did not see it done. On December 10th she was sitting up in bed with the child, when he became black in the face, and clenched his thumbs. She called the nurse, who put the child into a mustard bath; and the doctor subsequently ordered some castor oil. The vaccination did not take at all, except that the arm on December 9th looked a little red at the places where the vaccination had been done. Dr. Y. inspected the arm on December 15th, and found the vaccination had entirely failed; but he would not repeat it, because he said the baby looked poorly. The child had continued to waste and get thinner from about the third day, and on the evening of December 15th she found the baby dead in the cot, half an hour after she had suckled and put him there. His eyes were shut and his hands clenched; but she did not notice anything else. She at once called the nurse.

The mother stated, further, that she did not have much breast milk for the child; and that he had difficulty in taking the breast, so much so that the nurse once had to hold the child to her breast for her. She acknowledged giving him food from her own basin, even when he was quite young, but stoutly maintained that it was only milk, drained off from her bread and milk. B. P. said, finally, that she did not attribute her child's death in any way to vaccination.

Although the vaccination was admittedly unsuccessful in the case under investigation, Mr. Sweeting placed on record the following facts as to the history of the lymph employed. The deceased baby (G. P.) is entered in Dr. Y.'s Workhouse register as having been vaccinated on December 8th from "291 S.," and is entered as inspected on December 15th, and "unsuccessful." "291 S." was a child named F. P., æt. three months, who was successfully vaccinated on November 18th at the public station, and inspected on November 25th. On the latter date a child named M. R., æt. three months, was vaccinated directly (arm to arm) from F. P., and at the same time four tubes were filled with lymph from her vesicles. With lymph from one of these tubes the deceased child was vaccinated at the Workhouse on December 8th. With lymph from another tube a child in the Workhouse, named E. M., who was born on November 28th, was vaccinated, also on December 8th; the other two tubes remained unused. Mr. Sweeting saw the three children F. P., M. R., and E. M., whose vaccination was connected by means of the lymph used with that of the deceased G. P. None of them appeared to have suffered any ill-effects from vaccination which had been normal and satisfactory in each case. The first two presented four quite usual cicatrices, the latter (E. M.) only two.

CASE 111., REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of D. P. W. An inquiry was made into this case by a Medical Inspector of the Local Government Board. The following is an abstract of his report :—

On the 7th January 1892 a letter was received from Mr. T., Coroner, stating that he had commenced an inquiry into the death, at the age of three weeks, of D. P. W., who had been vaccinated when one week old, by Dr. W., Public Vaccinator, and that he had adjourned the inquest for further evidence. Dr. Airy was directed to attend the adjourned inquest, and he reports thereon to the following effect :—

D. P. W. was born (prematurely, at eight months, the mother believes) on the 10th December 1891, at the Union Workhouse, and was vaccinated on December 17th at the Workhouse by Dr. W., Public Vaccinator. The vaccination was done, with an ordinary lancet, in four places on the left arm, with lymph which had been taken in a capillary glass tube, the same morning at the public vaccination station from the arm of a three months old child named K. Dr. Airy found K. to be a plump, healthy child with healthy brothers and sisters, and with four perfectly healthy-looking vaccine scars on the arm.

For the first week the vaccination went favourably. The arm was examined by Dr. W., but the vesicles were not opened, on December 22. On December 23rd (only the thirteenth day from birth) the child was taken out of

the Workhouse by its mother to her home, where she follows the business of dressmaker. She applied cold cream to the arm. The vesicles got broken and became sores. They did not heal in the second week, but grew larger while ulcerating in the centre, so that the vesicular margins of the four sores came into contact, though they did not coalesce so as to form one sore. There was no erysipelas or formation of abscess. The child seemed fretful and ill, and the mother made up a bed for it, in the daytime, near the fire. On January 1st her attention was called to the child by its brother, and she found it was scarcely breathing. She sent her little boy to call in Mr. L. He came at once and found the child dying. It died a few minutes after.

An inquest was held on January 4, at which Mr. L. gave it as his opinion that "the cause of death was "inanition due to premature birth and the subjection of "the child to vaccination when it was not strong enough "to be vaccinated, and that the vaccination had accelerated "the child's death." The inquest was resumed on January 19, when Dr. B. described the results of a post-mortem examination which he had made of the child's body. He said he was certain that the cause of death was primarily due to the condition of the lungs which were in a state of static congestion, sodden and œdematous, but he thought that the presence of such a sore on the arm could not fail to hasten the death of a child in such a condition.

The Jury eventually returned a verdict "that death was "due to congestion of the lungs, accelerated by the sores "on the arm; and that no blame could be attached to "Dr. W., who vaccinated the child."

Dr. W. thought the child was born at the full time, and so did the nurse from the Workhouse who gave evidence at the adjourned inquest. But the mother adhered to her statement that it was an eight months child. The mother herself is a diminutive woman. She was deserted by her husband, and on that account was obliged to go into the Workhouse to be confined. She brought the child out on the thirteenth day after the birth (a week before the usual time), because she had to look after her two elder children for whom a lodging had been taken for a fortnight, away from home, and who then had to be brought home again. On leaving the Workhouse she walked three-quarters of a mile, a friend carrying the baby wrapped in a shawl. She fed the infant at the breast, but she says that she had great difficulty in getting it to take sufficient nourishment. For four days "nothing passed through its body." On the evening of December 31 she gave it a few drops of "tasteless castor oil" from a bottle borrowed from a neighbour. This took effect next day, the day of the child's death.

In addition to the above circumstances of puny development, mal-nutrition, and too early removal from the lying-in ward, Dr. Airy says it must be remembered that the weather at that time (in Christmas week) was severely cold and poisonously foggy. The room in which this poor family lived was draughty and cold. All these conditions must, he points out, have combined to depress the vitality of the child and bring about that state of congestion of the lungs which was the cause of its death.

Case 112, reported to the Commission by the Local Government Board.

Case of A. E. H.: report to the Commission of Dr. Theodore Dyke Acland.

Vaccination. A. E. H., aged four months, was vaccinated on the 2nd December 1891 by Mr. J. P. P., Public Vaccinator.

Death. 10th January 1892.

Certified cause. "Erysipelas attacking vaccination; gangrene."

Certified by. T. G. A., M.D., of —— ——.

Source of lymph. Direct from the arm of H. J. W., of —— ——.

Vaccinifer. A healthy child. Four normal cicatrices, without induration, or any sign of there having been undue inflammation. The mother states that there was no excess of inflammation, no enlargement of glands and no rash. The child has been in good health both before and since vaccination.

Co-vaccinees. Six. Vaccination normal in all.

Sub-vaccinee. One. A. E. M. of —— ——. A miserable child, emaciated and suffering from diarrhœa. The arm presents four reddish scars with minute vesicles on their surface, and one scar from a vesicle which had apparently formed by self-inoculation from the vaccine vesicle. The child's surroundings were filthy, and it is a matter of surprise that any open wound, such as that made by vaccination, should have healed so satisfactorily under such adverse conditions.

Mr. J. P. P., who vaccinated the above children, had taken such pains to investigate the matter (as reported by him to the Commission in his letter dated the 4th February 1892, a copy of which is appended to this report) that I did not consider it necessary to do more than inspect the vaccinifer and sub-vaccinee, and to visit the house of the child who died. I am indebted to Mr. J. P. P. for much valuable information. He had seen Dr. T. G. A. and Mrs. H., the mother of the child A. E. H., with regard to the child's illness and had made inquiries from the Medical Officer of Health. The latter had caused Mrs. H.'s premises to be visited by the Sanitary Inspector with a view to ascertaining whether there was any gross insanitary defect in the locality. In fact Mr. J. P. P. had made a complete inquiry before I made my visit.

Course of vaccine and sub Up to the date of inspection vaccination proceeded normally. The father and mother state that the arm was first noticed to be inflamed on Sunday, the 11th December, two days after the vesicles were opened. The areola is said to have subsided during the second week, and, as far as I was able to ascertain, to have started afresh on or about the 24th December. So far as the parents know the vesicles were never injured and the scabs were not knocked off. They did not consider that anything was seriously wrong until the 24th December when they first took the child to Dr. T. G. A. The arm at that date was much inflamed. The two upper vesicles had coalesced and were covered by one scab. Dr. T. G. A. has no doubt that the child was suffering from erysipelas when he saw it on the 24th December, and inquiry fully confirms his view of the case. The disease continued to progress, and the child became exhausted and finally died.

Treatment of vesicles No application was made to the vesicles except cold water.

Previous history. Said to have been good.

Family history. No facts bearing upon the case could be elicited from father or mother.

General surroundings. Fairly satisfactory. The house was not clean, but there was nothing offensive about it; the back yard was filled with cages and hutches of various pets which were not clean, but, so far as I could ascertain, the child had only been out of the house on three occasions between the time of its vaccination and its death.

Sanitary conditions 1. With regard to the condition of the house itself I have received the following memorandum from Mr. H., the Medical Officer of Health. It must be noted that it refers only to the house and not to the locality:—

"At the time of the Sanitary Inspector's visit (January "30th) the house situated in —— —— was in a 'sanitary "'condition,' *i.e.*, the drains were examined and found to "be trapped. The water supply was good, and of sufficient "quantity, and the premises were clean.

"There was no prevalence of erysipelas in the neighbour-"hood at the time of the death of the child in question."

2. The situation of the house is, as Mr. J. P. P. has pointed out, an extremely unhealthy one; it stands low and is built on land reclaimed from the river and which I should suppose at high water is actually below the level of the river. The house is the last but one in a row abutting on some marshy fields which are cultivated by a market gardener; the ground between the house and the river is largely composed of refuse, and there can, I think, be no question, that under certain conditions of wind the houses abutting upon this land must be liable to any infection that may arise from this refuse, and that any person suffering from an open wound in such a locality would run a more than ordinary risk.

Method of vaccinatio Mr. J. P. P. is a Public Vaccinator of large experience, and seems to take every precaution in the selections of his vaccinifers, the method of his vaccinations, and in refusing to vaccinate unsuitable cases. I have been unable to ascertain any fact that would lead me to suppose that the vaccinator or the lymph was at fault.

Conclusion The child died of erysipelas spreading from the vaccination wounds. Whether the erysipelas was primarily due to vaccination or to some extraneous infection which found access through the vaccination wounds and unconnected with the operation, there is no evidence to show. Mr. J. P. P. is of opinion that the unhealthy conditions of the immediate neighbourhood of the child's home cannot be overlooked as a possible cause of the child's fatal illness, and in this opinion I am in accordance with him.

Theodore Dyke Acland, M.D.

(Copy of letter from Mr. J. P. P.)

DEAR SIR, February 4th, 1892.

Re A. E. H.

I HAVE inquired fully into the above case alleged to have died of "erysipelas attacking vaccination; gangrene," and am now able to make the following report:—

A. E. H., æt. three months, of ——, was vaccinated by me as Public Vaccinator at the vaccination station, ——, on December 2nd, 1891; the vaccinifer being H. J. W., æt. three months, of ——, an opposite neighbour. This child had a typical arm at the time. I have since visited it and find that the vaccination proceeded most regularly without any undue inflammation, and, at the time of my visit, the arm was quite healed and the child a very fine one in perfect health.

At the same time that A. E. H. was vaccinated, and from the same source, viz., H. J. W., the following were also done:—

A. C., æt. fourteen years, of —— (a re-vaccination).
W. J. P., æt. three months, of ——,
A. W. S., æt. three months, of ——,
E. M. K., æt. three months, of ——,
F. B., æt. three months, of ——,
B. F. P., æt. three months, of ——.

All these I have seen and find that the vaccination proceeded quite regularly, without any undue inflammation, and the arms were quite healed at the time of my visit last week.

A. E. H. was brought for inspection on December 9th, 1891. She had four typical vesicles, registered as A. or typical in my register, and I vaccinated from her:—

A. E. M., æt. eleven months, of ——. This child had a typical arm on the eighth day. I visited her last week and find that it went on fairly well afterwards without any undue inflammation, but at the time of my visit the four places were unhealed. This child, however, was rather delicate and the vaccination had been once postponed.

From these facts, all of which can be verified and the children seen, it is clear that no erysipelas was conveyed with the vaccination, and that some local cause in the house or its surroundings must be sought for to account for it.

The case was duly notified under the Infectious Diseases Act, but no inspection was made owing to the death of the Inspector.

—— Road is a dirty street inhabited by poor people, the parents and the house are not particularly clean. The street runs from the —— Road down to —— Marshes, and No. —— is the last house but one on the right-hand side; some 100 yards or so from here is a parish dust-shoot. The marshes themselves are cultivated by a market gardener, and some of the parish refuse is frequently scattered over his fields, and I am informed that complaints have from time to time been made of offensive smells arising from the decomposing animal and vegetable matter.

I think it possible that the erysipelas might be due to some of these insanitary conditions.

I remain, &c.
J. P. P.

Bret Ince, Esq.

CASE 113, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of J. W. P.: report to the Commission of Dr. Theodore Dyke Acland.

J. W. P., aged four months, of ——, was vaccinated on the 3rd December 1891 by Mr. McC., of ——.

17th January 1892.

"General œdema following vaccination."

H. V., M.D., of ——.

Source of lymph.

The vaccinator, Mr. McC., in answer to an inquiry by the Commission, stated: "I keep no record in my books of "vaccinations performed by me as my practice is a ready "money concern in all instances, and cannot even say "whether the child has been to my surgery. This "is all I can say regarding the matter." I have seen Mr. McC., and he declined to give the Commission any assistance. My impression is that his books are so carelessly kept that he has no knowledge as to the source of the lymph used in this case. He stated in conversation that since he had been at —— he had never used anything except calf lymph, but the source of this calf lymph I was unable to ascertain with certainty. He showed me one tube from Dr. Renner, but he says that he does not always obtain his lymph from Dr. Renner, and he will not allow me to state on his authority that the lymph used in this particular instance was calph lymph. Practically I was unable to obtain any reliable information from him.

Not known.

Co-vaccinees.

None.

Sub-vaccinees.

Course of vaccination and illness.

From Mrs. P., the mother of the child J. W. P., I learn that the child was vaccinated on the 3rd December 1891, and that his arm was inspected by Mr. McC. on Thursday, the 10th December. On this day there was nothing visible at the point of inoculation, but the child was so irritable and unwell that two days later, on the 12th December, he was taken to Dr. H. V., who found that there was œdema of the limbs, the cause of which he was unable to determine. Some time between the 12th and 19th December the place of inoculation began to inflame, and by the 19th December (the sixteenth day) an ulcer had begun to form. There is a slight discrepancy between the statements of Dr. H. V. and Mrs. P., the mother of the child J. W. P., which I have not been able to reconcile. Mrs. P. thinks that vaccination was performed in only one place, Dr. H. V. is under the impression that three ulcers formed. However this may be, the point of inoculation had begun to ulcerate by the sixteenth day. There was some surrounding inflammation and a thin discharge (compared by the mother to oil) ran from the wounds. Dr. C. V. describes the sore which he first saw on the 27th December (the twenty-fifth day) as slightly excavated with much surrounding induration. The mother thinks the axillary glands were not indurated; apparently they were not examined by Dr. C. V. The wound did not extend much, but formed a deep unhealthy ulcer which Dr. H. V. suspected to be syphilitic. Two grains of grey powder were given each day after the 12th December. Dr. H. V. states that the ulcer healed but the induration remained, and the child continued to lose ground. It was not until the 11th January that mercury was given by inunction with the definite idea of counteracting a syphilitic infection. Between five and six weeks after vaccination a scaly eruption appeared over the abdomen and buttocks. The mother states that the scales dropped off leaving dark red spots, which eventually deepened in colour, and Dr. H. V. informs me that they had a decidedly coppery tint. The wasting continued and the child emaciated rapidly; no fresh symptoms occurred except diarrhœa just before the child died.

Not known.

Method of vaccination.

Favourable.

General surroundings.

Family history.

The mother is a stout healthy woman who seemed anxious to give me all the information she could. I was unable to detect any circumstances which would lead me to suspect that she had been the subject of syphilis. She had never suffered from sore throat since girlhood and has had no eruption on her body. She had never had any miscarriage. Her first child (by a former marriage), S. J. P., is stated to have died of pulmonary consumption at the age of four and a half months, and to have suffered from "dropsy" (as did also the subject of this report). The child was born at —— on the 6th December 1879, and died on the 8th April 1880; the certified cause of death being "bronchitis and convulsions, one month; "exhaustion." Mrs. P.'s first husband, J. P., is said by Mrs. P. to have died on the 6th October 1880 of consumption at the age of twenty-five. The cause of death is certified by W. R. H., M.D., to have been "pulmonary "tuberculosis, 1 year 6 months; exhaustion." Mrs. P.'s second child (by her second marriage), M. P., was born on the 20th July 1890 and died on the 13th November 1890. She was attended by Dr. M., of ——, and is certified to have died when about four months old of "bron-"chitis." Dr. M. assures me that he never had the least

suspicion that the child was suffering from inherited syphilitic taint. The mother informs me that both these children were fairly healthy during the first weeks of their lives and reasonably well nourished, neither of them had any rash upon their bodies at any time, and I was unable to elicit any information which would lead me to suppose that they were the subject of congenital syphilis, except that they both died in early infancy; but this isolated fact carries very little weight.* Mr. P. informs me that as far as he knows he has never contracted syphilis. He has never had a primary sore or gonorrhœa, and although he does not deny running the risk of contracting the disease, he tells me, I believe honestly, that as far as he knows he has never done so. He is Mrs. P.'s second husband, and the subject of this report is their second child. Taking all the facts into consideration I was not able to satisfy myself that there was adequate reason for supposing that either of the parents had suffered from syphilis.

General considerations.

Three points seem to require special consideration:—

(*a.*) Whether the phenomena which followed vaccination were influenced in any way by the fact that notwithstanding the negative result of my inquiries the child was in fact suffering from an inherited syphilitic taint.

(*b.*) Whether the child suffered from and died in consequence of syphilis inoculated at the time of vaccination or through the vaccination wounds.

(*c.*) Whether the symptoms which were present were the sequelæ of vaccination, uncomplicated by any extraneous contamination.

(*a.*) With regard to the first of these considerations, if the child was suffering from hereditary taint it might account for the appearance of the "scaly rash leaving red marks," "decidedly coppery" in tint which developed itself during the sixth week after vaccination. No sufficient evidence to decide this point could, however, be obtained; and though the family history gives ground for suspicion, the description of the rash is too indefinite for deductions drawn from it to have any real weight. The fact that both the other children of the same mother died early and with symptoms which are not incompatible with their having suffered from inherited syphilis, is equally indefinite since there is reason to suppose that both of them died from well-ascertained causes. The first child is believed by Mrs. P. to have inherited a tubercular tendency, and the certificate of death is not incompatible with its having died of tubercular disease. The second child was attended by a well-qualified medical practitioner who did not even suspect the presence of any syphilitic taint, and who believes that the child died of some catarrhal affection of the lungs. He was inclined to attribute the œdema of the limbs from which the child suffered before it died to some congenital affection of the heart, but on what grounds I could not ascertain.

(*b.*) The second point for consideration is whether the symptoms in this case were such as might have developed in any child suffering from *inoculated* syphilis. At first sight there are some points which seem to suggest that this was so, namely:—

(i.) The non-development of the vaccination vesicle and the delay in the appearance of any symptoms at the point of inoculation.

(ii.) The induration round the point of inoculation followed by ulceration.

(iii.) The occurrence some weeks after inoculation of a scaly eruption leaving a dusky red discolouration of the skin.

(iv.) The grave constitutional disturbance, as evidenced by the rapid wasting.

Even if calf lymph were used, there is no certainty that a specific taint was not conveyed by a lancet which had previously been used to vaccinate a syphilitic child; since it is possible that on the same day a syphilitic child may have been vaccinated immediately before J. W. P., and that the lancet was not properly disinfected between the two vaccinations. As to the possibility of infection having occurred at the time of vaccination, I am of opinion, from the condition of Mr. McC.'s surgery, that his vaccinations are not likely to be carried on with strict attention to the precautions which are necessary to obviate any possibility of risk.

Further, it is possible, though unlikely, that the wound on the arm was contaminated from some other source after vaccination. There is, however, no evidence on either of these points, and if the contamination of the wound took place later than the day of vaccination, the length of the primary incubation period would be thereby diminished, and it would be still more improbable that the eruption which eventually developed was syphilitic.

Against the view that this was a case of inoculated syphilis may be urged:

(i.) The shortness of the inculation period.

(ii.) The amount and early appearance of inflammation round the points of inoculation, and the absence of typical induration.

(iii.) The early appearance of ulceration.

(iv.) The extent and character of the ulceration.

(v.) The amount of discharge and absence of scab.

(vi.) The absence of indurated glands in axilla.

(vii.) The early appearance of the "primary" rash.

(viii.) The early appearance of the "coppery" rash.

(ix.) The absence of nodes or mucous tubercles.

A comparative table of these symptoms is given below.

(*c.*) The evidence on the last point, viz., whether the symptoms which occurred were the result of vaccination only, is incomplete owing to the fact that Mr. McC. is unable or unwilling to lay before the Commission such information as he may possess as to the source of lymph and the manner in which he performs his vaccinations; and, in the absence of information as to the source of lymph or method of vaccination, any conclusion must be unsatisfactory, as it involves the assumption that the lymph came from a source uncontaminated with syphilis, and that no contamination occurred during or immediately after the act of vaccination.

Summary.

The most important facts of the case seem to be:

(i.) That the ulcer was well formed at a date at which a vaccinal chancre would probably not yet have begun to form (*see* Fournier, Leçons sur la Syphilis Vaccinale, page 123).

(ii.) That the ulcer was distinctly inflammatory and differed in essential points from a true primary vaccino-syphilitic sore.

(iii.) That the second eruption appeared some three weeks earlier than secondary syphilitic rashes may be expected to appear after inoculation at the time of vaccination. (This date is given by Fournier as *at least* nine weeks, by Hutchinson as forty-two to sixty-three days.)

(iv.) That the character of the eruption alone is not sufficient to outweigh the above objections, since a macular eruption truly coppery in tint may follow vaccinal ulceration, and the description of the rash in this case is very indefinite (Fournier, page 130).

(v.) That the mother who suckled the child up to within three weeks of its death had no sore on her nipple or other evidence of syphilitic infection.

Conclusion.

Taking all the above points into consideration, there are grounds for believing that the case is an unusual one of vaccinal ulceration, and that syphilis was not inoculated at the time of vaccination, and the preponderance of evidence is in favour of the case having been one of a non-syphilitic character. In view of the element of uncertainty in the case it is greatly to be regretted that it is not possible to trace the origin of the lymph.

* Since writing the above Mrs. P. has been confined of another child. When this child was two months old (19th January 1893) Dr. H. V. informed me that it presented no evidence of syphilis.—T. D. A.

Table 1.

Chronological statement of the case of J. W. P. [*The dates which are printed in heavy type are fixed with certainty by Dr. H. V.'s day-book, the entries having been made at the time.*]

Date.	Days after Vaccination.	—
1891.		
3 December - -	—	Vaccination by Mr. McC.
10 „ - -	7	Inspection by Mr. McC. No vesicle formed. Child irritable.
12 „ - -	9	First seen by Dr. H. V. No vesicle or ulceration on arm. Limbs swollen and waxy looking. Red rash on buttocks, and rash with some exudation on the neck and scalp. Pulv. Hyd. c. Creta given as alterative twice a day.
17 „ - -	14	Arm began to inflame between these two dates. By the latter, the 19th December, ulceration had probably commenced.
19 „ - -	16	
27 „ - -	24	Seen by Dr. C. V. A well-marked ulcer at the point of inoculation with an oily discharge. The condition of the glands not noted.
1892.		
2 January - -	30	The ulcer first seen by Dr. H. V. There was considerable surrounding inflammation, and the ulcer was unhealthy looking and excavated. Condition of glands not noted.
4 „ - -	32	Mercurial treatment continued.
8 „ - -	36	Mercurial treatment continued. Condition of sores improving.
11 „ - -	39	A coppery rash first noticed by Dr. H. V. on abdomen. This had not been present on the 8th January. Child losing flesh rapidly. Mercurial inunction commenced on the supposition that the case was one of syphilis.
17 „ - -	45	Death.

Table 2.

Symptoms and sequence of events in the case of J. W. P. compared with those given by Professor Fournier as characteristic of vaccinal syphilis and vaccinal ulceration.

—	*J. W. P.*	*Vaccinal Ulceration.*	*Vaccinal Chancre.*
The ulcer:			
Incubation - -	14 to 16 days - -	12 to 15 days - - -	Generally upwards of three weeks, never less than 15 days.
Development -	Ulceration well marked by 16th day, at its height on 25th day.	Ulceration fully developed after 21st day.	About 21st day ulceration in its earliest development, or not yet commenced.
Vesicles affected -	All the vesicles (three) affected according to Dr. H. V.; only one ulcer according to Mrs. P., the mother.	As a rule all vesicles affected -	As a rule all vesicles not affected. Vaccination vesicles often abort.
Inflammation -	Considerable - - -	Generally a prominent symptom.	As a rule slight.
Loss of substance -	Great; ulcer deep and excavated.	Generally deeply excavated -	Loss of substance superficial, with rare exceptions. Much less excavated than a vaccinal ulcer. [Compare a case which was "probably on the verge of phagædena," *Illustrations of Clinical Surgery*, Jonathan Hutchinson, 1878, at pages 126 and 131.]
Discharge - -	Considerable; not drying into scabs.	Considerable; not drying into scabs.	Scanty or absent; nearly always forming scabs.
Edges - - -	Punched out - - -	Punched out, perpendicular, irregular.	Not punched out, sloping to floor.
Bottom - - -	Unhealthy looking - -	Uneven, unhealthy looking, sometimes sloughy.	Smooth, even.
Base - - -	Inflammatory induration -	Inflammatory induration -	Induration circumscribed, elastic, parchment-like.
Areola - - -	- - - - -	Extensive; diffuse inflammation.	Very slight, often inappreciable.
Glands - - -	Not noticed to be enlarged -	Either no reaction or simple inflammation.	Enlargement always present; indolent non-inflammatory induration.
		Secondary vaccinal eruptions.	*Eruptions of vaccinal syphilis.*
The eruption:			
Development -	First rash: red with some exudation noticed on 10th day after vaccination. Second rash: scaly, ? coppery, about 40th day.	First appear between the 9th and 15th days; always contemporaneous with vaccination.	At the earliest first appear 63 to 70 days *after* vaccination. [In Mr. Hutchinson's cases it varies from 42 to 63 days in untreated cases, and from five to seven months in those under mercurial treatment. *Loc. cit.*, page 133.]
Relation to primary sore.	Not preceded by a typical vaccinal chancre.	Not preceded by a typical vaccinal chancre.	Always preceded by a chancre at the point of vaccination.
Clinical characters -	No mucous tubercles - -	Of ordinary types (roseola, miliaria, bullæ, etc.); not lasting. No mucous tubercles.	Characteristic syphilides; persistent. Mucous tubercles often present.

Table 3.

Symptoms and sequence of events in the case of J. W. P. compared with those given by Professor Fournier as characteristic of vaccinal syphilis and vaccination in a case of hereditary syphilis.

——	*J. W. P.*	*Vaccinal syphilis.*	*Vaccination in a case of hereditary syphilis.*
Evolution	Incubation 2 to 2½ weeks	Incubation hardly ever less than 3 weeks.	No constant incubation period.
	Chancre not present	Chancre at point of inoculation	Chancre not present at point of inoculation.
	Second incubation? 3½ weeks	Second incubation about 6 weeks	No regular second incubation period; the signs of syphilis develop irregularly and independently of vaccination.
	Rash?	Second rash true syphilides	
Glandular enlargement	None noticed	Always present; indolent; non-inflammatory.	Irregular.
Generalization	If any by the 40th day	Never before the 63rd day. [See note in Table 2 above, as to Mr. Hutchinson's cases.]	Quite independent of vaccination.
Aspect	Not noted to be syphilitic	-	May be suggestive of syphilis.
Constitutional evidence	None	None	Often present; snuffles, cranio tubes, pemphigus, etc.
Family history	Not characteristic	-	History of parents, especially of mother, relation to confinements, etc., gives confirmatory evidence.

THEODORE DYKE ACLAND, M.D.

CASE 114, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of A. E. H. An inquiry was made into this case by a Medical Inspector of the Local Government Board. The following is an abstract of his report:

Local registrar's register contains entry of death, on the 3rd February 1892, of A. E. H., aged four months, certified by Mr. C. as from "œdema, following blood-poisoning "consequent on vaccination." Dr. Bruce Low was directed to investigate this case, and reports to the following effect:

A. E. H. was vaccinated when three months old by Dr. M., the Public Vaccinator, at his station on January 18th, 1892. The infant died on February 3rd, and his death was certified by Mr. C.

Mrs. H., the mother of the deceased, says that he seemed quite well on January 18th when she took him to be vaccinated. On January 22nd the baby seemed "ill of himself." Next day, January 23rd, he had convulsions and she sent for Mr. C., who ordered mustard to be applied to the chest and back, and ice to the head. On January 25th (the eighth day of the vaccination) three vesicles out of the four had risen, and there was some redness round them. This inflammation gradually increased and extended up and down the vaccinated (right) arm; it ultimately spread to the chest, neck and scalp, and to the opposite arm. The right hand became swollen and discoloured. Bread poultices and fomentations were applied to the vaccination places on January 25th, and later powdered starch was sprinkled on the reddened skin. On January 31st diarrhœa set in, and the child died exhausted on February 3rd, the seventeenth day of the vaccination.

So far as Mrs. H. knows, no injury was inflicted on the vesicles by rubbing, or by careless nursing. The sleeve of the baby's white frock was looped up. No shield was worn. The child was not out of doors after the day of its vaccination; owing to its illness it was not taken back for inspection. At first Mrs. H. said there had been no other illness in the house up to her baby's death, but later on she remembered that during the week the baby was vaccinated her next youngest child, a girl aged three years, became suddenly ill, but recovered in "about two days." The symptoms, so far as she knows, were "like a severe cold," but owing to the baby's illness she took little notice of this girl.

On February 16th, thirteen days after the infant's death just related, her youngest boy, aged 4½ years, was suddenly taken ill with vomiting and great drowsiness. He had been to school the previous day, and seemed then in his usual health. He made no complaint of headache. His mother, judging by his "heavy" look that he was "starting with measles," put him to bed and gave him a small white purgative powder (probably calomel) which she purchased from a chemist. Two days later she administered a second powder, but as the boy continued hot and feverish she sent for Mr. C. on February 20th. The leading feature of the boy's illness, his mother says, was pain in the abdomen, for which poultices and fomentations were prescribed by the doctor. He had no cough or shortness of breath till shortly before his death on March 2nd. On February 26th the motions, which had been costive up to now and dark in colour, became rather looser, but were never liquid; she described them as semi-solid and of a bright orange yellow colour. The boy remained quite conscious till a few hours before his death. Mr. C. certified his death as due to "typhoid fever." Mrs. H. says that she and the doctor looked every day for "spots," but never found any. On speaking to Mr. C. about the case he admitted he was in doubt for some time as to the diagnosis, but that when the "diarrhœa" set in he had then no doubt as to the nature of the illness. He says the stools were "characteristic" of typhoid fever.

The H. family now consists of six children whose ages range from 17 to 3. The two elder boys go to work, three others go to school, and one remains at home (the girl aged 3 already referred to). Besides the family there is one lodger, an elderly woman who gains a living by charing. There are six rooms in the house, which was only moderately clean at the time of Dr. Low's visit. The W.C. is outside in the yard. The pipes were, on March 9th, frozen, and in consequence the pan of the closet was dirty, but Mrs. H. assured Dr. Low that the flushing arrangements had not before been out of order. The sink pipe delivered over a trapped gulley. The dustbin was empty and was away from the house. The milk used in this family was condensed milk, viz., "the Home and Colonial brand," but the baby had been fed altogether from the breast.

In reference to this reported fever case Dr. Low wrote to the Medical Officer of Health, who replied that no other case of typhoid fever, except the one above, has been recorded in his district during the present year, "neither has "my attention been called to the existence of any disease "of a septic nature taking place in the district." He adds that when the typhoid case was notified he took steps to ascertain the cause. "The drains of the house were "tested, but no defect was found. The sink pipe is dis-"connected, and good ventilation has been provided in "connexion with the air space under the floors. The "sanitary arrangements of the house may be described as "in good condition. The sanitary arrangements at the "Board School at which the boy attended were not so "satisfactory. The closets are of the iron trough descrip-"tion, and at the time of the inspector's visit the smell "issuing from them was of a marked character."

Mr. C., who attended both children, states that he could not trace any connexion between the two fatal attacks in the H. family. His opinion is that the boy aged 4½ probably contracted his malady while playing near a sewer ventilator or open drain. As to the baby's illness he said that when he first saw the vaccination on Saturday, January 23rd (the sixth day of the operation), the redness then observed round each place was distinct and separate; in no case did it coalesce with that around an adjoining vesicle; but that on Monday the redness had become diffuse. His opinion is that the child's dentition had an injurious effect on the course of the vaccination, and that this result could hardly have been foreseen by anyone performing the vaccination.

From Dr. M.'s register Dr. Low found that A. E. H. was vaccinated direct, along with one other child named R., from the arm of an infant W. W. Dr. Low saw this vaccinifer, a plump, healthy-looking child. Mrs. W. stated that the arm was never inflamed, and the infant made a good recovery; it did not give her any trouble or uneasiness at any time.

Dr. M. states that on January 18th Mrs. H. and Mrs. R., the mothers of the two children vaccinated from W. W., were late in coming to the station; in fact, nearly every one had gone. He had, however, kept Mrs. W. and her baby waiting, as the latter's arm seemed such a good one from which to vaccinate. On the eighth day the child R. was brought back for inspection, and nothing but normal result was noted. Dr. Low during his inquiry called at the R.'s house, and from the baby's grandmother learned that the arm was free from inflammation till the ninth day. She also told Dr. Low that she had applied a cold-water rag to the arm to prevent inflammation, and that this rag dried and stuck fast to the arm. After this, she said, the arm looked red and somewhat swollen. She took the child on January 30th to a dispensary in the neighbourhood where she obtained a lotion for the arm. The grandmother further stated that the redness had completely gone by the end of a week from its first appearance, and that the child's arm had altogether healed within four weeks after its vaccination. The child's mother, Mrs. R., goes out to work daily, and the baby had been left with its grandmother, or with other persons, to nurse.

From Dr. M.'s register Dr. Bruce Low also found that on January 18th no fewer than 29 infants were vaccinated, and 20 others inspected by him at his station. Dr. M. stated that he seldom vaccinates more than five children from the same vaccinifer, but in the case of H. there was, as has already been stated, only one co-vaccinee, since it was late in the day when the two children were brought. Dr. Bruce Low succeeded in tracing 20 of the 29 infants vaccinated on 18th January, and was assured by Dr. M. that the remaining nine had all presented none but normal appearances on their arms when he inspected them on January 25th. Of the 20 cases visited, Dr. Bruce Low found that, with three exceptions, all had done well and had passed through normal vaccination without any trouble at all. The three exceptions were: (1) the child H., whose case is now in question; (2) the child R., who had some erythema of the vaccinated arm subsequent to removal therefrom of a rag which had stuck to it, to which reference has already been made; and (3) a child named G. A. S.* (vaccinated from a source different from that used for H. and R.), who was ill when Dr. Bruce Low called, and who has since died, and upon whose case he has separately reported.

Dr. Bruce Low also saw a number of children who had been vaccinated on January 11th, and some vaccinated on January 25th, as well as others done at a later date. In none of these was there any history of illness arising from the vaccination, which in each instance had healed within the usual period. He attended at Dr. M.'s station on March 14th, and saw with him 13 cases vaccinated on the previous Monday, and was present when he vaccinated a number of fresh cases (about 20). He came to the conclusion that Dr. M. was a careful vaccinator. He uses a bright lancet and cleanses it between each operation. He stated he has vaccinated for the last 30 years without a mishap till the present case.

Dr. Bruce Low made special inquiries to find out if the mustard applied to A. E. H.'s back and chest on January 23rd could have unwittingly been brought in contact with the vaccine vesicles, and to find out if during the convulsions the arm had been injured in any way. But on neither point did he get any evidence.

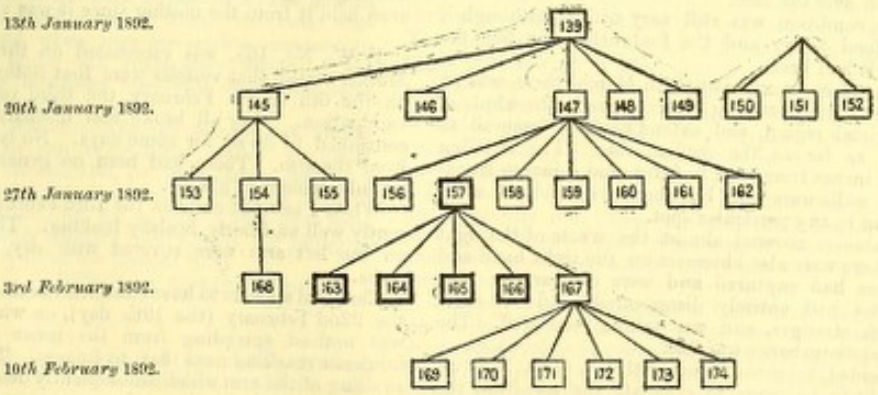
Case 115 [Series] reported to the Commission by Mr. J. H. Lynn.

Case of B. S. and others: report to the Commission of Dr. Theodore Dyke Acland.

General statement.

On the 3rd February 1892, Mr. C. L., Public Vaccinator for the —— District of the —— Union, vaccinated six children at his surgery, which is used as the public vaccination station. Five of these children were vaccinated directly from the arm of a child A. S., who was No. 157 in Mr. C. L.'s register. This child subsequently suffered from erysipelas, as did also four of the children to whom A. S. acted as vaccinifer. One of these has since died; one was, on the 12th March, in a very critical condition; one had an axillary abscess; and one had entirely recovered. In one vaccination was normal. The sixth child, vaccinated from a different source, has not suffered in any way. A detailed statement of these cases is given below, with some general considerations as to the pedigree of the lymph, together with the results observed in the vaccinations performed during the two weeks preceding and the week following the day on which the above-mentioned six cases were vaccinated. The marginal dates, where dates alone are given, refer to the days on which I visited ——, viz., the 12th, 13th, and 17th February, and the 12th and 13th March 1892. For convenience a diagram is given showing the connexion of the cases vaccinated at Mr. C. L.'s surgery on the 13th, 20th, and 27th January, and the 3rd and 10th February 1892:—

Cases vaccinated on the—



The five cases vaccinated from A. S. were:—

1. B. S. No. 163 in register.
2. F. H. ,, 164 ,,
3. T. W. ,, 165 ,,
4. M. H. ,, 166 ,,
5. I. C. ,, 167 ,,

The sixth case vaccinated on that day was F. C., No. 168 in register, vaccinated from C. H., No. 154 in register.

(1.) *B. S., No. 163.*

B. S., No. 163, aged three months, of —— ——, was vaccinated on the 3rd February 1892 by Mr. C. L., Public Vaccinator, about 2 p.m., in four places.

Course of vaccination and illness.

Mother states that about 16 hours after vaccination, redness was noticed above the points of inoculation reaching towards the shoulder. It is not known at what precise

* *Case 125. An abstract of Dr. Bruce Low's report to the Local Government Board on that case is given on page 302.*

hour the redness first showed itself, since the arm was not seen until the parents got up in the morning. The child was then distinctly fretful. The redness spread with great rapidity down the arm, and reached the hand the same day. The vesicles were small up to the eighth day (10th February) at which date bullæ formed round the points of inoculation; they have continued to form, breaking, discharging, and partially drying up.

Condition on tenth day, Feb. 12th. On Friday (12th February) when the child was first seen by me there were four unhealthy vesicles. Round the two upper ones were several bullæ containing turbid fluid; round the lower and inner one there was the same condition in a less degree. The outer one was the only vesicle covered with a crust, it was dark, adherent, and depressed. The vesicles were discharging a considerable amount of fluid, and the arm was mottled and swollen, though in a less degree than the hands, which pitted deeply on pressure.

A well-marked erysipelatous blush spread down the legs, ending in a sharp well-defined margin just below the right patella. The edge was raised, vivid red, the redness disappearing on pressure to a considerable extent. The blush extended over the head, but was ill-defined.

I was unable to examine the body, as the child was so ill, that I did not consider it desirable to have it undressed. The temperature in the axilla was 100·8. It was in a state of collapse, lying with its eyes half closed, taking little notice of surrounding objects, and constantly uttering a feeble cry. There was no great enlargement of axillary glands, and no sign of suppuration.

Feb. 13th. The next day (13th February) the child's general condition was slightly better; many of the bullæ which had formed round the vesicles were broken and discharging. There was a well-defined margin to the erysipelatous blush below the left nipple, other margins at the nape of the neck, on the left buttock, and over the middle of the right lower leg. Over the other parts it was badly defined and too indefinite to be accurately marked out. The buttocks and scrotum were raw, and weeping copiously, but owing to the collapsed condition of the child, it had not been kept properly clean, and discharges and evacuations, no doubt, unneccessarily kept up the irritation of these parts. The child had not been washed for 48 hours, and no application of any kind had been made to the affected parts. I was unable to detect any sign of pneumonia, and the gastro-intestinal disturbance which was present was not more than might have been expected from the general condition of the child.

The mother stated that she had not interfered with the wound; that she did not attempt to wipe off any of the lymph; that she used no shield, and had made no application of any kind to the vesicles, except cold water after the arm had begun to inflame. The sleeve, which was of white cotton, had evidently irritated the vesicles, but very slightly so, and did not touch the only scab which formed.

15th day, Feb. 17th. Three of the vaccination wounds had coalesced, and were covered with one large crust. The fourth was covered with a dark depressed scab. The œdema of the left hand was less, but the erysipelas had spread, its margin being situated over the lower third of the left leg. There was considerable œdema of the right eyelids, and the eye was in consequence partially closed. There was a faint erysipelatous blush over the face.

The child's condition was still very critical, although it was taking food better, and the fontanelle was less depressed than it had been.

March 12th. At the time of my next visit (12th March) there was an enormous fluctuating swelling covering nearly the whole of the right parietal region, and extending from forehead to occiput and as far as the median line. The swelling measured 4½ inches from back to front, and 4 inches transversely; the walls were thin, but the abscess did not seem to be pointing in any particular spot.

Another abscess covered almost the whole of the right scapula. There were also abscesses on the right hand and elbow. These had ruptured and were discharging pus. The erysipelas had entirely disappeared, and the child seemed much stronger, and was taking food well. The constitutional disturbance was less.

Subsequent history, March 13th. It was decided, in consultation with Mr. C. L., that an attempt ought to be made to evacuate the pus from the larger abscess. The child was therefore admitted into the —— —— Hospital, under the care of Mr. B., who opened it and let out 8 ozs. of sweet-smelling pus mixed with blood.

General surroundings. There are no grounds for supposing that the erysipelas in this case was due primarily to the local conditions of the child's home. I was unable to find any obvious source of danger in the sanitary condition of the cottage, which, though poor and not over clean, on the whole reflected great credit on the mother, who for many days and at least two entire nights had been, at the time of my first visit, wholly devoted to the care of her child. The child when first seen had not been kept very clean, but this was due to the mother's belief that he was too ill to be moved.

The dwelling-rooms consist of one large room on the ground floor opening to the outer air, and two bedrooms upstairs, not communicating with one another, and leading directly by a staircase into the dwelling-room. There was no offensive smell of any kind to be detected. There is no drainage in the house; the sink is in an outhouse entirely separated from the dwelling-room. The closet is beyond and, communicating directly with the cesspit, and although unpleasant, it ventilates freely into the open air, and is at some yards' distance from the dwelling itself. The child had not been into its immediate vicinity at all. There is a small piece of garden, at the end of which is a fowl run, but there is no offensive smell from it.

Family history. There are four other children. They look well and bright, and the mother says that they are so. There has been no infectious disease in the house, so far as they know. The father who had been laid up for three weeks with influenza was just recovering. The mother says that up to the time that the child was vaccinated she was well, but has since been knocked up with nursing.

(2.) F. H., No. 164. Course of vaccination and illness. F. H., No. 164, was vaccinated on the 3rd February. Mother states that nothing abnormal was noticed until five days later, when the arm was first seen to be inflamed. The inflammation extended down the arm and to trunk, gradually fading away as it extended.

Feb. 15th. On the 10th day (15th February) three of the vesicles were covered with thick yellow crusts; and there was a copious purulent discharge from beneath them. One of the pocks seemed comparatively healthy. The arm was œdemateous but not inflamed, and there was no blush round or extending from the vesicles.

There was no eruption on the legs or on the chest or abdomen, but on the back, extending down to the level of the tenth dorsal spine, there was erysipelas with a well-defined raised margin. The child was evidently ill, feeble, and exhausted. The mother said that she had made no application to the arm except cold water, which was ordered by the doctor; no shield was used and the vesicles were not opened.

March 12th. When I saw the child again on this date she had quite recovered and looked well. There was no sign of erysipelas, and she had four normal scars at the points of inoculation.

Family history. F. H. is the 15th child, of whom seven only survive, the rest have died young, during the period of first dentition, but none of them under the age of nine months. In all, so far as is known, vaccination has pursued a normal course. The mother is a stout, strong-looking woman. The father a miserable, prematurely old-looking man.

General surroundings. The cottage is filthy and miserably poor, nothing clean and nothing in order. The only probable source of contamination which I was able to discover, except the filthy surroundings, was that there was a young woman in the house who had lost three fingers through an accident. These have recently been amputated, and there has been some discharge from the hand, which has not, however, been offensive, and when I saw it, the hand was well and carefully bandaged. In addition, she denies ever having had anything to do for the child, and says she has not even held it from the mother since it was vaccinated.

(3.) T. W., No. 165. Course of vaccination and illness. T. W., No. 165, was vaccinated on the 3rd February. Mother states that vesicles were first noticed to be formed on the 6th or 8th February, the third or fifth day after vaccination. They all broke and discharged matter, and continued to do so for some days. No lymph was taken from the arm. There had been no general eruption and no enlargement of glands.

Feb. 13th. When I saw the child on the 13th February he was apparently well and fairly healthy looking. The four vesicles on the left arm were covered with dry, dark, adherent scabs.

The child appears to have continued in this condition until the 22nd February (the 19th day), on which day a blush was noticed spreading from the inner condyle of the humerus reaching next day to fingers. There was great swelling of the arm which subsequently desquamated. The inflammation, the mother informs me, spread to the leg, but not to the body nor to the other arm. The vesicles were not known to have been injured nor to have any injurious application made to them.

March 12th. At this date there was a considerable abscess on the axilla, but the four vesicles had cicatrised and presented four healthy-looking scars. The child was at this time suffering from bronchial catarrh.

April 2nd. The child at this date was well and the abscess healed.

The cottage was poor and only tolerably clean, but there were no obvious sanitary defects.

M. H., No. 166, was vaccinated on the 3rd February. The mother says at *two*, Mr. C. L. at *three* or *four* o'clock. The hour is so far of importance from the fact that about eight in the evening the mother states that she noticed a distinct redness upon the shoulder. This gradually extended across the back and chest and down the extremities, the blush fading in one place as it increased in another.

At the time of my first visit (13th February) there was œdema of the right arm, and an erythematous blush extending over both legs, which were hot, swollen, and painful. The mother said that the face and head had been much swollen, but were less so than they were. The vaccinated arm was not at that time swollen. The four vesicles looked fairly healthy, and were not broken or discharging, nor were they covered with crusts; but looked as if they had pursued a normal course. There was not then much areola, and, as far as I was able to ascertain, there was no enlargement of the axillary glands, and no sign of suppuration, but the arm was so painful that I did not consider it desirable to move it. Round the buttocks and scrotum there was a brilliant scarlet eruption with much vesication. This was partly due to want of strict attention to cleanliness, but partly also to the fact that the erysipelas had spread down both extremities. The vesicles had not been opened, in fact the child was not taken back for inspection. As soon as it was ill the mother called in Mr. I. P., of ——, who had been attending it since. No application had been made to the arm or body, except flour and cream, which latter is said to have been applied under medical advice.

The child's condition rapidly became worse, and at the date of my second visit (17th February) the head was covered with vesicular eruption, and over the occipital region there was an inflammatory mass, about an inch and a half in diameter, over which the skin was tense, red, and shiny, but I was unable to detect any fluctuation. There was a similar condition on the back of the right hand, which was very œdematous, but here, also, I was unable to detect the presence of pus. The right foot was also much swollen and œdematous. The redness of the cutaneous erysipelas had faded, but the child was extremely feeble, and was taking its food badly. The breathing was hurried, and there was a constant cough. Hope of recovery was evidently slight. The subsequent history is given in the annexed letter from Mr. I. P.:—

DEAR SIR, March 10th, 1892.

I AM most pleased to give you any information I can about the child M. H.

The erysipelas, after running all over the body and legs, gradually got better and faded away four or five days after your last visit. About the 14th an attack of bronchitis came on which continued about five or six days. On the morning of the 21st the child seemed wonderfully better and brighter, had taken food well, and appeared to be on a fair way to recovery, but the same evening was seized with vomiting and purging, which continued most of the next day, and from which it gradually sank, and died on the 23rd.

The puffy swelling at the back of the hand, and œdema of right hand, continued in much about the same condition until the 22nd, when they perceptibly decreased in redness and size under the eliminative action of the diarrhœa, but both swellings were still discernible after death, as also a slight œdema of feet.

The pock marks were not inflamed during any of the time, but seemed to run their usual course, gradually dried, and fell off on the 21st, two days before death. I have no recollection of the deceased child having been ill previous to vaccination, but for a long time I have been attending the two older children from rickets, the youngest of the two being very ill at the present time.

Believe me, faithfully yours,
I. P.

On receipt of the information of the child's death I telegraphed to Mr. I. P. to ask whether it would be possible to make a post-mortem examination, and was informed that if *necessary* the parents would permit it. As I did not consider it was *necessary* in order to ascertain the case of the child's death, which Mr. I. P. agreed with me, was due to the sequelæ of erysipelas, however it may have originated, I decided not to give the parents this additional pain, and complied with their expressed wish that an autopsy should not be made.

I was unable to discover anything in the condition of the house likely to have originated or aggravated the erysipelas from which the child died; its general surroundings were good. The sanitary arrangements were those usually found in similar houses, the sink and washhouse being entirely disconnected from the living room, both opening directly into the open air. No one in the house had been ill in any way, and the other three children were well and had been so for some time past.

I. C., No. 167, was vaccinated on the 3rd February. The arm was inspected on the eighth day and the vesicles found to be normal. Six children were vaccinated directly from this child. (5.) *I. C. No. 167. Course of vaccination.*

At the date of my visit on the 13th February no abnormal symptoms had been noticed; the child had had no rash; there had been no excess of inflammation round the vesicles, and the general health had not been disturbed, and the vesicles were beginning to dry up (10th day).

On the 12th March I found three healthy-looking cicatrices. The fourth vesicle was still covered with an adherent scab. The child had continued well from the time of vaccination. *March 12th.*

F. C., No. 168, was vaccinated on the 3rd February, and was the only other child vaccinated at Mr. C. L.'s surgery on that day. The lymph for this vaccination was obtained direct from the arm of C. H., No. 154. In both cases vaccination was normal. When seen by me they were quite well, with normal scars. There was no history of any general eruption, enlarged axillary glands, or excessive inflammation round vesicles. (6.) *F. C., No. 168.*

The children (Nos. 163–167) whose cases are reported above were vaccinated directly from the arm of A. S., No. 157, aged 3½ months, who was vaccinated on the 29th January. *A. S., No. 157, vaccinifer to the five above-mentioned children.*

According to Mr. C. L., the vaccination pursued a normal course. He states that at the time he took the lymph there was no undue inflammation round the vesicles. Mrs. S., the mother of the child, however, says that the areola was as large round as a penny on the eighth day. *Course of vaccination.*

When I first saw the child, on the 13th February, I found three large healthy-looking cicatrices and one scab, from below which there was a slight discharge. This vesicle had evidently been irritated by the sleeve. *Feb. 13th.*

The child is said to have been healthy up to the time of his vaccination, but he looked delicate and by no means healthy. He was anæmic, poorly nourished, and with depressed fontanelle.

When seen for the *second* time on the same day, the 13th February, there was a suspicious-looking blush on the top of the shoulder above the vaccination cicatrices. This blush first appeared between the hours of 10 and 12, on the 13th February, 10 days after the vesicles were opened, and 17 days after vaccination. The child had been fretful the evening before, but Mrs. S. assured me that she had noticed nothing wrong with the arm until the time stated. The blush rapidly spread down the arm, and by the next day extended from shoulder to elbow. *Course of illness.*

By the 17th February the redness had nearly disappeared; but the mother stated that it had extended with a distinct margin; and it was evident from the condition of the arm that some acute inflammatory condition was subsiding. The forearm and hand were œdematous, as was also the upper arm, though in a less degree. *Feb. 17th.*

There was no general eruption on the body, and the axillary glands were not enlarged. The child's general condition was feeble, and its fontanelle was much depressed. No application has been made to the vesicles except fresh cream.

On the date of my last visit, on the 12th March, the child was practically well. There were four fairly healthy vaccination scars without undue irregularity or depression. There was a little eczema behind the right ear, but nowhere else. *March 12th.*

It will be seen from the above that the diffuse inflammation of A. S.'s arm did not commence until 10 days after the vesicles had been opened, so that, although the mother states that the arm was unduly inflamed when the children Nos. 163–167 were vaccinated from it on the 3rd February, it is possible that the erysipelas originated at a date subsequent to the 3rd February, and had no relation to the cases of erysipelas which occurred in the children vaccinated from him. This point will be considered more fully later. *Late appearance of the erysipelas.*

The S.'s cottage afforded ample opportunities for the infection of an open wound. Both cottage and child were dirty and ill-kept, and when I first discovered the blush round the wounds I found the child lying completely covered with dirty wraps and clothes, including its father's *General surroundings*

coat. There was not even a clean rag to protect the wound. As has before been stated, the sleeve of the frock had irritated one of the vesicles.

Sanitary condition. The sanitary condition of the house is so far satisfactory that no drain of any kind communicates with the rooms. There is not even a pipe to the scullery sink; everything is thrown into a gully outside the door. The closet is removed from the house by some 10 or 15 yards. Mrs. S. informed me that the cess-pits were emptied during the night about the second week in February, but she was not aware that there had been any offensive smell.

I was unable to discover any definite source of danger, except such as must always exist where a child has to live under unwholesome conditions. No one in the house had suffered or was suffering from any contagious disease.

Family history. Neither father nor mother are robust. The only other living child besides A. S. is pale, pasty, and unhealthy looking. A third child died of bronchitis.

Pedigree of lymph. A. S., No. 157, was vaccinated on the 27th January direct from F. J., No. 147, who was vaccinated on the 20th January from A. B., No. 139, who had been vaccinated on the 13th January.

I have seen the two latter children, F. J., No. 147, and A. B., No. 139, and found them healthy, with no history of any abnormality in the course of the vaccination. Both have healthy looking vaccination scars, and, as far as I have been able to ascertain, were quite suitable cases from which to take lymph.

With the object of ascertaining whether the four children Nos. 163–166 and their vaccinifer A. S., No. 157, were an isolated group occurring amongst a number of normal vaccinations, I have examined all the cases vaccinated at the —— station on the 20th and 27th January and the 3rd and 10th February, with the exception of *three* cases vaccinated on the 20th January from another source than A. S., No. 157, none of whom acted as vaccinifers. These three children were reported to have done well.

I have been unable to trace any general tendency to excessive inflammation round the vesicles, further back than A. S., No. 157. The diagram given in the first paragraph of this report will show the relation of the cases.

Children vaccinated, Jan. 20th.

From A. B., No. 139, there were vaccinated on the 20th January five children:—

1. N. T. H., No. 145.
2. H. S., No. 146.
3. F. J., No. 147.
4. G. R., No. 148.
5. W. B. F., No. 149.

(1.) *N.T.H., No. 145.* Up to eighth day vaccination was normal. Vesicles were then opened and Nos. 153, 154, and 155 vaccinated from them. Subsequently the arm became a good deal inflamed; but the inflammation subsided in four or five days, and on the 13th March the child was well, and had four normal cicatrices.

(2.) *H. S., No. 146.* The vesicles, which were delayed, had not inflamed. There had been no general eruption and no swelling of axillary glands or abscess. On the 17th February there were four flattened scabs. The mother stated that the original crusts had been knocked off, and when seen the edge of the sleeve was across the sores. The child was feeble, and vaccination had in consequence been deferred until it was four months of age.

(3.) *F. J., No. 147.* A healthy-looking child. When seen on the 17th February there were four normal scars from which the scabs were just becoming detached. This child served as vaccinifer to A. S., No. 157, and six other children, Nos. 156–162.

(4.) *G. R., No. 148.* Vaccination at first normal. The scabs are reported to have "come off by themselves" twice, and are said not to have been injured. This is open to doubt, as the child has suffered from convulsions, since vaccination, as he had done previously. On the 17th February there were four large raised scabs, partly removed. There was some eczema over the left eye and on the head. The general condition was good. I inspected this child a second time on the 12th March, and found two shallow cicatrices and two adherent scabs. The mother stated that about a fortnight previously there had been some inflammation round the scabs and that two of the vesicles ran into one. The eczema was much better. This is the case referred to in Mr. Lynn's letter to the Commission, dated the 18th February 1892.

(5.) *W.B.F., No. 149.* A healthy child. Vaccination pursued a normal course; there was no excess of inflammation and no rash. When seen on the 13th March there were four good cicatrices, and the child was well.

Three other children, above referred to, were also vaccinated on this day from a different source. All are reported to have done well. *Three other children vaccinated.*

From the above it will be seen that these vaccinations were unattended by any serious complication: *Summary of cases vaccinated Jan. 20th from A. B., No. 139.*

In two, Nos. 147 and 149, vaccination was strictly normal.

In two, Nos. 145 and 148, there was some excess of inflammation.

In one, No. 146, the vesicles were somewhat delayed.

Children vaccinated Jan. 27th.

From F. J., No. 147, there were vaccinated on the 27th January seven children:—

1. R. P., No. 156.
2. A. S., No. 157.
3. E. G., No. 158.
4. M. L., No. 159.
5. L. B., No. 160.
6. A. P., No. 161.
7. A. J., No. 162.

(1.) *R. P., No. 156.* On the eleventh day (6th February) enlargement of the axillary glands was first noticed. On the 13th March this had not subsided, there being at that date a considerable mass of suppurating glands, with pus pointing at two or three places. The child at this time was feeble and had much bronchial and gastro-intestinal catarrh, and otorrhœa on both sides. There were four good cicatrices. The house is poverty stricken and filthy.

(2.) *A. S., No. 157.* Vaccinifer to the cases which form the subject of this report, see page .

(3.) *E. G., No. 158.* The arm was swollen for three or four days, otherwise vaccination was normal. On the 13th March there were four healthy scars and the child was well.

(4.) *M. L., No. 159.* The mother states that by the eighth day, the 3rd February, the arm was inflamed from shoulder nearly to hand. The inflammation lasted about 14 days and then subsided without extending to body. It was followed by desquamation and some glandular enlargement, but no abscess. On the 13th March there were four good cicatrices, and the child was well. Towards the end of March the child was seized with a violent attack of vomiting and diarrhœa. Neither Mr. M. (the doctor) nor the mother have been able to give me any details of this illness, except that the symptoms continued unchecked until the 2nd April, when the child died. The mother now says that the child was never well since it was vaccinated, and attributes its death to this cause. It may, however, be noted that on the 13th March the child seemed to me to be well and bright, and the mother told me that it was so. It would, therefore, appear unlikely, although the child had suffered from severe inflammation of the arm after vaccination, that the acute attack of gastro-enteric catarrh was connected with the vaccination.

(5.) *L. B., No. 160.* Vaccination up to the eighth day was normal. Since then the vesicles had been rubbed with the sleeve, which when I saw it was filthy and sodden with pus. On the 13th March there was one healthy scar and two unhealed sores, which were reported to have been slightly inflamed during the second week. There was ample opportunity for infection; the house and all the child's surroundings being filthy in the last degree.

(6.) *A. P., No. 161.* Vaccination normal. No general rash, and no enlargement of glands. The mother reported, on the 13th March, that the child's health had been better since vaccination.

(7.) *A. J., No. 162.* Vaccination had been normal, and there were four healthy scars. The child did well.

Three other children vaccinated Jan. 27th.

From N. T. H., No. 145, there were also vaccinated on the 27th January three children:—

1. E. H., No. 153.
2. C. H., No. 154.
3. C. R., No. 155.

(1.) *E. H., No. 153.* The mother states that the arm was inflamed on eighth day from shoulder to elbow, and that no lymph was taken from it. The arm had been rubbed and the wounds had not healed well. There had been no general eruption and no enlarged axillary glands. On the 13th March there were four flat scabs. There was some eczema of the head, and the child was suffering from bronchitis.

(2.) *C. H., No. 154.* Vaccination normal, with no general eruption or glandular enlargement. On the 13th March two of the scabs had fallen off leaving small scars; one was still adherent. The child is feeble and has a nævus on the occipital region, and another which is ulcerating on the buttock.

(3.) *C. R., No. 155.* Vaccination normal. No general eruption or glandular enlargement. On the 13th March there were four normal scars.

From the above it will be seen that:

(*a.*) Of the seven cases vaccinated from F. J., No. 147:—

Two, Nos. 161 and 162, followed a strictly normal course.

One, No. 157, suffered from erysipelas.

One, No. 159, from excessive inflammation.

One, No. 156, from enlarged and suppurating axillary glands.

Two, Nos. 158 and 160, from slighter complications; the arm in one being swollen for three or four days, in the other healing of the vesicles being delayed. The latter, however, being probably due to careless treatment and dirty surroundings.

(*b.*) Of the three cases vaccinated from N. T. H., No. 145:—

Two, Nos. 154 and 155, were without complications.

One, No. 153, suffered from excess of inflammation.

From the facts stated on pages 289–291 it will be seen that:—

(*a.*) Of the five cases vaccinated from A. S., No. 157:—

Four, Nos. 163, 164, 165, and 166, subsequently suffered from erysipelas, and of these one No. 166, has since died.

One, No. 167, did not suffer from any complications.

(*b.*) The one case vaccinated from C. H., No. 154:—

No. 168 vaccination was normal.

From I. C., No. 167, there were vaccinated on the 10th February six children:—

1. O. E., No. 169.
2. M. W., No. 170.
3. A. A., No. 171.
4. L. N., No. 172.
5. S. R., No. 173.
6. T. W., No. 174.

Vaccination normal. No excess of inflammation; no glandular enlargement. On the 13th March child was well.

Vaccination normal. No excess of inflammation. On the 17th February four healthy vesicles; general condition good.

On the 17th February four good plump vesicles; areola large and somewhat diffused, extending from one vesicle to another and to three-quarters of an inch round the vesicles. No general eruption.

Vaccination normal. On the 17th February four healthy vesicles. No excessive areola. No general eruption. Child's condition satisfactory.

Some excess of areola which extended on the 17th February half to three-quarters of an inch round the wounds. Four good plump vesicles. Child's general condition satisfactory.

A good deal of surrounding inflammation extending from insertion of deltoid to the elbow; great enlargement of axillary glands, over which the skin was adherent on the 17th February. There were three well-formed vesicles; the fourth was covered with a dark depressed scab.

From the above it will be seen that:—

Of the six cases vaccinated from I. C., No. 167:—

Three, Nos. 169, 170, and 172, were normal.

Two, Nos. 171 and 173, suffered from some excess of inflammation.

One, No. 174, from considerable inflammation and enlarged axillary glands.

Note.—I visited the three children, A. A., No. 171, S. R., No. 173, and T. W., No. 174, whose arms had shown an abnormal amount of inflammation on the 17th February. A. A., No. 171, and S. R., No. 173, are both now well; they have each four normal scars. The inflammation round the vaccination wounds subsided during the second week and did not spread to the body. T. W.'s, No. 174, arm is not yet well (there is one normal scar and three adherent scabs), owing chiefly to the fact that the scabs have been repeatedly knocked off, as the mother informs me. Notwithstanding this, the inflammation which was severe during the second week after vaccination has not spread, there has been no sloughing and no abscess. In none of these cases has there been any evidence of erysipelas.

All stored lymph destroyed.

Although lymph was taken from other cases besides A. B., No. 139, F. J., No. 147, A. S., No. 157, N. T. H., No 145, and I. C., No. 167, Mr. C. L. assures me that none of it was used, and that on the 16th February he destroyed all the lymph he had in his possession, and started with an entirely new stock obtained from Mr. F. in ——. I was thus, unfortunately, prevented from obtaining any of the lymph for further investigation.

Summary.

From consideration of the above facts it would seem that the cases of erysipelas occurred as an isolated group in the midst of a number of more or less normal vaccinations. The most noticeable facts are:—

1. That no case of erysipelas occurred except in children who were present at Mr. C. L.'s surgery on the 3rd February.
2. That, except in the case of the vaccinifer A. S., No. 157, no case of erysipelas occurred in any child vaccinated on the 3rd February from a source other than A. S., No. 157.
3. That all the cases vaccinated from A. S., No. 157, with one exception, I. C., No. 167, subsequently developed erysipelas.
4. That, with the exception of T. W., No. 165, the child A. S., No. 157, itself was the *last* in point of time to show signs of the disease.

Considerations respecting the source of infection

Four hypotheses suggest themselves:—

1. That all the children may have been infected from a common source at the vaccination station on the 3rd February.
2. That they may have been severally infected from various sources owing to the prevalence of erysipelas or other infectious disease, or from coming individually into contact with such disease.
3. That A. S., No. 157, may himself have been incubating erysipelas when the lymph was taken from his arm (although at the time he showed no distinct sign of the disease), and that the children were directly infected from him.
4. That A. S., No. 157, may have become infected in the act of taking lymph from his arm, and have in reality only been the means of distributing the infection, and not the original source of it.

Infection from a common source.

With a view of ascertaining the possible existence of some cause of general infection present at Mr. C. L.'s surgery on the 3rd February I have inquired into:—

1. All the cases present at the surgery on the 3rd February. I saw all the 16 children who had been present on that day. Ten had been vaccinated on the 27th January. Two of these had inflamed arms on the 3rd February. In one case, No. 153, the inflammation extended from shoulder to elbow, in the other, No. 159, from shoulder to hand; but neither of these children showed definite signs of erysipelas. Of the other eight only one, No. 156 (besides A. S., No. 157), showed any abnormal symptom, and this not erysipelas but an axillary abscess. The remaining six were the group which form the subject of this report.
2. Mr. C. L.'s method of vaccination:—
   a. Mr. C. L. assures me that he did all the vaccinations himself, and that he had no case of erysipelas, pyæmia, puerperal fever, or other infectious disease under his care at the time.
   b. Mr. C. L. uses ordinary vaccinating lancets set in ivory handles, kept in a clean box, in clean lint, and used for no other purpose.

The surgery at which the vaccinations were performed is small but well warmed. It suffers, in common with all such places, from the want of cleanliness of the persons who frequent it. All kinds of cases are seen there, but, as stated above, I could find no ground for the suspicion that there was any general source of contamination present on the 3rd February. On the 13th February I was present when Mr. C. L. was performing his vaccinations, and his method of vaccinating seemed to be in accordance with the regulations of the Local Government Board. The lancet was clean and bright, and all the apparatus seemed clean and in good order. He dipped the lancet in water and wiped it between each act of vaccination. It must, however, be open to doubt whether the method of cleaning the lancet is really efficient, for the same water and the same rag is used throughout, so that they might be contaminated with any infectious matter and *recharge* the lancet when next rinsed or wiped. There is, however, no evidence that this actually occurred.

The fact that the severity of the cases of erysipelas did not follow the order of their vaccinations is strongly opposed to the view that the virus originated from a dirty instrument, as this might have become cleaned in process of use. M. H., No. 166, vaccinated fourth in order,

sickened earliest and died ; and F. H., No. 164, sickened last but one, and recovered first.

It may be noticed, in passing, that the statements of the mothers seemed to be too much relied on with regard to the health and freedom from eruption of their children. Mrs. C. L. makes the inquiry whether they are healthy and free from any "breaking out," and if the answer is in the affirmative, vaccination is proceeded with without inspection. One child during my visit, stated by the mother to be free from eruption and healthy, was found, on removing its napkin, to be suffering from eczema.

The above inquiries do not lend support to the view that all the cases of erysipelas originated from a common source present at the surgery on the 3rd February, such as a person already suffering from erysipelas or some virus communicated by the person or instruments of the vaccinator.

That there was no such common cause is further suggested by the fact that, with the exception of A. S., No. 157, and his sub-vaccinees not one of the children who were vaccinated or whose vesicles were opened on the 3rd February contracted the disease.

Infection owing to prevalence of, or contact with, infectious disease?

The great variations in the length of the incubation period of the five cases who suffered from erysipelas is at first sight a strong argument in favour of the view that all the cases were not infected at the same time from the same source. Inquiry, however, does not afford any evidence which would tend to confirm the theory that the children were separately infected.

1. Personal inquiry and application to Mr. C., Medical Officer of Health, failed to elicit any information as to the prevalence of the unusual amount of infectious disease.
2. I visited all the children at their own homes, and in no instance did I discover any person living in the same house suffering from infectious disease. Neither was I able in any case to trace the erysipelas definitely to any local cause in the child's home ; although in some cases, as in that of F. H., No. 164, the surroundings were filthy.

Direct infection from A. S., No. 157?

With regard to the third hypothesis, namely, the possibility of infection from the vaccinifer A. S., No. 157, two objections may be made :—

i. On the ground of the great difference in the incubation period in the several cases. The same difficulty would, however, present itself were the theory of simultaneous infection from a common source other than A. S., No. 157, accepted. This period varies from about six hours in the case of M. H., No. 166, to 12 days in that of T. W., No. 165, and *possibly* 18 days in the case of the vaccinifer.

That the length of the incubation period of erysipelas may vary in a remarkable degree is shown in a series of cases on which reports have been made by Dr. Barlow to the Commission and by Dr. T. W. Thompson to the Local Government Board (see Case 23 [Series], pages 93–104). In this instance four cases showed signs of inflammation on the first day, that is, within 12 hours at the *outside ;* four cases on the second day ; three on the third day ; and (besides several others) two on the ninth day, and one on the tenth day.

The length of the incubation period is probably affected by many circumstances :—

a. By the power of resistance of the individual. Although experimental observations on such points on animals are in many ways fallacious, it is worthy of note that a given cultivation of *Micrococcus erysipelatosus* in the case of a rabbit produced inflammation in two and an abscess in three days ; whilst in a calf, even when associated with vaccine lymph, the same virus produced no result(original observation). The incubation period is given as 12 hours to 14 days by different observers (for details see *Deutsche Chirurgie, Lief. 5, "Erysipelas," Dr. H. Tillmans, at pages 96 and* 120).

Thus experimental as well as clinical observation would give ground for believing that great variations may occur in the effect produced on a series of persons inoculated with the virus of erysipelas from the same source ; and that the power of resistance of the individual is an important factor in deciding the length of the incubation period.

b. By the dose of the poison which in the case of a virus inoculated with vaccination would be likely to vary within wide limits.

Note.—The above views as to the incubation period of erysipelas will be seen to differ considerably from those expressed a year ago in the case of H. J. E., of ——, Case 32. (See pages 109–11.) In that case it is argued that the occurrence of erysipelas after the eighth day is strong, presumptive evidence against the virus having been inoculated at the time of vaccination. This view, with certain reservations, is probably correct, and it would seem that no certain deduction can be drawn as to the origin of a "late" erysipelas after vaccination, without strong corroborative evidence that the poison was actually introduced at the time of the operation.

2. A further objection to A. S., No. 157, being considered the source of infection may be made on the ground that he was the last in point of time to show signs of erysipelas.

There are, however, parallels to such a phenomenon. In a series of cases on which reports were made to the Local Government Board (see Cases LXXXIII., LXXXIV., and LXXXV., pages 29–31), three children were vaccinated from one source, the vaccinifer and two of the children subsequently suffering from erysipelas. In these cases a source of infection is *known* to have existed on the day when the vaccinifer was vaccinated, but not on the day when its vesicles were opened.

Infection indirectly through A. S., No. 157?

Lastly there are many objections to the further hypothesis that the infection in these cases was derived from one of the children whose vesicles were opened or from one of those who were vaccinated, and conveyed to the vaccinifer A. S., No. 157, by the lancet, and again from him to his sub-vaccinees :—

1. None of the children whose vesicles were opened subsequently developed erysipelas.
2. If one of the vaccinees was the source of infection it must have been B. S., No. 163, as he was the first to be vaccinated, and the cases vaccinated immediately after him did not suffer the most severely.
3. Supposing A. S., No. 157, to have become infected from B. S., No. 163, in the act of having lymph taken from his vesicles for B. S.'s vaccination, it is very improbable that more than one pock would have been infected.

It is probable that lymph was taken from all the pocks on A. S.'s arm, and Mr. C. L. states that he not only wipes the lancet between each vaccination, but between each act of vaccination. It would therefore be almost inconceivable that under these circumstances infection should have been communicated to the other cases in this way.

Note.—The subjoined table will show the remarkable fact that, presuming all the cases to have been infected from one source on the same day, whether from A. S., No. 157, or from some other common source of infection, the severity of their symptoms is inversely proportionate to the length of the incubation period.

	First appearance of erysipelas.	Severity.	Course.	Result.
No. 166. M. H. -	6 hours.	Great. Diffuse swelling ; abscesses.	Acute.	Death on 20th day.
No. 163. B. S. -	16 hours.	Great. Diffuse swelling ; pyæmia.	Subacute.	Abscesses : scalp ; scapula ; shoulder joints ; wrists ; &c. Not fatal.
No. 164. F. H. -	5 days.	Less severe : no suppuration.	Subacute.	Recovery.
No. 165. T. W. -	19 days.	Less severe : axillary abscess after five weeks.	Chronic	Recovery.

Conclusion.

1. The above considerations lead to the conclusion that the four cases of erysipelas in the children Nos. 163, 164, 165, and 166, all had an origin peculiar to them and not common to all the children present at Mr. C. L.'s surgery on the 3rd February.

2. The fact that no child except those vaccinated from A. S. No., 157, contracted the disease, although there were 11 others present on that day, and that all the children vaccinated from him suffered except one ; the absence of any other known source of infection, peculiar to this small group of cases and not affecting the others, makes the probability almost into a certainty that the infection of the erysipelas was derived from the vaccinifer A. S.

3. The fact that A. S.'s arm showed no signs of erysipelas on the eighth day, whilst exonerating the vaccinator from blame in selecting him as the source of

lymph, gives additional importance to the exact observance of the instructions of the Local Government Board not to take lymph "from a vesicle around which there is any "conspicuous commencement of areola," since, if the statement of Mrs. S., the mother of A. S., be correct, there was in this case some inflammation round the vesicles on the eighth day.

Attention should be directed to the hardship of compelling the mothers to bring their children to the doctor for inspection on the eighth day, regardless of the weather. The day on which I was present, the 17th February, was bitterly cold, with a driving wind and deep snow, conditions which could not but be dangerous to young infants, more especially when brought from a considerable distance inadequately clothed and beginning to feel the full effect of the febrile and constitutional disturbance caused by the vaccination.

As will be seen in another part of this report, three of the five children brought up for inspection on this day were suffering from excessive inflammation round the vesicles, and were therefore in a condition to be easily affected by exposure to wet and cold.

THEODORE DYKE ACLAND, M.D.

CASE 116, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of G. P. B.: report to the Commission of Dr. Theodore Dyke Acland.

G. P. B., of ——, was vaccinated on the 2nd January 1892.

19th February 1892.

"Vaccination, 35 days; erysipelas and abscess, 14 "days; empyema, six days."

H. V., M.D., of ——.

Calf lymph obtained from Dr. R., of ——.

Two. In one of these vaccination is believed to have run a normal course. Dr. H. V. was unable to give me the name of the child, so that I did not see the case, but he had seen it on the eighth day, when it was doing well, and he had heard nothing of it since. In the second case, that of E. M. R., of ——, an erythematous blush started from the points of inoculation on the 10th day and spread over the body. This rash lasted from 24 to 48 hours, and then entirely disappeared. The child was not at any time ill, and no abscess formed; the mother says she had no anxiety about the child, who recovered rapidly and completely. The vaccination vesicles healed well, and when I saw the child on the 21st April, there were three normal cicatrices without any induration round them, and with no evidence of there having been any loss of tissue. The child was well, but there were two other children ill with scarlet fever in the same house.

Up to the 15th day vaccination appeared to be normal. There was no undue inflammation, no sign of irritation of the glands in the axilla, and no rash upon the body. About the 16th or 17th day the nurse thinks that the upper of the three scabs was injured when the child was in bed. That this scab was injured is not certain; but on this day it was noticed that this pock was not healing as well as the other two, and there was a scanty thin discharge coming from it. Dr. H. V. also noticed that this scab was different from the others, and not adherent to the wound below. It is believed that it never became entirely detached, but from this time the cicatrization of the upper vesicle did not proceed naturally; the two lower pocks healed well and completely, and for about a fortnight the child's general health did not seem to suffer. At the beginning of February the child became restless and cross, and by the 6th February there was distinct inflammatory hardness round the upper vaccination vesicle; the subsequent course of the child's illness is best told in Dr. H. V.'s own words:—"Erythema extended over the shoulder "and chest, there was also erythema of the left thigh ". . . the left arm was swollen. Subsequently a "considerable hard swelling formed over the left "pectoral muscle, terminating in an abscess which "broke near the axillary line. Chest symptoms fol- "lowed; fluid collected in the left pleura, from which I "aspirated one and a half pints of sero-purulent fluid "and subsequently drained the pleura by an incision, "and inserted a drainage tube. The above facts show "that the child died from septic infection resulting in "the formation of abscess and empyema, the infection "taking place through one of the vaccination "wounds."

Considerations as to source of illness.

The main point to be considered is the origin of the septicæmia, and whether it was due to the lymph, the method of vaccination, or to some extraneous cause.

The lymph.

As regards the lymph, although one of the two co-vaccinees suffered from a erythematous rash there was nothing in the history of the case to show that vaccination pursued other than a normal course, and nothing to lead to the suspicion that the lymph itself was at fault.

Method of vaccination.

A Cooper Rose needle was used for performing the vaccination. When I saw it, it was as clean and well kept as such an instrument could be, but it is essentially a dangerous instrument, and I doubt whether any method of disinfection short of heating in a spirit lamp should be considered an entirely reliable method of cleansing it.

Sanitary conditions.

The sanitary condition of the house in which the child lived was very imperfect a year ago, so much so that the drains were put thoroughly in order in consequence of the elder child B. B. having suffered severely from sore throat. Mr. B., the father, states that he himself has never felt well in the house, and though I am unable to learn from Dr. W., the Medical Officer of Health, who has had the house thoroughly inspected, that there are now any serious sanitary defects, it is admitted that the drainage has been bad and that the inmates of the house have suffered in consequence.

General surroundings.

The most important fact that I have been able to learn bearing upon the possible source of infection of the vaccination wounds is that at the end of December 1891, the deceased's sister, B. B., seemed to be failing in health. The glands at the side of her neck became greatly enlarged, and towards the middle of the third week in January a large abscess which had formed was opened by Dr. H. V. It is important to note that the opening of the abscess took place on or about the day on which it was first noticed that the vesicle on the child G. P. B.'s arm showed signs of not healing properly, and that this abscess continued to discharge for five or six days. It certainly had not healed until the 23rd January. The child not being well did not leave the house until the 25th January, and during all this period the two children, B. B. and G. P. B., were together during the day, though sleeping in different rooms. The nurse attended to the vaccinated child G. P. B. and the mother to B. B., but G. P. B. was sometimes nursed by one and sometimes by the other.

During this period the vaccination vesicles were covered by a small piece of silk and by the woollen sleeve of the child's dress, and it is not known that there was any probable direct infection of the wound with pus from the suppurating cervical glands, and it also should be noted that it was not until the glands in B. B.'s neck had healed that erysipelas commenced in the baby's arm.

Conclusion.

Taking all these facts into consideration, I am of opinion that all the causes above enumerated may have contributed to the fatal result.

1. Vaccination with a Cooper Rose needle must be attended with a certain risk unless the most scrupulous care is exercised.

2. The child had been living under conditions which were known to have been insanitary, and which had affected the health of other members of the same family.

3. He was for several days, and before one of the vaccine vesicles had completely healed, in close relation with another child who had a considerable purulent discharge from an opened abscess.

It is possible that the wound was infected from this latter source and that the child succumbed more readily than if its surroundings had been entirely healthy.

THEODORE DYKE ACLAND, M.D.

CASE 117, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of O. L. An inquiry was made into this case by a Medical Inspector of the Local Government Board. The following is an abstract of his report:

Local registrar's register contains entry of death on the 27th February 1892 of O. L., aged eight months, certified

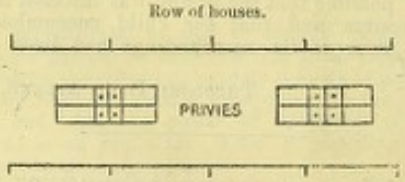
by Mr. R. as from "vaccination; convulsions." Dr. Bruce Low was directed to investigate this case and reports to the following effect:—

O. L. was vaccinated direct from the arm of an infant C. J. E., along with three other babies on January 25th by Dr. D., Public Vaccinator, at his surgery, which is the public station. Four insertions were made in each case and were successful in every instance. Dr. D. scratches the arm with a bright lancet, which was perfectly clean when seen by Dr. Bruce Low. He always, he says, cleanses the instrument between each operation. The lancet is, so he states, used for no other purpose. Dr. D. says there were not at the time any cases of zymotic or septic illness in the locality so far as he knows. The surgery hour for seeing ordinary cases is from 9 to 10, and the hour fixed for vaccination is 2 o'clock. Dr. D. says the windows are always open in the interval. No case of abscess, ulcer, or unhealthy wound had been treated or dressed in the surgery about the time of the vaccinations.

Dr. Bruce Low called upon the vaccinifer C. J. E., No. 290 in the register. There are, he says, three other children in the family, all in good health. The vaccinifer is a fine, plump, rosy-cheeked child. Her mother says the vaccinated arm went on well from the very first. At no time was there inflammation of the arm, and the places healed in less time than had the vaccination of her three other children. Mrs. E., her house, and her children were conspicuously clean. Dr. Bruce Low called upon the three co-vaccinees, Nos. 317, 318, and 319, and in each case the mother assured him the vaccination had done well and given no trouble or anxiety. He also saw the arms of several other children vaccinated at the station (*i.e.*, the Public Vaccinator's surgery) during the January period. In no case was there any complaint as to the course of the vaccination, which appears in all to have been normal.

Mrs. L., the mother of deceased, says she believed her baby to be quite well when she took it to the station to be vaccinated. The four places took. There was no inflammation on the eighth day (February 1st) when she went back to have the child's arm inspected. The doctor did not puncture or touch the vesicles. On the ninth day (February 2nd) the child began to be fretful, and she noticed after this that the arm became angry and inflamed. On the 13th day of the vaccination she noticed a swelling in the armpit. On this day (February 6th) the arm was inflamed from shoulder to elbow. On the 15th day (February 8th) she sent for Mr. R., who ordered poultices to the swelling in the armpit. An abscess formed in the pectoral region and burst the day before the child died, on which day the infant had several convulsions. When the abscess was pointing and softening, the arm seemed greatly to improve, firm crusts had formed on the vaccination places, and the swelling of the arm had almost subsided.

Mrs. L. had one other child, aged four years, apparently in good health. The family history on both sides seemed good. Mrs. L. says there had been no illness for some time in the house, except that they all had influenza before Christmas. She knew of no visitors or friends coming to the house suffering from abscess, ulcer, or the like. She says that she never applied anything to the arm before Mr. R. came, except bread poultices. She says she washed the arm every day with warm tap water (the public water-supply is piped to the house from a distance, and is stated to be satisfactory in quality and quantity), and wiped it dry with a clean linen rag. No shield was worn. The dress was of red tartan flannel, but the sleeve was taken out before the eighth day. No injury, so far as she knows, was done to the pocks while nursing. She always nursed the baby herself, except on washing days when a neighbour's girl, aged 13, nursed the infant. The house was dirty and Mrs. L. herself was neither clean nor tidy. Outside in the yard, 15 paces from the house, is the privy. The privies for this and the adjoining are in blocks of four, thus:—



The arrangement is that each house has a pail closet situated in the yard. The pail in the L.'s closet was in a foul state, and Mrs. L. admitted it had not been emptied for at least three weeks. It appears the occupier has the duty of emptying these pails imposed upon him. The other closets in the group were in a like condition, the excuse being they could get no one to empty the pails, and they had nowhere to empty the contents except on a piece of waste land just in front of the cottages, and then the neighbours complained of the smell. The pails seen by Dr. Bruce Low were in such a condition as not to be usable. The slop drain at the back door of Mrs. L.'s house was choked, and Dr. Bruce Low was told that this was a frequent occurrence. The slop water was thrown into the lane, as also was the house refuse and ashes, since there was no ashpit provided. Altogether the sanitary surroundings were bad. There was evidence, too, of apathy and disregard for decency and cleanliness both inside and outside the house. In confirmation of this last statement Dr. D. stated that while the child L. was being vaccinated it had an offensive motion in the surgery, and the excrement escaped on to the dress of mother and child. Dr. D. was informed by the other mothers that the infant was carried away wrapped up in its filth, Mrs. L. making no attempt whatever to cleanse the child or its clothing.

Mr. R. says he found the arm much swollen and inflamed when he was called in on February 15th, and the vaccination sores were "weeping." The child died in convulsions. He could not account for the abnormal course of the vaccination, except that it might be due to "some "peculiarity of constitution."

Case 118, reported to the Commission by the Local Government Board.

Case of M.O'B.: report to the Commission of Dr. Theodore Dyke Acland.

M. O'B. was vaccinated on the 9th February 1892 by Mr. A. E. D., M.R.C.S., Medical Officer to the ——— Union Workhouse, when 12 days old. *Vaccination.*

20th February 1892. *Death.*

24th February 1892. At the ——. *Inquest.*

"Erysipelas following vaccination." *Verdict.*

Calf lymph, procured direct from Dr. R., of —. *Source of lymph.*

Six. Vaccinated at the same time in the Workhouse. Several others vaccinated privately. *Co-vaccinees.*

The six cases vaccinated in the Workhouse were:—

1. W. B. M. Vaccinated on eighth day. I am informed by the nurse of the children's ward and Mr. A. E. D. that vaccination pursued a normal course until the 19th day when the mother left the Workhouse. She was away only one day and was then re-admitted. At this time she accidentally injured the scabs which had formed, removing them and leaving the sores exposed. There was subsequently a good deal of inflammation, and the vesicles coalesced. The inflammation did not, however, extend and under treatment entirely subsided, leaving (9th April) an irregular depressed cicatrix, which shows considerable loss of substance.

2. E. B. C. Vaccinated when eight days old. The mother was removed to the Infirmary on the 16th March, and is still (9th April) there. As far as I could ascertain by inquiry the child's vaccination pursued a normal course, and the arm was well at the time of the mother's discharge from the Workhouse. The child has since died in the Infirmary. Mr. J. B. N., the Medical Officer, informs me that she was admitted into the Infirmary "on March 16th last with her "mother, who is phthisical and suffering from phlegmasia "alba dolens; the child had a slight eczematous rash on "buttocks, thighs, and genitals, the result of the irrita-"ting effects of urine, had been weaned, was rather thin, "but no abnormality was observed in respect to the "vaccination cicatrices. The child rapidly wasted in "spite of treatment and careful dieting, and died on "April 4th of congenital debility and marasmus."

3. F. W. Vaccinated when seven days old; the mother left the Infirmary on the 20th February. Up to that time vaccination had been normal.

4. F. M. Vaccinated when eight days old; vaccination had pursued a normal course up to the 23rd February, when the mother left the Workhouse.

5. C. S. Vaccinated when four days old. The mother left the Workhouse on the 20th February. At that date the arm was doing well.

6. H. W. Vaccinated when three days old. When taken out by mother on the 27th February the arm was doing well.

With the exception of W. B. M. (1) and E. B. C. (2), I have not been able to trace any of these children; their addresses being unknown. The above statements are given on the authority of Mr. A. E. D., the Medical Officer, the Master of the Workhouse, and the nurse of the children's ward.

Dr. Airy, of the Local Government Board, also informs me that when inspecting the vaccination registers at the Workhouse on the 18th February he saw all the above cases, and found them pursuing a normal course.

The child M. O'B. was vaccinated on the 9th February. The mother left the Workhouse of her own accord on the 12th. Later Mr. A. E. D. happened to meet her (about the 9th day after the vaccination), and finding that the child's arm was inflamed tried to persuade her to return to the Workhouse. This she refused to do. The inflammation continued to spread over the child's body, and on the 20th February she died, without, as far as I can ascertain, the mother having made any attempt to obtain medical advice. Dr. T. S. was at the last called to see the child, but when he arrived she was dead. He tells me that he has no doubt that the child died from erysipelas spreading from the vaccination wounds.

The conditions under which the child lived on leaving the Workhouse were most unfavourable. The house, —— ——, is miserably dirty and dilapidated. The weather was very cold, and the child was exposed to it insufficiently clothed. There is small wonder that under such circumstances the wound took on an unhealthy action.

Note.—I have had to depend for my information in this case upon the evidence of Mr. A. E. D. who performed the vaccination, and Dr. T. S., who made the post-mortem examination. I have been unable to find the child's mother, as she left the house where she had lived on the day after the inquest, and neither the present residents nor the caretaker could give me any information about her.

The child M. O'B. died of erysipelas spreading from the vaccination wounds. There is no evidence to show that the lymph or vaccinator were at fault. But there can be no doubt that the child's death was accelerated by its being removed from the Workhouse within a few days of its vaccination, and subjected to conditions which, under any circumstances, would prove a source of great danger to an infant of such a tender age.

THEODORE DYKE ACLAND, M.D.

CASE 119, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of G. E. M. An inquiry was made into this case by a Medical Inspector of the Local Government Board. The following is an abstract of his report:

G. E. M. was vaccinated at home on February 25th, 1892, when about three months old, by Mr. C., a private practitioner. She died suddenly on March 1st. The death was not medically certified, but the local registrar returned the death as having resulted from "sudden convulsion after vaccination." Dr. Bruce Low was directed to investigate this case and reports to the following effect:—

Mrs. M., mother of deceased, states that her baby seemed quite well on February 25th when Mr. C. vaccinated it. The child continued bright and lively up to the night of February 29th. During that night it appeared a little restless. The mother says there was then a slight redness round the three vaccinated places, but all redness had gone by the next morning (March 1st), when nothing but three ordinary vaccination pocks, free from inflammation, were observed. The baby was drowsy during the day, and did not take its food well. Towards evening it vomited once. After tea-time (between 5 and 6 o'clock) the child was put into its cradle and appeared to go to sleep. About 8 o'clock Mrs. M. took it up, and being struck with the unusual expression of the child's face, she called her husband and went at once for the doctor. Mr. C. attended almost immediately, but found the baby dead on his arrival.

No applications of any kind were made to the arm, nor was there any evidence of injury to the vaccine vesicles after they began to rise. The child was fed partly by the breast and partly by Savory and Moore's food given by means of a bottle. Although the child had a cough when born on December 2nd, 1891, it had good health up to about January 13th, 1892, when it had an attack of bronchitis, for which it was medically attended by Mr. F. (Mr. C.'s partner). This gentleman discontinued his attendance on January 27th, the infant then having completely recovered.

There is one other child of the family, aged about two years, apparently in perfect health. The house is situated over the shop (a saddler's) and business premises. There is ample space and the rooms are clean and well furnished. The father and mother seemed healthy persons. No insanitary conditions were observed.

Mr. C. says he vaccinated the child G. E. M. in three places with lymph in a tube which had been filled three days before, from the arm of an infant named G. (a private patient). He scratches the arm and rubs in the lymph with the blade of his lancet, which when seen by Dr. Bruce Low was bright and clean. Mr. C. seems to observe all the ordinary precautions in the performance of his vaccinations.

Dr. Bruce Low saw the vaccinifer G. There were three good scars on the arm. Mrs. G. says her child's vaccination ran the usual course, and healed well. At no time was the arm inflamed, and the child's health was never disturbed by it. Only one tube of lymph was taken from G.'s arm on February 22nd, and that tube was used in the vaccination of the child G. E. M. Mr. C. is strongly of opinion that the child died from a sudden convulsion, but that the convulsion had nothing to do with the vaccination. He states he informed the child's father of this opinion.

The registrar of deaths says that the father told him the child had died from a convulsion after vaccination, and he therefore filled in this statement in the certificate form. Mr. M., however, denies this, and says the registrar himself said he was of opinion that the convulsion resulted from the vaccination, and put this in the form of a question to him, and that he (M.), not seeing the object of the suggestion, agreed to it. Mr. M. admits this assent was given in a weak moment and without due consideration, and he now says that, after what Mr. C. has said, he cannot place any blame upon the vaccination as causing the convulsion.

Mr. C. further states that his partner Mr. F. had said that, when attending the child G. E. M. for bronchitis in January last, he had been struck with the shape of the infant's head, the fontanelles being unusually open, and that in consequence he had remarked to Mrs. M. that there might be danger of "fits" later on when the teething period arrived.

CASE 120, REPORTED TO THE COMMISSION BY MR. J. H. LYNN.

Case of H. G. A. D.: report to the Commission of Dr. Theodore Dyke Acland.

H. G. A. D., then aged three months, of ——, was vaccinated on the 1st December 1891 by Mr. F. W. S., Public Vaccinator for ——. The vaccination was unsuccessful. *First vaccination.*

On the 8th December 1891 by the same vaccinator. *Second vaccination.*

8th March 1892. *Death.*

"Whooping-cough; convulsions." *Certified cause.*

J. S. C., L.R.C.P., assistant to Mr. I. P., of ——. *Certified by.*

According to the register H. G. A. D. was vaccinated direct from the arm of B. P., No. 349, of ——. There is no entry of a second vaccination. Subsequent inquiry has, however, elicited the fact that the register is not correct, and that this entry refers only to the first and unsuccessful vaccination. Mr. F. W. S. informs me that the second vaccination was performed with lymph from another source, viz., direct from the arm of D. M. W., of ——. The vaccinifer and co-vaccinees in each case have, where possible, been seen with the following results:— *Source of lymph.*

B. P. A well-to-do, well-nourished infant, who at the date of my visit, on the 12th March 1892, appeared to be in excellent health. According to the mother and the vaccinator there was no appearance of excessive inflammation on the eighth day after vaccination (1st December 1891). The vesicles were then unbroken and normal in appearance, and no fact has been elicited to show that the child was not a proper one to use as a vaccinifer. About *Vaccinifer (first vaccination).*

a week after the vesicles were opened there is said to have been a good deal of discharge from them, and from the condition of one of the cicatrices there would seem to have been some slight suppuration. There was, however, very good reason for this, as the vesicles were dressed with a mixture of pounded house-leek and cream. It is a matter of surprise that more irritation was not set up. There was not any general eruption nor any enlargement of axillary glands. At my visit on the 12th March I found four rather red glazed cicatrices, one having an irregular outline as though there had been some loss of tissue.

Co-vaccinees. One. E. C., of ——, No. 358 in the register. A healthy child. Vaccination pursued a normal course, and there are four normal scars.

Sub-vaccinees. None. Vesicles not opened.

Vaccinifer (second vaccination). D. M. W. A healthy child in good condition, and according to the mother not ailing in any way. Vaccination was without complication, and the pocks healed well in less than three weeks. (Seen on the 27th April 1892.)

Co-vaccinees. Three. Of these two could not be traced, owing to wrong addresses having been given. They were, according to the register: J. W. H. A., of ——, A. E. H., of ——, and E. B. C. The third case, E. B. C., had moved to some place in ——, but I was informed by a woman who had known the parents well that the vaccinated arm had healed quickly, and that the child was in good health for some time before they moved.

Sub-vaccinees. None. Vesicles not opened.

Child's condition previous to second vaccination. Between the first vaccination on the 1st December 1891 and the second on the 8th December the parents state that a few vesicles appeared on the back of the child's neck. They developed one after the other, and Mrs. D., the mother of the child H. G. A. D., says that she did not show them to Mr. F. W. S. He is, however, of opinion that he did see them, but did not attach much importance to them, and he performed the second vaccination as no vaccination vesicles had developed at the site of the first operation.

Course of vaccination. Mr. F. W. S. informs me that, as far as he knows, the second vaccination pursued a normal course. This statement is confirmed by the father and mother who, though they say that the child had never been well since vaccination, say also that the pocks healed well, and without the appearance of any eruption on the body or of glandular enlargement. They also inform me that when the child was taken for the first time to Mr. I. P.'s surgery the vaccination vesicles were completely healed, and they made no complaint about the child's ailment being due to vaccination. This statement is confirmed by Mr. I. P. and by Mr. J. S. C., his assistant, who was in the surgery at the time.

Course of illness. Some time in January the child was taken to Mr. I. P.'s surgery with (according to the mother's statement) a vesicular eruption. I have been unable to obtain any accurate description of this; neither Mr. I. P. nor Mr. J. S. C. have any distinct recollection of the case at this period. The mother, however, says that the vesicles did not come out all at once, but succeeded one another in crops, and they do not appear to have been numerous. The child was taken three times to Mr. I. P.'s surgery. On one of these occasions it was seen by Mr. J. S. C., who tells me that the child was suffering from whooping-cough and was very weak and ill. Up to this period it seemed to have been ailing, but was not really ill. On the 27th February it began to have a very violent spasmodic cough, becoming cyanosed during the paroxysms, and both its father and mother, and Mr. J. S. C. and Mr. P., junr., who saw the child at home, agree that she was suffering from whooping-cough. From this attack she never rallied, but gradually sank from exhaustion and died on the 8th March. On the 3rd March a lump was first noticed on the left side of the head, which proved to be a small abscess, caused apparently by the irritation of neighbouring eczema.

There is stated to have been some superficial ulceration on the hands, which had quite healed before the child's death. No record having been kept at Mr. I. P.'s surgery, the information as to the course of the child's illness is both scanty and incomplete. Mr. I. P. tells me through Mr. J. S. C. that he remembers seeing a few vesicles on the child's head, and also a sore on each thumb, and that he might have told the child's mother that he thought it was chicken-pox, as she had stated, but he has no distinct recollection of having done so.

Condition after death. On examination (on the 12th March) after death, I found the child small and rather emaciated. There were *two* small vaccination scars on the left arm which do not show any evidence of having been unduly inflamed or indurated. There was no general eruption on the body and no enlargement of the axillary glands. On the occipital region there was one small patch of eczema, and some intertrigo about the groins and labia. On the left parietal region there was a small abscess, over which the integuments were thinned and discoloured. There did not seem to be any other scar or eruption on the body.

I informed the father and mother that it would be desirable to make a post-mortem examination on the ground that from the external appearances there was nothing to indicate that their child's illness was due to vaccination, and that it was of importance to make as complete an examination as possible into the cause of death. Neither father nor mother would permit the autopsy to be made; the father saying that though the child had been sickly for three months he knew that she had suffered very severely from whooping-cough, and he did not think that her death was due to vaccination; under these circumstances I did not press the matter.

Method of vaccination. I was unable to witness the vaccinations at Mr. F. W. S.'s surgery, but he assures me that he takes every reasonable precaution.

Previous history. The child is said to have been fat and well nourished up to the time of vaccination, but it was small and one of twins, the other having been still-born. There are not and have not been any other children.

Family history. Up to the middle of October last the mother had an abscess in her left breast, with profuse but not offensive discharge. The wound is said to have been completely healed some time in November, but during the continuance of the suppuration, although very ill, she continued to suckle the child with the right breast and it seemed to thrive, showing no sign of any gastro-intestinal irritation Father and mother are young and seem to be healthy.

General surroundings. Satisfactory. The house is new, and only two rooms of it are furnished; they were clean and tidy.

Sanitary conditions. Satisfactory.

Conclusion. I have been unable to obtain any clear evidence as to the nature of the maladies from which H. G. A. D. suffered subsequently to vaccination.

The second vaccination does not seem to have presented any abnormal symptoms, unless the fact that only two pocks formed at the four points of inoculation may be so considered.

Mr. F. W. S. is not sure that the vesicles which appeared between the 1st and 8th December were *not* due to chicken-pox (varicella), but neither Mr. I. P. nor Mr. J. S. C. remember anything accurately about them. There is no reason why varicella should not develop during vaccination, and it may in this case have done so, but there are two circumstances which make it doubtful whether the child suffered from this exanthem:—

(1.) There is no ground for believing that the vesicles of varicella could have continued to develop during a period of three months. The "watery blisters" which are stated by Mr. Lynn to have appeared all over the child are said never to have left it; and to be still visible at the time of death. Neither Mr. F. W. S. nor I could find anything but eczema after death.

(2.) It is almost inconceivable that with the eruption of an acute specific fever out on its body, the mother should have taken the child in the middle of winter to be vaccinated the second time, and that she should later have taken it in this same condition to Mr. I. P.'s surgery on more than one occasion.

It would rather seem probable that the eruption was eczema, which was present to a small extent after death; and possibly a vesicular eruption followed vaccination and was consequent upon it. It is clear from the evidence of the parents and doctors that the child failed in health some few weeks after vaccination, the wounds having entirely healed, and that it subsequently suffered severely from whooping-cough. The constitutional disturbance produced by the previous vaccination may have accelerated the final catastrophe, but there is no evidence to show that it was the primary cause of the child's death.

Mr. F. W. S. has forwarded the following statement which he has communicated to the Local Government Board:—

Re H. G. A. D.

I first vaccinated H. G. A. D. on December 1st, 1891. She was brought up for inspection on December 8th, 1891; none of the places having taken; on that day the mother pointed out two very small vesicles on the neck, at the same time stating that there were one or two spots on the body like them; she asked me if I thought the vaccination had caused them. I told her that I did not think it had, that it was probably a slight attack of chicken-pox, and as the child was in good health otherwise, and there were no febrile symptoms, I did not see any reason why she should not be vaccinated again. I performed the operation and the arm took in two places only, and on coming up for inspection the following week the child was in good health, and there were still only one or two vesicles about the body. I know nothing of the case since, except that it was certified by Mr. J. S. C., of ———, to have died of whooping-cough and convulsions, three months after vaccination.

I may say that I did not state there was no harm in vaccinating a child who was suffering from chicken-pox, but simply stated, I saw no objection in the present instance.

F. W. S.

As Mr. F. W. S.'s statement deals with the question of vaccinating the child whilst suffering from the so-called chicken-pox, I have given it in full.

Note.—Professor Louis Thomas of Leipzic states (*Handbuch der Spec. Path. in Ther. Von Ziemssen, volume II., part* 2, 1874, *at page* 24), "The result of cow-pox inoculation "may be perhaps slightly retarded by varicella as by other "diseases, but beyond this it makes no difference even "though vaccination is performed during or just subsequently to an attack of varicella."

THEODORE DYKE ACLAND, M.D.

CASE 121, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of E. L. H.: report to the Commission of Dr. Theodore Dyke Acland.

E. L. H., then aged three and a half months, was vaccinated in five places on the 9th February 1892 at — by Dr. R. C.

2nd March 1892.

10th March 1892.

"Septicæmia following vaccination."

Calf No. ——.

Forty-nine. About whom Dr. R. C. writes as follows: "Forty-three of these took in five places, four took in four, "one took in three, and one in two. The case in question "took in five places so that the insertion success was 96·4 "per cent. In 1890-91 my average success for the whole "year was 96·8 per cent., so that this day's average was my "ordinary success. I mention this fact, for I find that the "success rate is generally lower where the sore on the arm "was more severe. The temperature of the calf was higher "than the average temperature of the calves before "vaccination; it was 103·7, the average temperature "being 102·5."

None.

The information in this case is very meagre and for the most part not reliable. Mrs. H., the mother of the child E. L. H., refused to see me, and from the tone of the reply which I received from her husband I concluded that it was useless to make any inquiry from him. My communications with Dr. H. were hardly more successful, and I was in correspondence with him for three months before obtaining any details of the case. Under these circumstances it appeared to me unlikely that an inquiry conducted on the spot would be productive of any good result. The following facts have therefore been gathered from the depositions and from correspondence. A few days after vaccination (date not mentioned), the sores appeared to be running into one another. The mother bathed and poulticed the arm. No one, however, except Dr. H.'s assistant saw the child until after its death. Dr. H. then found that the pocks had become confluent, forming one large ulcerating surface. It was stated at the inquest that on the seventh day after vaccination the sternal end of the child's left clavicle was found to be dislocated.

Method of vaccination. In accordance with the regulation of the National Vaccine Establishment.

Treatment of vesicles. Poultices applied by the mother and the arm bathed.

Previous history. Bad. The child, according to Mrs. H., the mother, had been delicate from birth. Dr. H., by whom it had been treated, writes that "it was an unhealthy, badly-"nourished, strumous child; quite unfit to cope with the "effect of vaccination." In my opinion it would have "succumbed to the first attack of any of the ills that in-"fants are liable to contract." "A first child with decided "mesenteric tendencies in my opinion should have had the "operation postponed." Dr. H. stated at the inquest that after death he found traces of inflammation of a low strumous character on the left forearm and right leg.

Family history. Bad. Dr. H. states "the father has a scrofulous history "and his appearance fully bears this out. The mother is "full of phthisis."

General surroundings. Unhealthy and unfavourable in the extreme.

Summary. E. L. H. was an unhealthy member of an unhealthy family. From such facts as I have been able to ascertain it would seem probable that she died from the effects of vaccinal ulceration followed by septic absorption from the wound.

THEODORE DYKE ACLAND, M.D.

CASE 122, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of M. O.: report to the Commission of Dr. Sidney Coupland.

I have inquired into the case of M. O., of ——, who died on the 13th March 1892, at the age of eight months; and of whom the certificate of death, signed by Mr. E. S., L.R.C.P., of ——, ran as follows:—"Pneumonia, six days; vaccination, 47 days; convul-"sions, duration uncertain."

Certified cause of death.

Account by the vaccinator. I called on Mr. E. S. on the 5th April 1892, and he informed me that he vaccinated M. O., then aged six and a half months, on Tuesday, the 26th January. He said that the infant, a male, was "very healthy," and was in the early period of dentition. He did not, however, think the fact of its teething sufficient to warrant postponement of vaccination, especially as small-pox was prevalent in the district at the time. According to his usual practice calf lymph was employed, namely, the special preparation known as "vaccine conserve" sent out by Dr. H., of ——, from his Calf Vaccine Institution. This material is sent out to practitioners in small opaque glass tubes or phials of about half an inch in length, and conical in shape, the wider end being hermetically closed by means of a small tightly fitting cork and wax. The "vial" contains enough of the lymph to serve for at least 50 insertions, so that Mr. E. S. would have the same sample in use for a period of several days.* He does not keep any register of his vaccinations, nor of the particular supply of lymph used on each occasion. It is therefore impossible to trace precisely the lymph used in the present case. From Dr. H.'s receipted invoices, it seems that Mr. E. S. had one "vial" of the conserve sent to him on the 16th, and another on the 22nd January; but he was unable to say whether the child M. O. was vaccinated from the latter or the former supply. He said that it was "quite possible" he might not have finished the "vial" of the 16th January by the 26th, and that the cases vaccinated on the latter date may have been done with the last portions remaining of that supply. He is not in the habit of re-sealing the vial after each day's use, but only re-inserts the cork, so that the possibility of its contents becoming contaminated with foreign matter would be enhanced the longer the "vial" was in use.

Source of lymph.

* I was informed by the Public Vaccinator of the district, as well as by Mr. E. S. himself, that the latter does "most of the vaccination" in the district, his fee being small, and the number of his insertions not exceeding two.—*S. C.*

As regards the method of vaccinating, he said that he generally uses (and he did so in this case) a clean sewing needle, with which the skin is scratched in cross lines; and the lymph applied by being rubbed vigorously in by means of the flat surface of the blade of a lancet. Two such insertions were made in this instance.

Course of vaccination. On the following Friday (the 29th January) the fourth day of vaccination he saw the child again, and found two large well-developed vesicles, but did not observe any unusual degree of irritation or redness; and accordingly he filled up the certificate of successful vaccination.

Illness following vaccination. The next occasion on which Mr. E. S. saw the child was on the 9th February, exactly a fortnight from the day of vaccination. The child had had a fit on the 7th, and its arm also had inflamed, so that on the evening of the 8th the father called and asked Mr. E. S. to come and see it. He states that he then found that there were two deeply excavated ulcers at the sites of vaccination, that the arm was swollen and reddened from the shoulder to the elbow, and there was a swelling in the axilla. He prescribed the application of lead lotion and milk to the arm and poultices to the axillary swelling, which rapidly enlarged. There was also extension of the cutaneous redness across the pectoral region, and the abscess, Mr. E. S. thinks, had burrowed beneath the pectoral muscle nearly to the sternum, before it burst spontaneously in the armpit under the continued poulticing. He had wished to incise it previously, but the mother objected. There was very free discharge of pus, which continued to flow in greatly lessened amount until the child's death. The cutaneous redness ceased to spread after the abscess began to discharge, and indeed it disappeared to a great extent. As the child seemed to be going on well, Mr. E. S. ceased his visits, after about 10 days' attendance.

Second and fatal illness. Mr. E. S. was again summoned on the 7th March as the child's breathing had become affected. He found it suffering from pneumonia of the left lung, which he attributed to some exposure on the previous day. It had a series of convulsions on the 8th, and the signs of pneumonia extended to the right lung, death occurring from exhaustion on the 13th March.

Account by grandmother of child. I next proceeded to the parents' house, and finding both of them absent from home I learnt the following particulars from Mrs. M., the maternal grandmother, who lives in one of the two back-to-back houses inhabited by the family. Mrs. M. said that this infant was the second born to these parents, the other being a healthy lad, 12 years of age. The parents enjoy very good health, and the deceased infant was also in good health up to the date of its vaccination. It had commenced to cut its teeth at this time, but it did not ail to any extent. Mrs. M. thought that the doctor rubbed in the lymph too vigorously, and said that "the places "went on too fast." The arm, she said, "was always "red from the first." Still she did not think it different from other vaccinations which she had seen, except that it formed too soon so that "matter formed by the 5th "day." The arm became very hard and red down to the elbow, the redness spreading across the breast, and under the arm, where a lump formed, which she thinks at first subsided on being poulticed, but then re-appeared and enlarged, so that when Mr. E. S. first saw it it was "as large as an egg." Mrs. M. said that the doctor wished to open it, but the mother would not let him, so they continued to poultice it until it burst, when a very large quantity of matter came away, and continued to discharge until the end, the opening into the abscess being "large enough to admit two fingers." She also spoke of the child's breath becoming short, but said that the only exposure it had had was in being carried from the one house to the other the day before its chest became affected.

Account by mother of child. I may here insert the particulars of an interview which I obtained with the parents of the deceased child on the 11th April, although they add little that is material to what is above recorded. They confirmed Mrs. M.'s statement as to the infant's previous good health. He had two teeth erupted. Mrs. O., the mother, noticed about the fourth day of vaccination that the child's arm was reddened from the vaccinated places down to the elbow, and about the end of the week the arm was swollen, and the vaccinated places were "full of matter." The child did not seem particularly ill. It was a "little cross," but continued to feed well (it was being partly nursed by the mother, partly fed with milk and whey). About 10 days after the vaccination the mother noticed a swelling in the armpit, and also observed that some discharge was escaping from beneath the scabs that had formed at the sites of vaccination. She consequently applied poultices to the arm. On the 7th February the child had a fit, and on the evening of the 8th Mr. O. called on the doctor to ask him to come and see the child. Mr. E. S. came on the 9th, and continued in attendance for about three weeks (see Mr. E. S.'s statement — 10 days?). The abscess which reached from the armpit across the breast gave vent to a very large quantity of matter which gradually diminished, but had not ceased to discharge when death occurred. In spite of this both parents aver that the infant did not lose flesh nor refuse food. As regards the vaccination places those remained apart, but enlarged in area, forming each a "raw surface" as large as a florin; and at one time they seemed as if about to heal. On the 1st March the infant had another fit, and on the 7th Mr. E. S. was sent for as its breathing had become difficult. On the 8th March it had a series of 10 fits, lasting from 3 p.m. to 4 a.m. next day. The breathing continued to grow worse. During the last week of its life the mother did not notice any material change in the condition of the arm.

Condition of dwelling. Mr. and Mrs. O., the father and mother, are each 33 years of age. They look very healthy and seem to be well educated, sensible people, answering questions frankly and willingly.* Their dwelling, although a back-to-back house, consisting of a sitting-room on the ground floor, and a bedroom on the first floor, is of recent construction, is very clean and well kept. It is well lighted and ventilated, although there is not of course any true "through ventilation." There are no drainage defects, and the occupants noticed no bad odours at the time of the child's vaccination. Both Mrs. M., the grandmother, and Mrs. O., the mother, assured me that there had been nothing in contact with the child's arm, and that it had not been accidentally rubbed or injured in any way before it became inflamed.

Co-vaccinees? On the 5th April I saw two children who were vaccinated by Mr. E. S. on the same day as the child M. O., although he is not certain whether they were vaccinated from the same "vial" of lymph "conserve" or not. One of these co-vaccinees, E. S., 8 years of age, presented on her left arm two large, circular, deeply depressed radiate scars, each about ¾ inch in diameter. There seemed in this case to have been an unusual degree of loss of substance, and the girl said that the scabs were very large, and the healing took from three weeks to a month. She had noticed some transient redness of the arm down to the elbow. The other co-vaccinee, A. H., 6 years of age, showed two depressed scars, the places having taken one month to heal. Their conjoined area was about ¾ of a square inch. There had been no complications in this case.

It is of interest in connexion with the use of this lymph and the mode of vaccinating employed to record that in another case, that of a re-vaccination in a girl, 16 years old, shown me by Mr. E. S. there were two unusually large adherent and tinch scabs on the arm.

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* They attribute their child's death to the vaccination, but did not like the publicity which had been given to the case. More than one person had called to inquire particulars as to the child's illness. I give below a copy of a placard extensively posted at ——— on the 8th April, in the interest of certain candidates in the election of the Board of Guardians then pending. Mr. O., the father, referred to this placard and asked how the certificate of death was obtained, as he did not furnish it. It may be noticed that the transcriber has used the word "pyæmia" instead of "pneumonia" in the original.—S. C.

BOARD OF GUARDIANS ELECTION.

Ratepayers, Read the following FACTS as to the effects of "Pure Calf Lymph" as recommended by Mr. C. A.:

M. O., aged eight months and two weeks, living at —— ——, —— was Vaccinated with pure Calf Lymph January 26th, 1892. He was quite well previously. His parents and all the other members of the family are quite healthy. One week after Vaccination he was taken ill, one arm being inflamed from shoulder to elbow, and a large lump formed under the armpit, he also had fits. He died on the 13th March last, and the Dr.'s Certificate gives the cause of death as follows:—

PYÆMIA - - (duration six days).
VACCINATION - - " 47 "
CONVULSIONS - - (Uncertain).

Thus the "PURE LYMPH" has again done its deadly work, and we have another promising and healthy child sacrificed to satisfy the fatal fad of the Vaccinator.

RATEPAYERS! *Do not be* MISLED *at this important crisis. Do not by a single vote make it possible for men to be elected as Guardians who defend such a pernicious practice. Show that you* REFUSE *to have your children thus legally sacrificed by* VOTING FOR

M., P.,
T., and V.,

who have so long fought on the side of Health, Right, and Liberty.

ON BEHALF of the —— ANTI-VACCINATION LEAGUE.

To summarise the facts of the case of M. O.:—

26th January. Vaccinated with Dr. H.'s calf-lymph conserve; two insertions.
29th ,, Certified by vaccinator as "successful."
30th ,, Redness of arm from vaccination sites to elbow.
2nd February. Arm swollen and red; "matter" in vesicles.
5th ,, Pus oozing from beneath scabs. Swelling in axilla.
7th ,, Convulsion.
9th ,, Seen by Mr. E. S. Large abscess in axilla and sub-pectoral region. Vaccination sites ulcerated. Arm inflamed.
12th ,, (about). Abscess burst, giving vent to large quantity of pus.
20th ,, (? later). Mr. E. S. ceased attendance.
1st March. Convulsion.
7th ,, Mr. E. S. again summoned. Signs of left pneumonia.
8th—9th March. Series of convulsions. Extension of pneumonia.
13th March. Death, the abscess continuing to discharge till end; and the vaccination sites occupied by deep unhealed ulcers.

The immediate cause of the child's death was pneumonia. This complication may either have been septic, dependent upon the suppurating inflammation in the armpit, or less directly associated with this disturbance, supervening in consequence of the enfeebled vitality due to the exhausting discharge. There is nothing to support the former hypothesis, but in the absence of a post-mortem examination it is impossible to be certain as to the relationship (if any) existing between the two conditions.

The evidence justifies the inclusion of "vaccination" in the death certificate; and it is important to determine, if possible, the reason for the phagedenic process at the site of the vaccination to which the large axillary abscess was secondary. I wrote to Dr. H. for information upon the preparation of calf-lymph used in this case and Dr. H. has informed me that he has never known of any bad arms occurring from the use of the conserve. He endeavours to impress on those using the lymph the importance of having it fresh, and attributes failures to the employment of minimal quantities. From an interview he had with Mr. E. S., he learnt that probably 14 other children were vaccinated on the 25th and 26th January from the same vial of converse, and that all did well. Certainly six were vaccinated from the same supply as was M. O., viz., in the forenoon of the day (26th January) on which M. O. was vaccinated; and the fact that these children did well renders it unlikely that the conserve itself was to blame for the inflammatory mischief in the case of M. O. But I would venture to suggest that there was no reason why the lymph should not have become contaminated after it left Dr. H.'s hands, since, as stated, no special precautions were taken by Mr. E. S. to avoid such contamination of a supply of lymph which sufficed for some 50 or more insertions. Nor can I commend the manner of vaccination employed in this and other cases, viz., the production of two unusually large vesicles rather than three or four smaller ones. It is to be regretted that the vaccinator, whose practice in vaccinations I am informed is even larger than that of the Public Vaccinators, does not conform to the regulations laid down by the Medical Officer of the Local Government Board, that he does not regularly inspect his cases on the eighth day, and that he keeps no systematic record of his vaccinations.

The early maturation of the vesicles in this case, and their rapid suppuration, point to the introduction of septic matter at the time of the vaccination. As this does not appear to have been due to the instrument used (a clean needle), I am compelled to attribute it to some added impurity of the vaccine.

SIDNEY COUPLAND, M.D.

CASE 123, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of P. S. An inquiry was made into this case by a Medical Inspector of the Local Government Board. The following is an abstract of his reports:

Local registrar's register contains entry of death on the 13th March 1892, of P. S., aged four months, certified as from "convulsions from exposure to cold whilst suffering "from vaccination." An inquest had been held on the body of the child, and the Deputy Coroner forwarded the death certificate to the registrar. Dr. Fletcher was directed to make inquiry, and reports to the following effect:—

He first saw Dr. D., the Medical Officer of Health, who had given evidence at the inquest, and on whose evidence the jury had based their verdict. Dr. D. stated that he told the jury that vaccination had nothing to do with the child's illness beyond predisposing it to catch cold through the feverishness, or constitutional disturbance, naturally following on vaccination. The day on which the child was taken to the vaccination station for inspection was, he pointed out, bitterly cold, and the child was carried to the station, a mile and a half away, through a snowstorm. He is of opinion that the child would probably have caught cold on such a day if similarly exposed when unvaccinated. So far as he could judge, the results of vaccination had been perfectly normal, but he did not see the child till after her death, in fact the child was not seen alive by any medical man after the day on which she was vaccinated, hence the parents' inability to procure a death certificate, and the Coroner's inquest.

Dr. Fletcher next visited Dr. R., the Public Vaccinator. An examination of his register showed that the deceased was vaccinated at the station on March 3rd from No. 81, viz., L. C., aged one year and two months, who was vaccinated at the same place on February 25th. Two other children are entered as having been vaccinated on the same day, but there were not any co-vaccinees from the same vaccinifer.

Dr. Fletcher visited and saw L. C., the vaccinifer, and found her to be a delicate child. The mother said that L. C. had not been well since she was vaccinated, but admitted that her daughter was ill before vaccination, in fact the operation had been postponed because the child had been suffering from whooping-cough. The child was vaccinated in four places, four vesicles developed and ran a normal course.

The two children entered in the register as having been vaccinated on the same day as that on which P. S. was vaccinated are named E. E. and E. M. F. R. Dr. Fletcher visited both these children and personally examined them. The mother of the former said her child was vaccinated some months ago, and it was certainly not (Dr. Fletcher considered) done so recently as March 3rd. There was only the one child, E. E., living at the address given in the register, and it appeared clear that the entry referring to this child must have been an error so far as the date of vaccination is concerned. The other child, E. M. F. R., was vaccinated in three places, of which two were successful, and the vesicles had run a normal course. The child has remained well throughout.

Dr. Fletcher also visited Mrs. S., the mother of P. S., the subject of this inquiry, who gave the following account:—The child was quite well up to the time when she took her to the station for inspection on March 10th. On arriving in the town where the station is situated, she took the child to her mother's (the child's grandmother's) house to warm her, and through this arrived too late at the station for the inspection. The child, however, was so cold that Dr. R.'s servant took her into the kitchen to warm her. The following day the child appeared to be in pain, and Mrs. S. thought her arm appeared to be troubling her. On the next day, the 12th, the child seemed ill and restless, and on March 13th she appeared to have a fit, and died shortly after, before Dr. D., to whom a message was sent, could arrive. Mrs. S. has had eight children vaccinated, and, so far as she could judge, this child's vaccination ran just the same course as did the vaccinations of her other children. She thinks her baby simply caught cold, and does not in any way blame the vaccination

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CASE 124, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of M. R. D. M.: report to the Commission of Dr. Theodore Dyke Acland.

First vaccination.

M. R. D. M., then aged two and a half months, was vaccinated on the 22nd February 1892 by Mr. F. W. McG., L.F.P.S., Glasgow, of ——. The vaccination was unsuccessful.

Second vaccination. On the 29th February 1892 by the same vaccinator.

Death. 14th March 1892.

Certified cause. "Phlegmonous erysipelas; vaccination."

Certified by Mr. F. W. McG.

Source of lymph. Mr. F. W. McG. informs me that he has only recently taken the practice at ——, and that when he first came he found a tube of lymph which had been obtained from the Institut de Vaccine Animale, 8, Rue Ballu, Paris. He says that he has no record of any kind as to the case of M. R. D. M., but that he has no doubt that he vaccinated her from this tube, which may or may not have been opened before he used it for this vaccination. The tubes are supplied in two sizes, one for four, the other for twenty vaccinations. He believes that he followed his usual course, which is to open a tube of lymph and to continue vaccinating with the lymph from day to day until it has all been used. This practice is indefensible on any ground, and is contrary to the directions for use which are printed upon each box in which the lymph is sent. I have not been able to satisfy myself as to whether the child was the first of the series to be vaccinated or what other children were vaccinated with the same lymph. In consequence, the information obtainable is very meagre and the details are uncertain, but the lymph presumably was calf lymph, although this is not guaranteed in any statement on the package.

The child, it should be noted, was twice vaccinated, so that it ran a double risk of being vaccinated with lymph previously exposed to the air.

Co-vaccinees. Uncertain. Application has been made to Mr. W. E. R., Vaccination Officer, of ——, in order to ascertain what certificates of successful vaccinations were given by Mr. F. W. McG. within a few days of that which was given to M. R. D. M., which is dated the 7th March. He states that four vaccinations were performed about this time:—E. M. E., E. G. L., A. M. H., and J. E. B.

Mr. F. W. McG. has inspected all these children since my visit, and I have not thought it necessary to see them myself, since, as he keeps no records, he could not tell me who they were when I was at ——, and there is no certainty that they were vaccinated with the same lymph. Vaccination in all these cases is said to have been normal.

Sub-vaccinees. None.

Course of vaccination and illness. The day following the second vaccination, the 1st March, redness was noticed by the mother round the points of insertion. The redness rapidly spread down the arm, and the vesicles did not form properly, although there was no suppuration round them, and one of them completely dried up before death. The rash which appeared was at first scarlet, and when it faded left discolouration behind it. A large blister formed upon the right thigh and buttock, which contained both blood and serum; another also formed on the left hand. The constitutional symptoms did not at first seem to be serious; the child had no sickness or diarrhœa, and continued to takes its food well until the day before its death. Both the mother and the monthly nurse, whom I saw, agree in stating that there was not any open sore on the arm. The child did not leave the house after vaccination, being attended at home by Mr. F. W. McG.

Treatment of vesicles. The mother states that she did not touch the vesicles, and that, as far as she knows, the arm was not rubbed or irritated in any way. No application was made to the arm or vesicles, except under medical advice.

General surroundings. I was unable to discover anything in the place or the rooms where Mrs. M. lived which was likely to have proved a source of infection. The house was beautifully kept, and Mrs. M.'s person and surroundings were everything that could be desired. The keeper of the Model Dwellings tells me that no case of infectious disease has been reported in the Dwellings, and she thinks it impossible that any such case could have occurred without being reported. The father, M., is a dock labourer who has been engaged only in loading cases of goods, and has had nothing to do with loading of offensive articles, such as hides, manure, &c., and I have been unable to elicit any information which would lead to the suspicion that infection might have been brought by him.

Family history. Nothing to throw light upon the case. There has been only one other child who died, it is said, of congestion of the lungs during the period of dentition.

Method of vaccination. As has been stated, Mr. F. W. McG. occasionally uses lymph which has been previously opened for his vaccinations. I have not been able to ascertain any other obvious fault.

Conclusion. The child died from erysipelas starting directly from the vaccination punctures. If this vaccination, as seems probable, was one of those done from lymph previously opened and exposed to the air the result would be sufficiently accounted for.

THEODORE DYKE ACLAND, M.D.

CASE 125, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

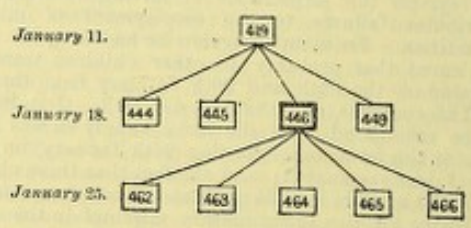
Case of G. A. S. An inquiry was made into this case by a Medical Inspector of the Local Government Board. The following is an abstract of his report:

Local registrar's register contains entry of death, on the 16th March 1892, of G. A. S., aged six months, certified by Mr. W., as from "septicæmia following vaccination, "42 days." Dr. Bruce Low was directed to investigate this case, and reports to the following effect:—

G. A. S. was vaccinated at the age of four months by Dr. M., Public Vaccinator, at the public station on January 18th, 1892. The child died on the 16th March, and the death was certified by Mr. W.

From Dr. M.'s register Dr. Bruce Low found that the child G. A. S., No. 446 in the register, was vaccinated with three others, viz., Nos. 444, 445, and 449, direct from the arm of an infant named C., No. 419 in the register, on January 18th. On the 8th day (January 25th) all the four children were brought back for inspection, and Dr. M. says all were free from undue areola. He selected G. A. S. as vaccinifer for five other infants, viz., 462, 463, 464, 465, and 466, and in addition he filled, he says, six tubes from the arm. These tubes, together with 12 others, filled from the arm of a co-vaccinee 445, he sent to the National Vaccine Establishment on the same day, January 25th. All 18 tubes were sent by the National Vaccine Establishment for use on board Her Majesty's ships on the South Pacific and South West African naval stations.

The following diagram shows the series of cases in question:—



Dr. Bruce Low visited each of the nine children associated here with G. A. S., and in each instance he found the child had made a good recovery in the usual time, having remained free from complication of any kind. The vaccination, he was assured in each case, was entirely normal. The vaccinifer C. is a fine healthy child whose mother stated that the vaccination in this case had run its course and mended better than in any of her other eight children. At no time had the arm been inflamed.

Dr. M. has been vaccinating for the last 30 years. He scratches with a bright lancet, which he carefully cleanses between each operation. The instrument is used for no other purpose.

Mrs. S. says her baby seemed quite well on January 18th, when she took it to the station. On the eighth day, January 25th, when she went back to show the arm, it was free from inflammation, and several other children were vaccinated from it. She applied a shield to the arm before leaving the station. On her return homeshe saw that the padding of the shield was wet with the discharge that had oozed from the punctured vesicles. She continued to keep the shield on the arm during the next few days. She did not remove the wetted padding nor renew it.

On the evening of the 26th January (the ninth day of the vaccination) she noticed the arm beginning to be red. This redness gradually extended up and down the arm, which became swollen and in some places hard. As the redness spread to the chest, she sent on Friday, February 3rd, the seventeenth day of the vaccination, for her medical man, Mr. W. Under his treatment an abscess, which formed on the forearm, broke about a week later, and

after this the arm began to heal. Progress thereafter was steady till March 6th, when diarrhœa and sickness came on. The child gradually wasted away and died on March 16th, the 59th day of its vaccination.

Mrs. S. has had four children. Her first infant died at the age of seven months from "wasting and convulsions," the second died when 13 months old from "water on the brain," the third (and only surviving) child is nearly two years old, but cannot yet walk. The fourth is the subject of Dr. Low's report.

The father of the family was suffering, when Dr. Bruce Low called, from an attack of epidemic influenza, which he said began about the same time that the baby was attacked by the diarrhœa (viz., March 6th). The parents and children occupied the same bedroom. No zymotic illness or case of a septic kind was known to have occurred in the house for some considerable time previous to the vaccination of the infant G. A. S. The house is occupied by several families, the S.'s occupying two rooms on the ground floor. Their rooms were clean and tidy, as also were their persons. The deceased infant had been fed with Mellin's Food, and a bottle and tube were used in the feeding. Mrs. S. had been unable to suckle any of her children.

Mr. W. says he was called in on February 3rd to see this infant. The arm was then inflamed. The forearm was tense and brawny. Pus exuded from the vaccinated places. In a week's time an abscess broke on the forearm, and after this Mr. W. says that, "so far as the arm was "concerned, improvement went on steadily" till March 6th, when the child was seized with diarrhœa and sickness; the purging continued, and the child wasted away, dying 10 days after this symptom appeared.

Mr. W. added that he attended the other two children of Mrs. S. that died. He says they died from "inanition." They were "simply unable to digest anything." The child G. A. S. (the subject of this report) had "septicæmia," in the opinion of Mr. W.

Case 126, reported to the Commission by Mr. J. H. Lynn.

Case of W. F.: report to the Commission of Dr. Theodore Dyke Acland.

W. F., aged six months, of ——, was vaccinated privately on the 13th January 1892 by Mr. R. B., L.R.C.P. Edin., at his surgery at ——.

Dr. R.'s calf lymph, obtained from Messrs. K. and Co., of ——. Mr. K. informs me that he obtains the lymph direct from Dr. R. two or three times a week, and they never have any in stock for more than a week, so that it is always fresh. Mr. R. B. keeps no record of his cases of vaccination, so that he is unable to tell me at what date he obtained the lymph used in the case of the child W. F., neither is he able to give me any information as to who was vaccinated on the same day or from the same lymph. The only certain facts that I was able to ascertain were that he often vaccinated two children from the same tube of lymph. But he never keeps a tube after it has once been opened. Mr. K. informs me that on the 13th January he supplied Mr. R. B. with two tubes of R.'s lymph, invoice No. ——, 8.1.92., and there is reason to believe that this was what was used on the 13th January.

Uncertain. Mr. H. C., of ——, Vaccination Officer, however, informs me that the following certificates, six in number, of successful vaccination were signed by Mr. R. B. on the 20th January: A.M., of ——, K. R., of ——, M. H., of ——, F. B., of ——, B. M. R., of ——, and E. J. W., of ——. From Mr. E. B., of ——, Vaccination Officer, I learn that the only case of successful vaccination certified by Mr. R. B. in his district on that date was that of A. W., of ——. There is no means of ascertaining how many or which of these children were vaccinated from the same tube as W. F., neither is it possible to say what lymph any of them were vaccinated from seeing that only two tubes of calf lymph were supplied to Mr. R. B. on the 13th January, and he assures me that he only vaccinated two children from one tube. Under these circumstances the only course was to see them all and note the general result of the vaccinations.

Of the seven cases mentioned above five did well. Each of them presents one normal scar, and none of them suffered from eruption on the body, enlargement of the axillary glands, or excessive inflammation round the vesicles. Of the other two:—

B. M. R. suffered from a considerable abscess in the axilla, which commenced during the second week and continued discharging about 14 days. There was no general eruption, and no other inflammation. There is now one large puckered scar, and the child is well.

K. R. got the scabs rubbed and the healing of the vesicles was in consequence delayed. There was no excess of inflammation, and no enlargement of axillary glands.

Sub-vaccinees. None.

Course of vaccination. Vaccination was performed in one place only. The vesicle was, according to the mother, normal up to the eighth day. Mr. R. B. does not recollect any details. For three weeks the child's progress seems to have been satisfactory. During this time the mother went with her child to her own home, a place about 10 miles off, returning a week before the child's illness commenced. Within a day or two of their return home the scab came off the vesicle, leaving an open ulcer which discharged a small amount of pus and scabbed over again. I have been unable to ascertain whether the scab was knocked off or received an injury during the move, or whether it fell off in consequence of suppuration beneath it, but from this time the wound began to take on the unhealthy action which culminated in phlegmonous erysipelas.

Course of illness. During the night of Monday, the 8th February, Mrs. F., the mother, noticed that the child was restless and cried when she took it up, and she found that the night-dress was sticking to the wound on the arm. Next morning the child was more irritable, and about 8 a.m. became convulsed. Dr. B—n was sent for, and he found that the vesicle had been injured, but as there was no sign of any inflammation round it, he did not connect the convulsion with the condition of the arm. He says that he is sure that there was no definite redness round the vesicle for 48 hours after the convulsion, but the mother thinks it began during the same day. They both, however, now believe that the convulsion indicated the commencement of the acute febrile attack which followed. The arm became rapidly inflamed, the redness and swelling gradually extending over the body and to the extremities. As the erysipelas subsided, sub-cutaneous collections of pus formed and had to be evacuated by incisions through the integuments. Mr. R. B. thinks he made eight or ten openings which discharged pus and then quickly healed. The incisions have all been made on the extremities, except two on the buttocks. All the wounds are now (29th March 1892) healed and there is not any swelling of axillary glands, though the mother says that at the time the erysipelas was at its height they were very much enlarged. The extensive inflammation and suppuration seriously affected the child's general condition, it became much exhausted, and at one period Mr. R. B. believed it to be suffering from peritonitis.

Treatment of vesicles. Up to the fourth week no application was made to the vesicles; they were, however, covered with a linen sleeve and the frock came over this, in order to protect the arm, as the child was often out in the cold. No shield was used, and the vesicles were not knowingly rubbed. On the 9th or 10th February, when the arm first began to be inflamed, poultices were used; with this exception all treatment seems to have been carried out under Mr. R. B.'s orders. There is now one healthy vaccination scar and several scars at the point of the incisions. The child's general condition on the whole is satisfactory; it is rather anæmic, and there is a tendency to those spasmodic movements, known as carpo-pedal spasms, which frequently occur in children whose nervous systems are easily excited. There is some evidence of rickets, such as beading of the ribs, large occipital protuberances, enlargements at the ends of the radii, and sweating of the head during sleep. There is, however, no diarrhœa, and the child is taking its food well.

Method of vaccination. Mr. R. B. is not a Public Vaccinator, and his procedure is unsatisfactory in two respects; in the first place he keeps no record of any kind as to the source of lymph, co- and sub-vaccinees, &c., and in the second place he makes one small vesicle only. In neither case does he carry out the spirit of the instructions issued to Public Vaccinators, and in none of the cases which I saw, for which certificates of successful vaccination had been given, was the area of vesiculation equal to the

half square inch, which is recommended in the same instructions. It must, however, be added that though his method is faulty I was unable to trace any connexion between it and the cellulitis in the present case.

Previous history. Good.

Family history. Good.

General surroundings. Satisfactory. I was unable to elicit any information as to the presence of contagious disease in or near the house.

Sanitary surroundings. I was unable to detect any gross sanitary defect; the sink discharges over an open gulley; the closet is apart from the house. There was no offensive smell, and the house and surroundings were fairly clean.

Summary. The child suffered from phlegmonous erysipelas, which spread from the vaccination wounds. Vaccination appears to have proceeded normally until the third week, when the scab came off leaving an open sore; a week later the scab which had formed was injured and within two days erysipelas commenced. In the absence of any record of co-vaccinees no assistance can be gained from the history of the children vaccinated on the same day; but from the facts obtainable it would seem probable that the exciting cause of the erysipelas was due to injury to the scab and not immediately to the vaccination which had been performed a month previously.

THEODORE DYKE ACLAND, M.D.

CASE 127, REPORTED TO THE COMMISSION BY MR. J. H. LYNN.

Case of J. E. W.: report to the Commission of Dr. Theodore Dyke Acland.

Vaccination. J. E. W., of ——, was vaccinated on the 1st February 1892 by Mr. W., who was acting as *locum tenens* for Dr. M., who was absent through illness.

Co-vaccinees. No record.

Sub-vaccinees. No record.

Source of lymph. No record of any kind is kept, so that the source of lymph, co-vaccinees, &c., are unknown; but Dr. M. informs me that he believes that the lymph came from M. L., of ——.

Course of vaccination. Both Dr. M. and the mother agree in stating that the vaccination pursued a normal course. The scabs healed well and completely; there was no excess of inflammation and no enlargement of the glands in the axilla. At the time of the vaccination a vesicle formed upon the back of the right hand, which developed simultaneously with the vesicles on the upper arm, and healed simultaneously with them. This point apparently was inoculated at the time of vaccination, but whether by the child rubbing the back of its hand on the vesicles whilst the lymph was still wet, or whether, as Mr. W. supposes, by his accidentally scratching the hand while he was vaccinating, there is no evidence to show. Mrs. W., the mother of the child, assures me that she has no doubt that it was the same in character as the vaccination pocks.

Course of indisposition. Nothing occurred to lead the mother even to suspect that anything was wrong until five weeks after vaccination, when the child began to suffer from the effects of dentition. It began to be fretful and irritable; thrush appeared in the mouth and some redness round the anus. This condition continued for about a week before the eczema, from which it has since suffered, commenced. The vaccination scars remained completely healed, and showed no signs of being the starting point of the skin eruption.

Condition, April 1st, 1892. At the time of my visit, on the 1st April, I found the child suffering from a rather severe attack of eczema. This began on the face and spread rapidly over the head. There were various healing eczematous patches on abdomen, arm, and neck; and there was a small abscess on the right side of the neck, doubtless due to the eruption of eczema. The vaccination scars are normal, and there is no evidence to show that they have at any time been otherwise than healthy. There was no swelling in the axilla, and no rash on the body, except that of eczema. The child was well nourished and in good condition considering that it was both teething and suffering somewhat severely from eczema.

General surroundings. The conditions under which the child was living were very unwholesome. Two other children were ill in bed in the same room, which was suffocatingly hot and ill ventilated. In fact the child's surroundings were such as would be likely to increase the irritation of the disease from which it was suffering.

Conclusion. The child has been suffering from eczema, which commenced with the onset of dentition. There is no evidence to show that vaccination was in any way the cause of the attack. The course of the vaccination was normal, the wounds had entirely healed for some considerable time before the eczema commenced, and the eruption did not start from the points of inoculation. Under these circumstances it did not appear to me that any useful purpose could be gained by making further inquiries into the case.

THEODORE DYKE ACLAND, M.D.

CASE 128, REPORTED TO THE COMMISSION BY THE MOTHER OF THE CHILD.*

Case of M. W.: report to the Commission of Dr. Thomas Barlow.

M. W., aged 10 years and five months, daughter of Mrs. M., of ——. The mother, Mrs. M., gave evidence before the Commission on the 30th March 1892,* and the child M. W., to whose case Mrs. M.'s evidence related, was afterwards sent to me for inspection.

Condition, 6th April 1892. Condition of M. W. when examined by me on the 6th April 1892. The child is rather undergrown, but, with the exception of the skin lesions to be presently described, she is not badly nourished. Her teeth are crowded; she has large tonsils, and some enlarged hard glands in the neck. There are four vaccination scars, well foveated, about half an inch each in diameter, on the right shoulder; there is no sign of ulceration; the skin in their neighbourhood is healthy; and there are no enlarged glands in the adjacent armpit. In various parts of the body there are extensive cicatrices, indicating deep past ulceration with much loss of substance; some of these go down to the bone, to which they are adherent. The following are the situations:—

There is a deep scar on the left cheek with some overlapping pieces of redundant skin; there is a scar under the chin two inches long, and a scar on the left side of the neck.

Left arm. There is one scar on the inner aspect, the size of half a crown; one in the lower third, the size of a shilling; one, which is much puckered and adherent to the outer condyle of the humerus; one adherent to the inner condyle of the humerus; one adherent to the olecranon. There is some limitation of movement of the elbow. There are three scars occupying the upper and middle thirds of the forearm, one of these adherent to the bone; one on the back of the fifth metacarpal bone; one over the second, and one over the third metacarpal bone. The metacarpal bone of the thumb has ulcerated away. There is redundant skin at the base of the thumb.

Right arm. There is one large scar with redundant skin, not adherent to the bone; one adherent to the bone just below the olecranon. The elbow movement is good. There are two on the forearm; one over the metacarpal bone of the index finger adherent to the bone. The metacarpal bone of the thumb has ulcerated away.

Right thigh. There are two large cicatrices, one on the inner and one on the outer aspect; one just below the knee; one just below the ankle; two over the metatarsal bone of the big toe. A considerable portion of the metatarsal bone has ulcerated away.

Left thigh. One on the outer side.

Left leg. One on the front and outer side of the leg, partly adherent; three over the outer ankle. The metatarsal bone of the left big toe has ulcerated away.

The *heart* and *lungs* are natural. The child is subject to chronic diarrhœa, and had some hæmorrhage from the bowel when she was brought to me to be examined.

Family history. Concerning the history, the only remark which I desire to add to that which was elicited before the Commission is

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* *The Commission examined a witness, the mother of the child M. W., as to this case. See minutes of evidence of Mrs. Margaret Moslin, appended to the Commission's Sixth Report, Questions* 21,284-327.

the mother's statement that M. W.'s father (Mrs. M.'s second husband) died from very rapid lung disease (three months' duration), aged 42.

Concerning the vaccination, I have ascertained from Dr. C., of ————, who was the vaccinator, that M. W., aged three months, was vaccinated from N. R. on the 9th February 1892, and four others were vaccinated from the same source. H. R., of ————, was vaccinated on the 16th February from M. W.; she was the only one vaccinated from that source; the results were good, so far as is known. At this interval of time it is impossible to trace them.

The vaccination sites are normally foveated, and show no evidence of ulceration, and the skin in their vicinity is normal. The mother gives no history of any abscess in the adjacent armpit, and her statement indicates that the course of the vaccination was quite normal. It is impossible to speak positively as to the nature of the very deep ulcerations which, according to the mother's statement, began with a small lump under the chin about three months after the vaccination places had thoroughly cleared away. They appear in some places to have extended down to the bone and to have led to extensive destruction of bone. They now appear to be entirely healed in every case.

Three views may be taken of the nature of these lesions: namely, that they may be due to (1) *inoculated syphilis*, or (2) *septicæmia*, or (3) *tuberculosis*.

(1.) *The syphilitic theory.* In favour of this is the symmetry, the signs of deep ulceration, and yet ultimately complete cicatrisation. Against it is the evidence that the progress of the vaccination itself was normal, and that there was no subsequent thickening of the vaccination sites, so as to take on the character of a hard chancre. Moreover, there is an absence of history pointing to any generalised, mottled, or scaly rash following five or six weeks after the vaccination. These two features have been striking and constant in the conclusive cases of recorded vaccinal syphilis, and their absence appears to me, in the light of clinical experience, to negative the syphilitic theory in the present case.

(2.) *The septicæmic theory.* Multiple disseminated abscesses have occurred in several cases as a sequela of vaccination. In the cases that have come under my observation where such sequelæ have appeared to be in direct relation to the vaccination there has generally been some sign of severe local disturbance about the vaccinated arm either within a week of the vaccination or shortly after the removal of the lymph on the eighth day. It is noteworthy that in the present case, so far as can be ascertained, the progress of the vaccination itself was normal. The mother states in her evidence (in answer to Questions 21,293–4) that the child was not ill, except that the arm was a little inflamed; that she did not think anything of it except that it would die off; and that the vaccinated arm got quite well and all the five places healed. She informed me that to the best of her belief all the places were healed by the end of the month; that the scabs had come off and had not left sore places. It is in harmony with this statement that the vaccination cicatrices show no signs of ulceration, and that no abscess in the armpit appears to have formed. The first of these remarkable lesions appeared under the chin *three months after the vaccination*. Also this first lesion came like a little pea, and was evidently very slow in its formation. The above sequence is quite unlike the beginnings of septicæmia from vaccination so far as I am acquainted with it. I do not think chronic septicæmia can be absolutely excluded; but, if this case belongs to that category, it is entirely exceptional so far as its early stages are concerned; and the first manifestation was after so long an interval that it leaves open the possibility of other sources of disease having been introduced.

(3.) *The tuberculosis theory.* The multiplicity of the lesions, their symmetry, and their relations to the bones in many places are quite consistent with a form of tubercle which is not rare in the children of large towns. The complete separation of portions of the metacarpal bone of the two thumbs, and of the metatarsal bone of the two big toes, with the subsequent repair of the tissues around, is a feature which I have several times seen in connexion with multiple tubercle, or "struma" as it is more commonly called. In harmony with the tubercular theory is the fact that the child has chronic enlargement of the lymphatic glands in the neck (scrofulous glands). I think also that the rather severe bleeding from the bowel, which the mother tells me has occurred at intervals for several months past, and of which I saw an instance, is compatible with tubercular ulceration. It is also important to recall the mother's statement to me that her second husband (the father of this child) died, aged 42, from acute lung disease of three months' duration. This was probably tubercular phthisis.

My opinion is that the balance of evidence is in favour of the lesions in M. W. having been due to tubercle. Provisionally accepting that view, is it probable that tubercle was inoculated at the time of vaccination? I do not think the history is in favour of such a conclusion, chiefly because the vaccination sites do not appear to have at any time taken on anything suggestive of a tubercular character, and further, because there does not appear to have been any sign of tuberculosis of the lymphatic glands in the armpit adjacent to the vaccination. If it be said that the explanation of the entrance of tubercle is not forthcoming, it may be replied that the same difficulty continually occurs in cases of disseminated tubercle, resembling the present one, removed in their period of commencement by many years' interval from the time of vaccination.

THOMAS BARLOW, M.D.

CASE 129, REPORTED TO THE COMMISSION BY MR. J. H. LYNN.

Case of J. S. N.: report to the Commission of Dr. Theodore Dyke Acland.

J. S. N., then aged five months, was vaccinated on the 1st September 1891, by Dr. V., of ——, at the public vaccination station. *Vaccination.*

Impetigo; stomatitis; eczema. *Result.*

Direct from the arm of F. P., of ——. *Source of lymph.*

F. P. is a large healthy infant now (8th April 1892), aged one year. The mother informs me that she noticed nothing abnormal about the vaccination. There was no undue inflammation round the vesicles, no enlargement of the axillary glands, and no eruption. There are now four healthy-looking scars, one smaller and more faint than the others. There is no evidence of inherited syphilitic taint, the skin is clear, there are no condylomata about mouth or anus, no enlarged axillary or cervical glands. The teeth which have appeared are regular and well formed. The child's nutrition is excellent, and its health from birth has been good. He is the youngest of nine children (the result of nine successive pregnancies without any miscarriage intervening), all of whom are living. There is nothing either in the history of the child's vaccination or in its present condition to show that it was not in every respect a proper one to choose as a vaccinifer. *Vaccinifer.*

Ten other children were vaccinated on the same day from F. P. *Co-vaccinees.*

(1.) F. W. H. (No. 252 in the register.) Vaccination normal. No undue inflammation round vesicles, enlargement of axillary glands or eruption. The arm was completely healed in three weeks, and there are four healthy scars without induration.

(2.) C. C. (No. 253.) Vaccination was normal without undue inflammation, enlargement of glands of general eruption. There are four healthy scars without any induration. The child is suffering severely from rickets.

(3.) E. H. (No. 254.) Vaccination normal, without undue inflammation, enlargement of axillary glands or eruption. The vesicles healed well and quickly. There are four healthy-looking cicatrices without any induration. The child's general condition is good.

(4.) E. M. G. (No. 255.) Vaccination normal; the arm was well in a month. There has been no rash on the body, and no enlargement of axillary glands. The child seems well. There are four healthy scars without any induration.

(5.) D. T. (No. 256.) Was away from home. The next door neighbour, Mrs. E., who had seen the child frequently, informed me that there had been no trouble about its vaccination, and that the arm had healed well and quickly.

(6.) H. R. (No. 258.) Vaccination normal. No excess of inflammation, induration of glands, or rash. There are four small but healthy-looking scars.

(7.) E. P. (No. 259.) Vaccination normal. Two of the vesicles were placed too close to one another, and

coalesced without (so the mother informs me) any excess of inflammation. She had no trouble with the arm, which was completely healed in a month. The child's health has been good until quite recently; it is now troubled by the effects of dentition, and it is probably suffering from whooping-cough.

(8.) N. S. (No. 260.) Vaccination normal. The mother informs me that the vesicles healed well and quickly. There was not any rash or enlargement of glands. The child is well. There are four cicatrices, small but healthy, and without induration.

(9.) W. A. D. (No. 257) and (10.) B. N. B. (No. 261.) The parents of these two children have left their homes, and the children could not be traced by the Vaccination Officer.

Sub-vaccinees. None.

Course of vaccination and illness. Both Mrs. N., the mother of the child J. S. N., and Dr. V. agree that the vaccination pursued at first a normal course. It is uncertain at what period abnormal symptoms were noticed, Mrs. N.'s statements being confused and often contradictory. It seems, however, that the arm went on well for some weeks, probably for five or six. Subsequently the pocks began to discharge a thick purulent secretion, which dried over them in scabs How far cicatrisation had proceeded by this time is uncertain. Mrs. N. states that the scars broke down; later the pocks coalesced, and from their appearance at the time of my visit, on the 8th April 1892, it would seem that there must have been a considerable amount of inflammation round them. The child was first taken to Mr. R.'s, a chemist's, at ——. Here he was attended by Mr. H. S., M.R.C.S., who informs me, in answer to my inquiries, that he has no report to make upon the subject, and I have been unable to elicit any reliable information from him or from Mr. R. The child was subsequently attended by Dr. V., who states that he endeavoured without success to prevent Mrs. N., the mother, from poulticing the child's arm as she had been doing; and that he attributed much of the irritation of the vesicles to the method of treatment adopted. I am indebted to him for the following notes of the case:—

"15th April 1892.

"I cannot tell you whether the vesicles had cicatrised " before they broke down. When I went to see the " child, at the place of vaccination there was a large mass " of scale coalescing together with ichorous discharge " issuing from it; it was then being poulticed, and it " seemed to me that the mass had been formed through " poulticing and drying alternately; there was nothing " like induration either there or in the axilla. There was " eruption scattered all over the child on the scalp, fore- " head, face, thighs, and belly, generally of small groups " of pustular bodies containing caseous or cheesy matter " with a depression in the centre of different degrees of " hardness; in fact, they were just what I have seen over " and over again and known as molluscum, although I do " not think I have ever seen a case of so much of it, or in " so young a child. What confirms me in my diagnosis " was that it got better under the treatment of being " powdered with oxide of zinc, and numbers of the " pustules dried up and fell off. I remember when I left " attending the case all those on the head had done so, " the site of vaccination had ceased to ulcerate, in fact it " was doing well; but when I went again the child was " horribly dirty, and a mass of poultice on its arm. On " my remonstrating with her she was very abusive, and I " went no more."

On the 5th January the child was taken to the North-Eastern Hospital for Children. There she was treated for impetigo, stomatitis, and eczema of the arms. Dr. Pasteur has allowed me to make use of the following notes of the case:—

"The North-Eastern Hospital for Children,
" Goldsmith's Row, Hackney Road,
" London, N.E.

" No. ——. Diagnosis on Out-patient letter: Impetigo; " stomatitis; eczema of arms. Vaccinated when six " months old; first seen here on January 5th ult. Marks " healed completely in *six weeks;* remained healed for " *three weeks*, and then broke out afresh on the vaccina- " tion spots; after this red papules sprang up over arms " and right thigh, becoming pustular on red raised inflamed " bases, scabbing off and leaving dull red smooth stains, " now not appreciably raised, with smooth dotted scars in " several places. There is a condition of chronic eczema " with redness and thickening of skin on extensor surface " of left forearm and elbow, a few red papules and small " vesiles on right arm (recent), and a few papules on left " shoulder. In situation of vaccination scars there are two " large irregularly oval purplish-red punctate scars, very " similar to those on the right thigh and right cheek; there " are no marks or scars of any kind on the trunk (front " and back), which has remained unaffected throughout. " The pustules on the thigh and face did not appear for " *three or four days after* the vaccination marks 'broke out " again.' The child is strong, healthy, and well nourished, " but on the way to become rickety, and to my mind " presents the appearance of having suffered from *impetigo.* " The tongue, which was seen subsequently to above, " presents a remarkable condition. Smooth, slightly- " raised patches appear on it about once a fortnight (con- " sisting apparently of hypertrophied papillæ covered " with fur) and clear off completely in the course of a few " days, without leaving any mark. The patches on the " tongue do not resemble syphilitic eruptions. The lips " are quite free and the anus natural.

" 22nd April 1892. W. PASTEUR."

Present condition. When I saw the child on the 8th April it was fairly well nourished, and seemed bright though rather irritable. On the right arm at the point of vaccination there had been evidently a good deal of suppuration. The scars are confluent, the four original pock marks forming two separate areas; the two upper forming one and the two lower another. There are also two superficial scars below the vaccination marks. On the left arm from shoulder to elbow there is a papular eruption, due to eczema. The right thigh is covered as far as the knee with numerous dusky superficial scars, and there is one small puckered scar said to be the orifice of an abscess which has discharged. On the left thigh there are some similar scars, and also on the right cheek. The cervical glands are shotty. The axillary glands cannot be felt. The child's general condition is now satisfactory, although it has evidently suffered severely from a widely spread inflammatory eruption. There is ample evidence to show that this was due to impetigo, and was not syphilitic, as I am informed has been stated by the father.

Family history. I was unable to obtain any information as to the family history, previous history, or general surroundings which seemed to throw any light upon the case.

Conclusion. The case is one of impetigo excited primarily by the irritation of the vaccination, and further aggravated by improper treatment of the pocks. There is no evidence to show that the infection was inoculated at the time of vaccination, or that it was derived from the vaccinifer.

THEODORE DYKE ACLAND, M.D.

CASE 130, REPORTED TO THE COMMISSION BY MR. J. H. LYNN.

Case of C. P. G.: report to the Commission of Dr. Theodore Dyke Acland.

Vaccination. C. P. G., of ——, was vaccinated, when four months old, by Mr. F. J. O. on the 9th March 1892.

Source of lymph. From the arm of a child T., of ——. The lymph, which was stored in capillary tubes, was taken on the 3rd November 1891.

Vaccinifer. The vaccinifer in this case died on the 23rd January 1892. The certificate of death given by Mr. K., of ——, being "bronchitis and congestion of the lungs." Up to the time of its fatal illness the child is said to have been healthy; the arm healed well without any application to it, and the woman, E. N., who nursed it during its illness, states that the wounds had entirely healed for at least three or four weeks, if not more, before the child died. The illness was an acute one, lasting only about a week, and there appears to be no doubt that it was some sort of inflammation of the lungs.

Co-vaccinees. Two.

W. J. T. is a large healthy-looking baby, and according to his mother is in excellent health. There is one small rather glazed vaccination scar, but the child has had no eruption and no enlargement of glands.

P. W. D. is a fairly healthy child, but is living in filthy surroundings. There are two small cicatrices without induration; the child has had no eruption and no enlargement of glands.

Sub-vaccinees. None.

Course of vaccination. Mrs. G., the mother of the child C. P. G., informed me that on the eighth day after vaccination there was hardly

anything to be seen, and that the vesicles were not really well formed until the 14th day. About this time some eruption began to appear on the head and the vaccinated arm began to inflame. The inflammation, however, did not reach to shoulder or elbow. The child subsequently suffered rather severely from eczema of the head, for which it had been under medical treatment at the —— Hospital under the care of Dr. D. At the date of my visit (4th May) there were still the remains of some eczematous eruption on the right side of the scalp, and some eczema of the arm; the points of inoculation looked as if they had been badly rubbed, which the mother said was the case. The child, when I saw it, had on an Indian-red frock, the sleeve of which, with certain movements of the arm, irritated the wounds, and the edge of which was covered with discharge from the wounds which were still unhealed. There were three marks at the points of inoculation, one of these, the upper and outer one being much larger than the other two and covered with a thick crust.

The general surroundings of the child are extremely dirty and untidy, and, although it is certain that much irritation has been excited at the point of vaccination, I believe this is largely, if not entirely, due to want of care and attention on the part of the mother.

The child has suffered from eczema following upon vaccination, and doubtless aggravated by the irritation of the vaccine vesicles. From the condition in which the child was when I saw it there can be no doubt that the child's condition is in great part due to the mother's negligence.

THEODORE DYKE ACLAND, M.D.

CASE 131, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of E. M. G.: report to the Commission of Dr. Theodore Dyke Acland.

E. M. G., of ——, was vaccinated, when nine weeks old, by Mr. S. S., of ——, on the 29th May 1890.

Uncertain. Mr. S. S. cannot state positively whether it was from the calf or not.

Two. P. and B. I visited both these children on the 20th April 1892.

P. Vaccination normal. One normal cicatrix. The child is well.

B. Vaccination normal. Two normal cicatrices. There has been no undue inflammation and no enlargement of glands.

None. Lymph was taken from the arm in a capillary tube. It was not, however, used and Mr. S. S. has given it to me.

Up to the eighth day vaccination pursued a normal course. The pocks were seen by Mr. S. S., who considered them normal. According to the statement of Mrs. G., the mother of the child E. M. G., a few days after the child was inspected a small abscess formed. This abscess was never larger round than a sixpence. It was poulticed and discharged for two or three days. It was about three-quarters of an inch above the scars, which were two in number and side by side. Although the abscess discharged, the suppuration never reached the vaccination vesicles, which healed well. There was not at any time suppuration underneath the scabs over the vaccination wounds. It is unfortunate that (so far as I can ascertain) no doctor saw this abscess. Mrs. G., the mother, states that she showed it to Mr. S. S., but he has no recollection of her having done so. It healed so well that apparently it gave Mrs. G. no reason for apprehension.

From about the middle of June 1890 (at which date the arm was entirely healed) up to August 9th the mother did not suspect that anything was wrong with the child, except that it did not seem to be in very good health.

Early in August the corner of the child's right eye became inflamed, and on the 9th August she was taken to the —— Dispensary, at ——, where she was seen by Mr. E., the resident medical officer. The entry in his out-patient book is "abscess." He informs me that he is quite sure that the abscess referred to was a lachrymal abscess, and this statement is confirmed by the mother. This lachrymal abscess was on the *right* side, the abscess on the vaccinated arm having been on the *left* arm.

The child was treated for some weeks, but as she did not get on well Mr. E. advised that she should be taken to the Children's Hospital, into which she was admitted on the 15th November 1890. According to the hospital notes she was admitted for right lachrymal fistula, enlarged right submaxillary glands, and enlarged cervical glands. The lympathic glands and the submaxillary abscess which formed were subsequently scraped. She suffered later from blepharitis of both eyelids on the right side, and it was suspected that there was some necrosis of lachrymal bone. The case was looked upon as an ordinary case of multiple strumous abscesses. As far as I can learn from Mr. McL., the resident medical officer, no complaint was made about vaccination, and nothing was noticed to be wrong with the vaccination scars, neither was there any abscess connected with them. The child remained in the hospital until the 29th January 1891, when, as she did not make any progress, she was discharged, and has not since been readmitted.

Subsequently the child was attended at the Eye Hospital by Mr. C., who is stated to have marked the admission ticket as "injuries through vaccination." I have seen the ticket, and it contains no such statement. Mr. C. informs me that he first saw the child E. M. G. on the 5th May 1891. She was then stated to be 13 months old, and, according to the notes that were made at the time, she was suffering from strumous conjunctivitis with lachrymal abscess, sinus over parotid gland, lymphadenitis of glands of neck, cutaneous abscesses of buttock, calf, and elbow, with some swelling of the face. A history was given of blood-poisoning after vaccination and notes of the statement were taken down, but Mr. C. made no sort of agreement to the statement either verbally to the friends of the patient or in his notes of the case. She continued under treatment by Mr. C. and Mr. O., his house surgeon, until the 8th March 1892.

On the 28th March 1892 the child was admitted into the —— General Hospital, under the care of Mr. D., for strumous glands in the neck and strumous conjunctivitis. She remained in the hospital till the 16th April, when she developed symptoms of scarlet fever, and was removed to the fever hospital, where she now is.

Treatment of vesicles. I was unable to obtain any information which would lead me to suppose that the vesicles pursued other than an entirely normal course. No treatment was adopted for them, and it was only after the formation of the abscess on the upper part of the arm that a poultice was applied, and, notwithstanding the poulticing, the vesicles did not break down.

Condition, April 20th, 1892. I visited the child on the 20th April 1892 in the Fever Hospital, where she was at that time under the care of Dr. P., suffering from scarlet fever. On the left arm there were two slight and apparently healthy vaccination scars. There was no sign of there having been any undue inflammation round them or sloughing of the pocks themselves; and no sign of any orifice above the vaccination scars through which an abscess might have discharged. It is so long since vaccination that it is impossible to attach much importance to the appearance of the arm now, except in so far as the evidence tends to confirm the statements of both the mother and of the doctors who had attended the child, viz.:—that the vesicles themselves healed well and without loss of tissue. The child at the date of my visit had extensive suppuration of the cervical glands on the right side of the neck. She had also a lachrymal abscess on the right side. There were scars such as might occur from suppuration on the right thigh, the left calf, the right elbow. These places had all ceased to discharge and were practically healed; but there had evidently been considerable suppuration and inflammation of the parts affected. The child's general condition was fair, considering the protracted nature of the illness. It may be mentioned, incidentally, that since vaccination the child has also suffered from German measles and whooping-cough.

Method of vaccination. Mr. S. S. assures me that he uses every possible precaution in his vaccinations both in selection of his children and the method of performing the operation. I have had no opportunity of seeing him vaccinate, as his cases are private.

General surroundings. Fairly satisfactory. The mother has been a nurse, and although her strength has been greatly tried by the constant illness of the child her room was fairly clean, and there was nothing in the condition of the house to throw any light upon the nature of the case.

Family history. The mother is a delicate woman. The father is said to be healthy. There is only one other child, now five and a half months old. It is anæmic with some evidence of rickets and with enlarged cervical glands on both sides of the neck. One sister of the mother died of rapid consumption when 26. I was unable to

discover that any other members of the family had suffered from tubercular disease.

Conclusion. The above facts show that the child is suffering from some chronic infective disease. Whether the affection is merely the local expression of a tubercular tendency, and the case one of strumous abscess, as has been supposed by all the medical officers of the various institutions under whose care the child has been, or whether the abscess which formed above the vaccination wounds was connected with the vaccination, and the case one of chronic septicæmia originating from it, is a question which depends for its solution upon the history of the case. If the facts as I have been able to ascertain them are correct and the vaccination wounds and the abscess above them healed well and entirely six weeks at least before the abscess in the right lachrymal sac appeared, it is improbable that vaccination had anything to do with the child's subsequent illness.

It should be noted:—

(*a.*) That the glands affected were not the glands in anatomical relation to the vaccination wounds or the abscess which formed above them.

(*b.*) That both the vaccination pocks and the abscess on the arm healed well, and have remained firmly healed.

(*c.*) That there is a tubercular tendency in the mother's family.

(*d.*) That the other child is obviously delicate, and with a tendency to glandular enlargement although it has not been vaccinated.

In view of the above facts it may well be doubted whether the abscess on the left arm was the starting point of the glandular suppuration from which the child has since suffered; the evidence being strongly in favour of the belief that the case is one of chronic strumous disease of glands, and that vaccination bears no causal relation to the child's present condition.

THEODORE DYKE ACLAND, M.D.

CASE 132, REPORTED TO THE COMMISSION BY THE CORONER.

Case of A. S.: report to the Commission of Dr. Theodore Dyke Acland.

Vaccination. A. S., of ——, was vaccinated when three months old, of Dr. L., on the 30th July 1891.

Death. 11th April 1892.

Verdict of coroner's jury. "Broncho-pneumonia and asthenia, resulting from "chronic diarrhœa."

Source of lymph. Directly from the arm of one of two children, E. or A., it is uncertain which. According to the register it came from E., but Dr. L., the vaccinator, informs me that he believes that on the 30th July he was forced to do one or two vaccinations from A. I did not investigate this subject further as it did not seem likely to throw any light upon the case.

Course of vaccination. According to Mrs. S., the mother of the child A. S., the arm became much inflamed after vaccination, although on the eighth day Dr. L. has no note that the condition was abnormal. Subsequently the inflammation extended from shoulder to elbow, and the wounds remained open for five or six weeks, and then completely healed. Sores are said to have formed on the thumb, elbow, and forehead. They were covered with thick yellow crusts, and were not healed till October.

Course of illness. The child was taken once only to the Shadwell Hospital in November 1891, but was not definitely under medical treatment until the 25th November, nearly four months after vaccination, when he was taken to see Dr. R. D., of ——, under whose care he remained until he died. He tells me that he was informed that the child had been well until he was vaccinated, but had been ailing since; that he had emaciated very much, and passed green or grey slimy motions. He found that he was being improperly fed; he made a complete alteration of diet, and also prescribed for the child. The character of the stools improved, but by the end of December he began to suffer from diarrhœa, and the emaciation increased. About this time, also, it was noticed that the chest was affected, and that the air was entering the lungs badly. At the end of February or early in March 1892 the skin became white and shiny, and the face was so swelled that the child could hardly open its eyes. The swelling was brawny, and involved both hands and feet. Dr. R. D. then told the parents that he did not believe that drugs were likely to benefit the child much, and advised them to spend their money in providing it with proper food rather than in paying a doctor. During February and March he saw the child four times; on the 1st April the pulse could hardly be felt, and the breathing was very shallow. He did not see it again before it died. He was unable to find any evidence of syphilis in either the mother or the child, and he considered the case to be one of marasmus from malnutrition consequent on artificial feeding. He did not think there was anything exceptional in the case.

Treatment of vesicle. I have been unable to obtain any record that treatment was considered necessary for the vaccination vesicles. By the time the child came under Dr. R. D.'s care the arm had entirely healed.

General history. About a month before vaccination the mother found that she was unable to give the child sufficient nourishment at the breast, and in addition to suckling it, she therefore fed it upon nursery biscuits. In August, very shortly after the child's vaccination, the mother again became pregnant, and notwithstanding this she continued to nurse the child for a month or six weeks. The child at this time had no diarrhœa or sickness. About two months after vaccination the mother says that she noticed "the milk was too thick," by which, as far as I could elicit from her, she meant that the child vomited it up directly it had taken it; at the same time it commenced to have persistent diarrhœa. The mother cannot exactly tell me when her milk "became "thick," but she is sure that it was *insufficient* a month before vaccination. It was not until the beginning of November that the child was first seen by Dr. R. D., and the mother given definite instructions as to the proper method of feeding it. Even at that time Dr. R. D. seems to have anticipated a fatal result.

Post-mortem. A post-mortem examination was made by Dr. R. D. on Thursday, the 14th April, at which I was present, and made the following notes:—

Body; emaciated, rigor mortis absent, œdema of the extremities very marked, especially of the lower legs, the feet, and the right (the vaccinated) arm. There were three small but healthy-looking vaccination cicatrices on the left upper arm, without any sign of there having been inflammation or suppuration round them; there was no evidence of there having been any enlargement or suppuration of the axillary glands. The body was free from eruption of any kind.

Abdomen; intestines empty, a small amount of ascitic fluid between the coils, the mesentery was studded with large lymphatic glands, and at its dorsal attachment the glands were aggregated into considerable masses; the bowel itself contained little but mucus, at the lower part of the small intestine there was a small amount of liquid fæces. The colon was full of opaque mucus, which covered the whole membrane with a thick viscid coat. The stomach contained no particle of food or milk. It was almost filled with a quantity of viscid hardly turbid mucus.

Kidneys lobulated, capsule not adherent. The texture of both organs was extremely tough, so that it was with difficulty broken down with the finger. On microscopical examination there was evidence of some excess of cellular elements in the Malphigian tufts, the capsules being thickened and thrown into creases. The cells of the tubules were opaque and yellowish (? post-mortem change).

Liver not enlarged, consistence natural, to the naked eye nothing abnormal.

Spleen lobulated, rather large, soft and friable. Two small white masses on capsule and anterior edge, looking like tubercles.

Thorax, pericardium contained a considerable quantity of fluid. Cavities of the heart empty, no malformation of the valves; the muscular tissues seemed normal.

Lungs, the upper lobes on both sides were collapsed over a considerable area, and on section were found to be airless. The lower lobe on the left side was engorged, but there was no sign of lobular pneumonia. On section over both lungs the bronchial tubes stood out prominently and seemed thickened; over both lungs there were small glistening grey masses like

tubercles, in some parts quite thickly set. On microscopical examination it was found that the lungs were extensively affected with broncho-pneumonia, the inflammation round the bronchi being very marked. The small white patches noted on section of the lung were minute areas of inflammation round the bronchi and not tubercles. The microscopical examination of six sections in various parts of the lung gave no evidence that the disease was tubercular.

Brain; a considerable quantity of serous exudation under the membranes, brain substance itself soft and easily lacerated. No evidence of tubercle in the vessels of pia mater.

No other evidence of disease was detected.

There is ample evidence to show that the child died from a disease which would be greatly aggravated by improper feeding, resulting in chronic catarrh of the digestive tract, and terminating in a low form of broncho-pneumonia. The post-mortem examination showed gastro-enteric catarrh of great severity and long duration, the condition of the gastric and intestinal mucous membrane being such as practically to make proper nutrition impossible. In addition to the diseased state of the digestive tract, there was also correlated enlargement of the mesenteric glands, and widely disseminated disease of both lungs. The œdema of the limbs was probably an expression of the condition of the blood, which was shown also by the presence of ascites and by hydro-pericardium and serous effusion on to the surface of the brain. I was unable to satisfy myself that the condition of the kidneys threw any light on the nature of the disease from which the child died.

If the mother's statement is correct, it would appear that vaccination did not pursue a normal course, that there was an undue amount of inflammation, and that the healing of the vesicles was in consequence delayed. It is probable that a more than ordinary amount of constitutional disturbance may have been set up by vaccination in a child suffering from, and enfeebled by, the ill-effects of insufficient and improper feeding, but the evidence is clear that the child died from causes which are common in children when entirely unconnected with vaccination, and from the history of the case it may reasonably be doubted whether vaccination directly contributed to the child's death.

I append a copy of the depositions taken at the inquest.

THEODORE DYKE ACLAND, M.D.

(Copy of depositions taken at Inquest.)

The Information of Witnesses severally taken and acknowledged on behalf of our Sovereign Lady the Queen, touching the death of A. S., at ——, on the Thirteenth day of April, in the year of our Lord One Thousand Eight Hundred and Ninety-two, before me, W. E. B., Esquire, one of Her Majesty's Coroners for ——, on an Inquisition then and there taken on view of the body of the said A. S. then and there lying dead.

R. D., having been sworn upon the day and year and at the place above mentioned, deposed as follows:—

I reside at ——. I am M.R.C.S. and registered. The deceased was brought to me last night. The child was suffering from tabes mesenterica. The mother was pregnant and was unable to nurse it, consequently the child was unable to assimilate any other food. I believe she was most attentive in her care of it. Both she and its father expressed themselves very anxious for its recovery. I told them it was not a case for medicine but careful nursing. I did not look at the arm, but I examined it when first I saw the child on Monday. The mother has ascribed the death to vaccination. I examined it with that object; there was nothing to suggest it in any way. In my opinion the vaccination was in no way suggestive of the cause of death. The scar was then cured, it had disappeared. No eruption, nor had there been. The mother was compelled to wean it in consequence of her pregnancy. I last saw it alive on the 1st of April. I did not see it after death before I gave a certificate. I gave the certificate that the child died from tuberculosis. I don't think from the evidence that the child was suffering from pneumonia. I always expect a certain amount of difficulty in breathing in such cases. I have seen the body in the mortuary. There are no marks of violence. The body is wasted to a shadow. There is no evidence in the features suggestive of broncho-pneumonia.

R. D. upon his Oath saith:

I reside at ——. I am M.R.C.S. and registered. I have made a post-mortem examination of deceased. I made it at the —— mortuary on the 14th April at 5 p.m. There were no marks of violence. A little discolouration on the stomach, otherwise very pale. It was œdematous, and very badly nourished. I should think it was below the average weight. There are no scales.

Brain. Very easily broken—no disease.
Lungs. Filled with grey deposit. Very shrunken—very little air in them.
Heart. Healthy; quite empty both sides.
Liver. Fairly healthy.
Spleen. Large; very tough.
Kidneys. Extensively diseased, debilitated, and very tough.
Stomach. Very wasted and useless.
Intestines. Filled with mucus and quite unfit for their duties, and had been for a long time.
Mesenteric glands. Disordered.

In my opinion the cause of death was asthenia. The arm had three well-marked pocks close together, but had not ulcerated. In my opinion there is no connexion between vaccination and the cause of death. The child was suffering from tabes mesenterica. The child had evidently been unable to assimilate food for some months past. There was no evidence of its suffering from syphilis.

Theodore Dyke Acland upon his Oath saith:

I live at 74, Brook Street. I am M.D., F.R.C.P., and registered. I was requested by the Vaccination Commission to attend the post-mortem, which I did. I generally agree with the results of the post-mortem as described by Dr. R. D. The lungs and bowels were extensively diseased. The cause of death, I should think, was chronic diarrhœa, as shown by the state of the bowels, which must have been almost useless for the assimilation of food, and the condition of the lungs—broncho-pneumonia indistinguishable from tubercle to the naked eye. I have made a careful examination microscopically of the lungs, kidneys, and mesenteric glands. There was nothing at the post-mortem to show any connexion between the vaccination of the child and the cause of death. The broncho-pneumonia had been going on for weeks and probably months.

E. E. S. upon her Oath saith:

I live at——. I am the wife of J. S., a dock labourer. The deceased was my son. His name was A. S. His age was 11 months. He has been wasting for the last eight months after being vaccinated. He was quite well until he was vaccinated. He was attended on and off by Dr. R. D., and last seen by him on Friday, April 1st. I have had medicine and powders for him since. On Monday, April 11, about 9 a.m., whilst I was nursing him, he began to gasp for breath and died about 11 a.m. This is my first child. He has met with no injury as I know of. His life is insured and I get 2*l.* 10*s.* by his death. It made a little noise in its breathing since Friday. I have kept it warm. I had it out a little on Thursday when the sun was out, but I wrapped it up warm. Dr. L. vaccinated the child. It was some weeks before it healed up. About a fortnight after he was vaccinated a rash came out over its face and arms. I took it to Dr. R. He said there were a lot of people came out like that after vaccination. I then went to the Children's Hospital. They gave me some medicine, but the child would not take it. I told them that the baby came out like this after vaccination, but they did not say anything. The rash had gone when I took it to Dr. R. D. It was three months old when it was vaccinated. I believe the vaccination was the cause of death.

M. H. C. upon her Oath saith:

I live at the same house. I am the wife of J. C., a dock labourer. The deceased is no relation of mine. I was called to see the deceased on Monday, April 11th, about 9 a.m. He was then in the mother's arms and gasping for breath and died about 11 a.m. No doctor was sent for.

I saw it both Sunday and Monday morning. I noticed it made a little noise in breathing. I had not noticed it till that morning. I did not think it would live for some months. The mother lives on the basement floor back room. The back room is generally kept shut. One door leads into my wash-house. I don't think the rooms are damp. I live in the basement and I never found it damp.

CASE 133, REPORTED TO THE COMMISSION BY THE CORONER.

Case of A. F. S. : report to the Commission of Dr. Theodore Dyke Acland.

Vaccination. A. F. S., of ——, was vaccinated by Mr. C. L., Public Vaccinator, when three months old, on the 23rd December 1891.

Death. 17th April 1892.

Inquest. Tuesday, 26th April, and Thursday, 5th May 1892.

Verdict of Coroner's jury. "Inflammation of the lungs," with a rider attached. (See copy of the depositions and verdict appended to this report.)

Source of lymph. According to Mr. C. L.'s register directly from the arm of J. C. of ——.

Vaccinifer. A well-nourished child, said by its parents to have been well at the time the lymph was taken from its arm. The evidence, however, as to the condition of the vesicles on the 23rd December is conflicting. Mrs. C., the child's mother, states that there was inflammation as far as the elbow at that date. This is denied by Mr. C. L., who says that he never takes lymph from vesicles around which there is a marked areola; and Mrs. C., the mother, informed me *before* the inquest was held that the arm progressed favourably until the scabs were knocked off, as they had been on two or three occasions, and that, notwithstanding that the healing of the vesicles was thus delayed, there had been no excessive inflammation nor any suppuration round the vesicles or in the axillary glands. At the date of my inspection of the arm on the 26th April 1892 there were four irregular cicatrices. The child seemed well; there was no enlargement of the axillary glands, no eruption, and no evidence that the child's health had suffered from vaccination.

Co-vaccinees. None.

Sub-vaccinees. According to the register, one; S. U., of ——. In this case also the evidence is conflicting. The child H. C. who took A. F. S., the subject of this report, to be vaccinated, and who also took him to the surgery a week later to be inspected, says that she is certain that no child was vaccinated directly from A. F. S.'s arm, and that no tubes or points were charged from the vesicles. Mrs. U., the mother of S. U., states that she is sure that her child was vaccinated with lymph from a glass tube, and Mr. C. L. informs me that he often takes lymph in a tube and vaccinates with it the same day. No sufficient evidence for doubting the accuracy of the register has been adduced. During the week after vaccination the child had a bad cough, and it had since suffered from bronchitis. There had been slight inflammation round the pocks, but these healed entirely in three weeks. There had been no rash and no inflammation of the axillary glands. When I inspected the child's arm there were three normal cicatrices. The cervical glands on the left side were just perceptible, but there were none to be felt in the axilla.

Course of vaccination. Up to about the tenth day A. F. S.'s vaccination was normal. After that time there was considerable inflammation round the vesicles with suppuration, and the discharge from the wounds is said to have been very offensive. The vesicles did not heal until a month before the child died, and the evidence of the parents and those who had charge of the child goes to show that it suffered severely in consequence of ulceration, which took place at the points of inoculation. No definite abscesses seem to have formed, although the mother states that there was some discharge from the axilla and from behind the ear on the same side. I was, however, unable to elicit that this was due to anything more than superficial excoriation.

Course of illness. There is good evidence to show that the child was weakly and feeble from its birth. When it was a month old it had a severe illness evidently due to its being weaned, for up to that period it had been suckled by its mother; but being an unmarried woman she was then turned out of her home, and having to go to work, she weaned her child. At first, as it seems, she left it the greater part of the day without food, and fed it only when she came back in the evening. From birth the child was unable to suck properly owing to some defect of the palate, and after it was weaned it had to be fed entirely with a spoon as it could not suck the bottle. It is alleged by those who had charge of the child that it was unable to digest milk, and that when milk was given to it, it vomited frequently and passed offensive motions. It was in consequence fed on bread and water with occasional doses of brandy. Under this treatment the child is said to have thriven. Considerable doubt, however, may be thrown on this statement by the fact that the child's life was insured in November, a month previous to vaccination, by a person entirely unconnected with it, for the purpose, as she alleged, of helping the parents with the burial expenses in case it died. No mention of the child's previous illness was made to Mr. C. L. at the time it was taken for vaccination, and although he states that when it was brought to him it was a healthy child, I believe, from the way in which he gave his evidence, that he had very little, if any, recollection about it. Shortly after the vaccination, and while the arm was still severely inflamed, the mother left her situation in order to take charge of her child. The conditions under which it lived were hardly improved by this, for the mother had no fixed home and apparently had to depend upon the kindness of neighbours, so that the child was sometimes in the care of one person and sometimes in the care of another. From this time up to the time of the child's death it was constantly under medical supervision, and both Mr. and Mrs. C. L. inform me that it was ill kept. On one occasion it was brought to the surgery with an old and stinking poultice upon its arm, and on another the mother had put the child into short clothes, and the sleeve of the new stuff frock and the linen shirt, which were stiff with dressing, were irritating the vaccination wounds. Mr. C. L.'s statements as to the filthy condition of the child were denied at the inquest by the parents, and by Mrs. C., who had had the child out at nurse; but there can be no question that the child was ill-fed, badly looked after, with no fixed home, and that under those adverse conditions it had to be taken daily to the surgery during the two coldest months in the year. It never rallied, and gradually sank from exhaustion after nearly three months' illness. A month before death the suppuration of the vaccine vesicles had ceased, the wounds had cicatrised, and the arm was practically well. It is not certain when the illness which proved fatal actually commenced. Dr. C., who made the post-mortem examination, is of opinion that probably the inflammation of the lung which he found had existed for six weeks, but of this there is no evidence, since, so far as I can learn, the condition was not recognised during life.

Post-mortem appearances. After death Dr. C. found pneumonic consolidation of the whole of the lower lobe of the right lung. He states that on section pus exuded from several points, but that there was no sign of any localised abscess or of tubercular deposit. He says there was an entire absence of omentum, and that the digestive tract was completely empty, except for a small quantity of undigested bread. The child was wasted to a skeleton. There was no vestige of fat throughout the body, its weight being 6 lbs. 6½ oz. when seven months old. There were four vaccinated marks on the left arm; the upper outer one was puckered, indicating that there had been suppuration at the point of puncture.

Treatment of vesicles. The inflammation of the arm was at first treated by Mrs. C. without medical advice; the vesicles were poulticed, and wet Fuller's Earth was applied. The vesicles were further irritated by the sleeve of the frock, as above stated. After the mother had obtained medical advice a treatment of cold water applied with rags was adopted, and latterly some lotion was prescribed by Mr. C. L.

Previous history. The child was illegitimate. It was never able to suck properly. When five weeks old it was put out to nurse. An insurance was effected on its life, and the conditions under which it lived were such as to make it almost impossible that it should thrive.

Method of vaccination. At the inquest some discussion was raised as to whether Mr. C. L. had strictly complied with the instructions issued by the Local Government Board to Public Vaccinators. I have pointed out in a previous report, on Case 115 [Series] at page , that he does not make a habit of thoroughly examining either the vaccinifers or vaccinees, but, so far as I have been able to observe, I cannot satisfy myself that the actual process of vaccination is performed

otherwise than carefully. Some discussion was also raised as to whether the regulations were complied with in Dr. C. L.'s not keeping the register himself. The register is kept by Mrs. C. L., his wife, who enters the names of the children before their vaccination.

The way in which the child was brought up and fed, and the conditions under which its mother was obliged to live, make it extremely probable that the vaccination did not pursue a normal course, owing to the enfeebled health of the child rather than to any actual defect in the method of the vaccination or in the lymph used. The injury to the scabs by the sleeve, and the irritation of the wounds by the application of poultices and wet Fuller's Earth, cannot fail to have aggravated the inflammation; and this was further increased by the child's feeble condition and miserable surroundings. All these circumstances doubtless combined to depress its vitality, already low, and render it liable to some asthenic form of pneumonia such as was ultimately the cause of death.

I append a copy of the depositions taken at the inquest and of the verdict returned by the jury.

THEODORE DYKE ACLAND, M.D.

(Copy of depositions taken at Inquest and of verdict returned by Jury.)

Information and Examinations of Witnesses taken upon Oath the Nineteenth day of April in the year of our Lord One Thousand Eight Hundred and Ninety-two at —— before me, E. D., one of Her Majesty's Coroners for ——, on an Inquisition taken on the view of the body of A. F. S., then and there lying dead, aged six months.

Date of death, Sunday, the 17th day of April 1892.

Place of death, ——.

E. S., being duly sworn, says:—

I live at——. I am in lodgings with a Mrs. C., and am a single woman. The deceased A. F. S. was my son. He was six months old, having been born on the 25th September 1891. Deceased had good health up to the time he was a month old. He then became unwell and appeared to suffer from pains in his stomach, but I cannot say the actual cause of his illness. I took the deceased to Dr. C. L., and he gave me some medicine. Deceased appeared to get quite well in about a fortnight from the time he became unwell, and continued in good health until he was vaccinated about three weeks before Christmas last. Soon after he appeared to sink and became weak and delicate in health, and got gradually worse, until death happened on Sunday last. I consider that the illness of the deceased resulted from the vaccination, and that the vaccination caused the death of the child.

Adjourned to Tuesday, the 26th April 1892, at 2.30 for a report to the Secretary of the Vaccination Commission.

Mr. C. G., instructed by Mr. A. T. C., appeared to represent the mother of deceased.

Dr. Acland, of London, attended on behalf of the Royal Commission on Vaccination.

E. S. recalled—

The deceased was a strong and healthy child at the time of its birth. I have seen the only child that had been vaccinated. I saw that child in Dr. C. L.'s surgery. This was some time after my child was vaccinated. I do not know how long. This child's arm was much inflamed. H. C., the daughter of the lady I lodge with, took my child to Dr. C. L.'s surgery to be vaccinated. I do not know the date, except that it was three weeks before Christmas 1891. The child was, I am told, vaccinated on a Wednesday. I saw it the following Sunday, being away at Mrs. L——n's —— Coffee House. I noticed four marks on the child's arm. They were on the right arm. The marks appeared to be nicely. I did not see the child again until the following Sunday. I noticed the marks again, they were then very much inflamed. I mean by this that there was red round the marks, and the marks were very hot. The arm was not affected in any other way. The four marks were swelled up. I mean by this that the marks were drawn up together, and there appeared to be matter underneath the scab which had formed over each of the marks. I was with the child on this occasion about two hours, and I minded it some of the time: it was in the evening after tea. I saw the child next on the following Tuesday evening between seven and eight o'clock. I noticed the appearance of the child's arm again, and the marks. The matter underneath the marks then appeared to be working like balm, and the matter was running out of all four marks on to the child's arm. The stench was cruel. The two top marks had worked into one, and holes had formed into all the marks so that you could push your finger down on to the bone. I asked Mrs. C. to take the child for me to Dr. C. L.'s the next day. The condition of the arm appeared to affect the child's health, and to make him pine and cry. I saw the child again on the Sunday following the Tuesday I am speaking of at about between one and two o'clock. The arm was then in much the same condition as on the previous Tuesday, and the matter was still running from all the marks. The redness had then disappeared from the arm. The holes were still there. The next day, Monday, I came home about seven o'clock. The marks and the arm were much in the same condition, except that the holes appeared to get deeper. I remained at home that night, and the child slept with me. The child was very restless during the night and did not sleep much, and cried during the greater part of the night. I had some medicine which Mrs. C. had obtained from Dr. C. L., and I gave the child a teaspoonful just before going to bed about ten o'clock. The following morning, being the Tuesday after Christmas Day, I took the child myself to Dr. C. L.'s surgery. So far as I know up to this date the doctor had not prescribed any treatment for the child's arm. I saw Dr. C. L. between nine and ten o'clock at the surgery. I showed the doctor the child's arm. I asked the doctor the best thing I could do for the baby's arm. I asked this because the arm was so bad. I pointed out the arm to the doctor; the matter had then ceased running from the arm, but the marks had not dried up and were still a mass of matter, and the holes were still in the marks. The doctor told me to apply cold spring water and rags to the marks, and also told me to bring the child every day to the surgery between two and three o'clock. I told the doctor that the child did not seem well with his arm, and would not eat and could not sleep. I showed the doctor the medicine I was giving the child, and the doctor told me to continue giving the medicine according to directions. I went home with the child and applied the cold-water remedies as directed. I continued to nurse the child myself for about two months, and took the child every day to Dr. C. L.'s surgery during this time. In about a fortnight after I commenced to apply the water treatment to the marks, the marks appeared to get slowly better. I mean by this that the running matter which had still continued in a much less degree gradually ceased. I continued, however, to apply the cold-water rags until about five weeks before the child died, when the matter ceased running altogether. About this time I noticed a blue mark round the circle of each mark just where the running matter had ceased, and Dr. C. L. then gave me a lotion which he directed me to apply by using rags in the same manner as the cold water. I continued to apply the lotion several times a day, and the blue mark disappeared in about a week's time. The marks dried up, and the arm then appeared to be well, but the marks of vaccination remained where the child's arm had been drawn up, but the child still remained in a weak condition of health. I continued to take the child to Dr. C. L. at least once a week. He gave me medicine which I gave to the child, but the child's health did not improve, but got gradually weaker. I took the child to Dr. C. L.'s surgery on the Tuesday before he died in the evening, and I saw Mr. S., Dr. C. L.'s assistant. He looked at the child and said he would gradually pine himself away. I still continued the medicine. About a quarter to five on the following Saturday afternoon the child suddenly had a fit. He was lying on

the sofa. I called out to Mrs. C. She took the child and sent me off for the doctor, but Dr. C. L. and his assistant were out. I failed to obtain a doctor. The child continued in the fit for about three-quarters of an hour. Mr. S. came about 10.30 the same night and saw the child. He said it was a poor weak little thing, and if it survived until the following morning I was to send for some medicine. The child lay in the same position on the sofa, and died at a quarter to five on the Sunday morning. It died calmly and quietly. The child was still suffering from the effects of the fit when seen by Mr. S. I had given the child the breast until it was a month old. The doctor then ordered me to give the child some corn flour in its milk, but it would not suck the milk. I left home when the child was about five weeks old, and it was then taken charge of by Mrs. C. It was then fed upon bread boiled in water, but it did not have any other kind of food. The child was fed with bread in a teaspoon. I tried to feed the child with milk, but it would not stay on the child's stomach.

By Dr. Acland:

I weaned the child when five weeks old, and from that time up to the Tuesday after Christmas it was taken charge of by Mrs. C. At the periodical visits I made to see the child after the first five weeks of its birth up to the Tuesday after Christmas I know that the child was fed upon boiled bread. Whilst I was at service I bought some brandy which, by the doctor's direction, was given in its food. The child thrived on the bread and water up to the time it was vaccinated. The child was taken to Dr. C. L. for inspection a week after vaccination. I did not notice any rash on the arm. I applied the cold-water treatment every half-hour day and night. I noticed a hardness under the child's armpit, and an abscess and matter. I showed it to Dr. C. L., and he gave me some ointment. There was also a discharge from the right arm.

By Mr. C. G.:

I saw the child at Dr. C. L.'s with a bad arm on one occasion. Mrs. C. L. saw the child on several occasions in the presence of Dr. C. L. Mrs. C. L. was always in the surgery. Mrs. C. L. mixed me some bottles of medicine Mrs. C. L. said nothing about the arm. Mrs. C. L. said nothing about vaccination having anything to do with the child's arm. Mr. T. and Mr. W. and two other gentlemen came and saw the child when its arm was at its worst. They came several times about three weeks after the child was vaccinated. The child appeared to thrive and get fat, except the illness I have mentioned up to the date of vaccination.

By the Coroner:

The child was in good health up to a month after its birth. It then had an illness which lasted for about a fortnight. It was then in good health up to 23rd December 1891 (the time it was vaccinated). I had charge of the child from the Tuesday after Christmas Day. I tried it with corn flour and milk in a bottle, and I also fed it with a spoon with milk. I tried this for about three weeks, but the child vomited immediately I gave the milk or the corn flour. It vomited every day for three weeks. I then adopted the original food that of bread and water, which the child had had whilst nursed by Mrs. C. This food was given to the child, as I was told, by Mrs. C. by the direction of the doctor, but I cannot say the name of the doctor. Mrs. C. was paid 3*s.* a week for taking charge of the child. Mrs. C. suggested that the child should have a little brandy with the bread and water. I cannot tell the date when the brandy was first given to the child. I insured the child's life in the British Workmen's Insurance Company, but I allowed the insurance to lapse.

A. C. being duly sworn says:

I live at ——. I am a widow. The mother of deceased came to my house on the Saturday before the child died. I took her in out of kindness because she had no home.

E. S. recalled on 6th May 1892:—

I nursed the deceased until it was a month old. The deceased would not take the breast freely on account of his mouth being high roofed. When the deceased was five weeks old I put him to nurse with Mrs. C., who lived at ——, and arranged to pay her 3*s.* per week. The deceased continued with Mrs. C. until about three weeks after he was vaccinated at the address I have given. After this time I had sole charge of the deceased. I removed it from the care of Mrs. C. and went to lodge with the deceased at Mrs. S.'s at ——, and I stayed there until the Saturday before the deceased's death. I changed the lodgings of the deceased because they had not room for me. The deceased's arm was at its worst about three weeks after it was vaccinated. Except the fortnight's illness immediately after its birth the deceased had good health until it was vaccinated. I insured the deceased in the British Workman Insurance Company but allowed it to lapse. I paid about six or eight weeks. The deceased was also insured by a Mrs. B., a neighbour who lives in ——. I do not know what reason Mrs. B. had for insuring the deceased. I am not aware that the deceased was insured by anyone else. Mrs. B. is entitled to receive 30*s.* from the insurance—I think from the London and Manchester Office—when I sign my consent for her to do so. With the exception of about three weeks after the time I took charge of the child I fed it upon bread and water. I put a teaspoonful of brandy in a teacupful of food three times a day. The bread was boiled in water. Sometimes I put a little butter in, and there was always sugar put. I continued this food until a week before the deceased died, when, by the direction of Dr. C. L.'s assistant, I gave the deceased milk. I gave the deceased milk at least half a dozen times a day during the week previous to its death. It was warm milk and I fed it with a teaspoon. The deceased took half a teacupful at each time it was fed, making in the whole about three teacupsful three times a day. The deceased took the milk by my feeding it with a spoon. It was an ordinary sized tea cup.

By Dr. Acland:

The deceased was never able properly to suck. I gave the deceased milk during the last week of his life because I was ordered to do so by Dr. S.

By the Coroner:

I left Mrs. S. on the Saturday morning and went to Mrs. C.'s, where the deceased died on the Sunday morning.

A. C. being duly sworn says:—

I live at ——, and am a widow. I have known the deceased by seeing him in the street when he was about three weeks old. The deceased was then living at the mother's father's at ——. The name of the father is W. S. When the deceased was about three weeks old the mother and the deceased left its father's house and then went to a Mrs. B.'s for a time. When the deceased was five weeks old the mother brought it to me. She was crying and said she had something to do but no one to nurse the baby, and asked me if I would have it for a day until she could get someone to mind it. I did not wish to mind the deceased as I had enough to do to mind my own, and I have to work and get my own living. The deceased remained with me that week, and was very ill at the time. The deceased remained with me until three weeks after being vaccinated, namely, about three weeks after Christmas. The deceased was very ill when brought to me. He was attended by Mr. S., and visited at my house. The deceased was attended by Mr. S., and appeared to be suffering from bronchitis. I dressed it with oil, and put flannel shirts, and used it the same as I should one of my own. The illness lasted about a fortnight. Deceased got better, and was going on very nicely until it was vaccinated. The deceased was naturally a weakly and delicate child. Deceased had something the matter with his mouth, and never could suck from the bottle. I sent the deceased with my little daughter H. C. to be vaccinated; her age is 14. I sent her in accompanied with my daughter, M. C., my son's wife, because I thought that my daughter's was a nice healthy child, and that deceased might be vaccinated from it. This was a few days before Christmas day. The deceased was brought back the same afternoon vaccinated. I have seen children vaccinated. I have had six of my own vaccinated. I saw nothing to object to in the vaccination when the deceased was brought home. I noticed the vaccination marks did not fill up by the Wednesday following as they should have done when the child should go to be inspected. I sent my daughter with the deceased to Dr. C. L.'s to have the arm inspected in the usual way. I observed when the deceased was brought back that no matter had been taken from his arm. In a fortnight after the deceased was vaccinated the vaccination marks gathered up, and the arm swelled, and corruption came from it, and smelt very badly. There was also a redness round each mark. The arm got very bad, two of the marks seemed to almost form together. The father of the deceased, C. P., came in and out of my house to see the deceased, and he used to nurse it frequently. He told me when he saw how bad the arm was that he should have the mother at home

to nurse the deceased. I told him I wished he would, as I did not wish to do so. The deceased was taken from my house by the mother to Mrs. S.'s in about three weeks from the date of the vaccination. I think the deceased was then a little better. I washed the deceased's arm well with warm water about a fortnight after its being vaccinated with the idea of washing out the vaccination. I washed it two or three times a day, every day for about a week. I also put some Fuller's Earth on the arm after I had washed it. I did this for a day or two. I did all this with the view of relieving the inflammation. This treatment appeared to have improved the deceased's arm. The inflammation was less than it had been when it left my house. I was paid 3s. a week for the deceased. I had the deceased to nurse occasionally for a day or so after the arm was well. I saw the arm about a month before the deceased died, and it appeared to me to be well so far as the vaccination was concerned, and the marks had healed up, except that there were signs of vaccination. The child never seemed to me to be well after it left my house. When I saw the deceased three weeks before death he appeared to be getting lower. The Saturday before the deceased died the mother returned with the deceased to my house, and said she had nowhere to go, and asked me to take her in with the deceased. The deceased was then very bad. She came to my house about nine o'clock in the morning. About five o'clock the same afternoon the deceased was taken with a fit. Dr. C. L.'s assistant was sent for, but he was not in, but he came about ten o'clock the same night. He saw the deceased. The mother brought a bottle of medicine with her. It was given to the deceased that day. The medicine was had from Dr. C. L.'s. Dr. S., when he saw the child in the evening, said it was very bad, and there was not any hopes for it. He did not give him any more medicine. Deceased was then so ill that he was unable to take food, and got gradually worse until he died. I was up with him until two o'clock, when I left him downstairs with his father and mother. Deceased was lying on the sofa. I had no bedroom for the mother or deceased. The mother lay on the sofa with the deceased. I tried the deceased when it first came to me with milk and finger biscuits. I then fed it with bread boiled, and sometimes with a little butter, and always a spoonful of brandy; this was before the vaccination. I continued the same food until it left me. I should think the results of vaccination are greater in some children than others. I think more or less there is an amount of pain or irritation resulting from vaccination. The deceased was taken to Mrs. S.'s after being taken from my house, where he continued to live the whole of the time until it died, except the times when it was occasionally brought to me. The mother had a bedroom there, and used to sleep with her little boy.

By Dr. Acland:

The deceased was liable to vomit if I gave it anything. The deceased was not purged. Deceased used to smell very bad. The deceased could not suck. Dr. C. L. had been doctoring the deceased before it was sent for vaccination. I made no communication to Dr. C. L. at the time the deceased was vaccinated with regard to the deceased's health. The deceased was nursed by one and then by another, in fact it was nursed by anyone out of charity. The father did not make any complaint to me that I had not done my duty by deceased. He said he would have the mother at home to see to the deceased. I did not know the deceased was insured.

By Mr. C. G.:

When the child went to be vaccinated it had come on well. I thought it was then fit to be vaccinated. No one had come ordering me to have the deceased vaccinated. There ought to have been a white blister on the arm when the deceased should have been taken to be inspected, but there was no blister. No lymph had been taken from the deceased after the inspection. If lymph had been taken from the arm the blisters would have been pricked underneath. I am quite sure the deceased's arm had not had lymph taken from it. I know from my own children how the arm would look if the lymph had been taken away.

By the Foreman:

After the deceased was vaccinated he was put into short clothes, and a red twill dress lined with calico was put on him. I thought it would be better not to have put this new dress on until the arm was well.

By Mr. C. G.:

The new dress was put on, I think, about a week before Christmas. The arm was getting worse at the time the new dress was put on. There was a bit of rag round the arm and the sleeve tied it up. I should have left on the long dress which the deceased had been previously wearing if it had been my child.

By Dr. Acland:

Up to the time when the new frock was put on the arm was covered up. The scab had not then come up, but there was no sore on the arm.

By the Coroner:

After the frock was put on the scab burst. I went down to Dr. C. L.'s myself and told him of the putting on of the new frock, as I did not know whether that would make any difference or not, and Dr. C. L. replied that he thought it would. I should not have done it myself. I am not sure whether the putting on of the new frock happened about a week or a fortnight after the vaccination.

H. C. being duly sworn says:

I am 14 years of age next birthday. I live at ——. I knew the deceased who lived with my mother for some time. I took deceased to Dr. C. L.'s surgery. My brother's wife, Mrs. M. C., went with me. I took it to the surgery for the purpose of being vaccinated. I held the child while it was being vaccinated at Dr. C. L.'s surgery. The following week I took the deceased again to Dr. L. C.'s surgery, and showed the doctor the deceased's arm. Nothing was then done at it. I did not take it to the doctor again on any other occasion.

By Dr Acland:

Mr. C. L. saw the arm when I took it the second time. He only looked at it. He said the arm was all right.

By Mr. C. G.:

When I went to the surgery to have the deceased vaccinated I went with my brother's wife, M. C. Mrs. C. L. and Mr. C. L. were there. I cannot say how many people were there altogether. There were other women besides us. When we got inside I went and sat down with my sister-in-law. Dr. C. L. called me up with the child to be vaccinated. There were some things on the child's arm, and Dr. C. L. pushed them up. He did not say anything besides telling me to sit down. He took the matter from my sister-in-law's child's arm. I did not go away until the arm was dried. Mrs. C. L. told me to sit down. Dr. C. L. did not say anything else to me, but he asked me the child's name. He asked me if the child was named after the father or the mother, and I told him it was named A. F. S., and he asked me if that was the father's name, and I told him the father's name was P. He asked me where the father lived, and I told him in ——. He asked all these particulars before he vaccinated the child. The doctor wrote what I said in a book. Mrs. C. L., I think, was filling the matter. They had a little spot of water. Mrs. C. L. was filling the eyes of those things like needles. She was in the other place by herself. After the child had been vaccinated I was told to sit down until the deceased's arm was dried and then take it away. Dr. C. L. did nothing else to the child except to push the child's clothes up and vaccinating it. I took the deceased a week afterwards to the surgery again. Mr. and Mrs. C. L. were both there. I went into the surgery and Mrs. C. L. asked me if I had come to have the matter took from it, and I told her I had. She said nothing else. I showed deceased's arm to Mr. C. L. and he told me to go. He did not say anything about how the arm looked. He just looked at and told me to go home. No one went with me this time. From the time I left the house at —— to go to the surgery I gave the deceased to no one. I am quite sure Dr. C. L. did nothing to the deceased's arm.

By Dr. Acland:

I was not asked whether the deceased was quite well when I went with him. The deceased was vaccinated before other children who were waiting to be vaccinated. I went with Mrs. C., my sister-in-law's child, so that deceased might be vaccinated from him.

By the Coroner:

The doctor pushed up the sleeve of deceased's gown when he vaccinated him.

M. A. B. being duly sworn says:—

I am the wife of G. B., and live at ——. I am no relation to the deceased. I have known the deceased, and saw him a few days after his birth at the father's house in ——. He was a very healthy baby to look at. I saw it most days after until the mother went to service whilst it was at its father's house, until the child was about three weeks old. The mother then brought the deceased to my house. The mother came to my house because the father would not find her a home. She lived at my house in the day until some time in October. She did not sleep at my house. She stayed at my house for several days, but I cannot say how long. The mother took the deceased to a Mrs. H.'s for a few nights in ——. I minded the deceased one day and he was taken from my house to Mrs. H.'s to be minded, and was minded by her. The deceased had the breast from the mother the whole time he was with me. The first day the deceased came to me I had to send for the mother in the middle of the day, about half-past two, to feed the deceased because he was crying. She came and fed the deceased and then went back to her work. She returned back to my house again after tea between 6 and 7 o'clock. The deceased was then in good health. I saw the deceased most days while he was at Mrs. H.'s. I think Mrs. H. had the deceased from the Friday till the Tuesday morning. The mother was there with the deceased at night, and he lived with Mrs. H. in the day. I do not know how the deceased was fed. All this time the deceased was in good health. I have had five children myself, and I consider it was a fine healthy child when born and until he was about two months old, when it was poorly; it had bronchitis, but it revived again. I took the deceased to the doctor's whilst it was living at Mrs. C.'s at the request of the father—to Dr. C. L.'s. I cannot say when this would be. The doctor told us to keep it well wrapped up in flannel and rub it well with camphorated oil. I cannot say how long the illness lasted. I do not know anything about the deceased during the last ten weeks. I remember seeing the deceased a week after he was vaccinated. There was not much to be seen of the effects of the vaccination. The next time I saw the deceased the vaccination marks were in holes. I noticed nothing more beyond that they were full of corruption and matter. There was corruption running from the holes. It was not running out, but still it was running. I saw it several days, and it continued to do so. I took it across to Mr. C. L.'s the day deceased was brought to me and he ordered cold spring rags. The arm seemed to get better. I agree with the other witnesses that the arm did get better. I cannot say when I consider the arm had got properly well. I have not had anything to do with the deceased for the last 10 weeks. I noticed that the arm got well, but I do not know when the date was. I saw the deceased after the arm was well, and he was very weakly and delicate. I insured the child's life in the London and Manchester, because, if anything happened to the deceased, I thought there would be something to bury it with. I was to receive 30*s.* at the deceased's death. I was entitled to 30*s.* if it lived for three months, and if for six months 2*l.* It is a progressive insurance, and only takes effect on the death. The mother knew I had insured the deceased. I asked the mother if I should do so, and she said I might. If the mother signs her hand I suppose the money will be paid to me or the mother.

By Dr. Acland:

I took the deceased to Dr. C. L. when he had bronchitis. He was then very ill with the bronchitis. I cannot say what month it was in. Dr. C. L. made no remonstrance.

(*Question.*) Dr. C. L. told you to keep the deceased wrapped up in flannel and warm, and you suddenly take it to his surgery during the month of November whilst suffering from bronchitis?

By Dr. Acland:

I cannot say how many premiums I paid. I had the deceased insured 21 weeks. I insured the deceased long before he was vaccinated. I had no object in insuring it except to get the money to pay the parents if it died. I intended giving the money to the parents if it died. I had not insured the deceased before asking the mother. Only myself paid the premiums. I did not receive the money from anyone else to pay the premiums. I obtained the certificate of death. I did not tell Dr. C. L. that I was present at the deceased's death. He asked me which child and I told him that in ——. I did not tell him I was a person qualified to obtain the certificate. I did not tell the mother I was going to get the certificate. The mother has refused to sign the certificate to enable me to get the money because I won't promise to give her half. We have had a few words, but nothing to do with the insurance or the deceased. Neither the father nor the mother have paid any of the premiums.

By Mr. C. G.:

I asked the mother of deceased for her consent before insuring deceased's life. She did refuse to sign the paper at first, and I have not seen her since. I told her if she would sign it I would give her something to bury the deceased with. I do not know whether the Insurance Company will pay the money after this inquest is over. I have not troubled about it. The agent told me the mother would have to sign her hand. I sent for the mother down to Mrs. S.'s, and she said she would not sign her hand until after she had seen the father of the child and asked him. I said she could please herself, and nothing more has been done. I did not know when I went to the agent that I could not get the money. It was not until after I saw the mother that I consented to give her half. My children are not now insured but have been. Two are now living, three are dead, four of them have been insured. I have had insurance money on one. All my children have been vaccinated by Mr. C. L. at his surgery. My youngest is four in July and the eldest ten in June. I do not remember what took place when I took them to be vaccinated. My vaccinations went all right. Lymph was taken from some of my children, in others not. A week after being vaccinated some of them had lymph taken from their arms. Mr. C. L. asked me nothing about them. Mr. McM. attended my children, the girls, and Mr. C. the boy.

By the Coroner:

No arrangement to divide the insurance was attempted to be made until after the death. I have not made myself responsible for the expenses of the burial. I have taken no steps with regard to the payment of the expenses or making myself responsible in any way.

C. P. being duly sworn says:—

I lodge at ——. The house is Mrs. C.'s. I am the father of the deceased. I have been in the house and frequently saw the deceased from birth until death. I removed the deceased from Mrs. C.'s to Mrs. B.'s house. I had no reason for making the change except that I wished to have the deceased with me. I provided for his maintenance. I have not had much experience in feeding children. I considered the deceased was properly fed. The food given to the deceased was given by the direction of Dr. S. When the deceased was ill I took the mother away from her work in order that she might look after the deceased. I provided her with a home at Mrs. S.'s. When I came home from work I had the deceased sent to Mrs. C.'s, and then when it was bedtime the mother would take deceased away. I saw the deceased after he was vaccinated. I found the arm was very bad. The arm got well. I should think the deceased's arm got well a fortnight or three weeks before the deceased's death. The deceased never recovered after its vaccination. I do not know anything at all about the insurance beyond that an agent called for the insurance money. I did not know the deceased was insured by Mrs. B. The burial expenses of the deceased have been paid by a general subscription of friends.

By Dr. Acland:

I was not paying Mrs. S. for the keep of the mother and the deceased. I knew nothing at all about the deceased being insured.

(*Question.*) All the time that the deceased was ill am I right in understanding that you had it in your house until night and then that the mother took it home in the cold?
(*Answer.*) I used to live next door.

M. C. being duly sworn says:

I am the wife of J. C. and live at ——. I knew the deceased. I first saw him when he was staying with Mrs. C. when he was taken to be vaccinated. I had seen him once the week before at Mrs. C.'s; he seemed to be as nicely as could be, getting round from being ill; he looked thin and miserable. I do not know whether he was a strong or delicate child; he had been ill and was getting better. If he had been my child I should have taken him to be vaccinated; the deceased was taken by H. C. with me

and vaccinated by Dr. C. L. in my presence, and vaccinated with the lymph taken from my child. My child was a strong, healthy child. My child has not had any illness through vaccination. I saw deceased again in about a week, it had been taken to be inspected. I noticed the marks, and I thought they were going back. I noticed deceased's arm was very bad because there was corruption and matter coming out of the marks. I did not see deceased again after it left Mrs. C. until a few days before his death; the arm then seemed nicely as though it was getting well; deceased himself was very ill; he died shortly after I saw him. I do not know much about how the child was nursed or taken care of.

By Dr. Acland:

I should not have been at all surprised if the doctor had said the child was not to be vaccinated; deceased was getting well from being bad, and I know deceased was bad from being vaccinated. Mrs. C. L. entered the name in the book. She did not ask whether the deceased was well or anything.

By Mr. C. G.:

My baby was vaccinated from the child of Mrs. W., who lives at ———. She has told me her baby is going very nicely; when I took my baby it was very red. I told the doctor to be careful what he was going to do; the child's arm was swelled, and there was a good deal of redness all about it. I am now speaking of my own child. The redness was close on to the elbow, it did not go very far up towards the shoulder. When Mr. C. L. was taking the lymph I told him to be careful what he was going to do, and told him he had put four pock marks on his little arm; this was the time the deceased was vaccinated. The doctor pushed up the sleeve and just cut the arm. Mrs. C. L. spoke to the girl who was with deceased, and told her to go and sit on the bench until deceased's arm was dried. I took my child for the doctor to see it. When the doctor cut the arm a little blood came from it. I called the little girl who was with deceased up to have deceased vaccinated after mine had been vaccinated. Dr. C. L. asked if it was going to be vaccinated, and I told him "after mine." Mrs. C. L. then only asked the child's name, and Mrs. C. L. put the name in the book.

(*Book referred to was here produced.*)

Mr. C. L. then vaccinated. Nothing else was asked respecting the deceased; the doctor did not ask whether the deceased had been ill or anything, he did not turn up his little clothes and look at him; he did nothing except take hold of his arm and then vaccinate it; he could have seen that my baby's arm was red and swollen. I have had four born, three vaccinated, and those were all right; their arms were well in a few days after being vaccinated. Mrs. W. that my baby was vaccinated from I did not know before. On the day that the matter was taken from her baby I knew her. When Dr. C. L. took the matter from her baby he asked if the child was well, and she said "Yes, all that is the matter with them is poverty." Dr. C. L. did not ask me anything about my children or how many children I had had.

By the Coroner:

I have no complaint to make as to the way in which my child was vaccinated.

C. L., L.R.C.P. Edin., L. S. Apoth. Lond., M.R.C.S. Eng., being duly sworn, says:—

I am a surgeon practising at ——. I have no record of attending the deceased until it was vaccinated, viz., December 23rd, 1891. I am Public Vaccinator for ——. I produce my vaccination register, and there is an entry on 23rd December 1891 on F. S., as follows:—

No. of Case. (Consecutive and to be repeated.)	Date of Vaccination.	Name.	Age. Months.	Place of Residence.	Where vaccinated.	Name or Number in Register of the Subject with whose Lymph the Vaccination was performed.	Initials of the Persons performing the Vaccination.	When and where inspected.	Initials of the Person inspecting.	Result successful.	Date of sending Certificate to the Vaccination Officer.
117	1891 Dec. 23.	F. S.	Three	— —	Surgery	110	C. L.	Dec. 30 Surgery.	C. L.	Yes.	Dec. 30

The lymph was taken from the child of M. C., entry No. 110, named J. C. This entry refers to the deceased child A. F. S. Deceased was inspected in the usual way on the following Wednesday. I did not notice anything special when it was brought for inspection. No redness or inflammation whatever when brought for inspection. The register also contains all the entries of a number of persons who were vaccinated on the 30th December. I have no record in my register that any lymph was taken from the deceased. The deceased was brought to me about 10 or 12 days after the vaccination; it was in a filthy, dirty state. There was a dirty bread poultice which had been fastened round the arm. I warned them and had the bandage removed, and for the sake of cleanliness I told them to apply cold spring water. I cautioned the person who brought the deceased to have the deceased kept clean, and to apply cold-water bandages for the sake of cleanliness. The deceased was brought again to my surgery almost daily until the time of his death. I thought deceased was being subjected to improper feeding, and I warned them. I told them to feed the child properly, and to give milk, which is a good nutriment, instead of which they were feeding him upon bread and cold water. I warned them that the diet was improper. The deceased was in a bad state, and I consider he was not treated properly. When I attended deceased I found he was in one house in ——, and then in another. Most decidedly I consider the deceased was being neglected in not being seen to properly, and not having proper diet. I consider that the conditions of the arm which have been complained of arose from the fact that the deceased was not properly cared for after vaccination, and did not receive proper diet. The deceased was pushed about from one house to another, and ultimately died from convulsions brought on by want of proper nourishment and neglect. If the child had not been strong and healthy when it was brought from surgery to be vaccinated I should not have vaccinated it. I believe the deceased died from convulsions brought on by improper feeding and neglect.

By Dr. Acland:

(*Question.*) Am I right in assuming that it is your custom to examine the arm before taking lymph from it?

(*Answer.*) Most decidedly.

By Mr. C. G.:

The entries in my register were made by Mrs. C. L. under my inspection and with my consent.

(*Question.*) Have you no instructions from the Local Government Board which make it necessary for the entries to be made by you?

(*Answer.*) I have never been told that Mrs. C. L. should not do my writing. I have been told that I must perform the operation.

(*Question.*) Kindly look at the register of the vaccinations performed on December 30th; E. W., W., S., U. Lymph 110 came from J. C.?

(*No answer.*)

(*Question.*) E. W., W., S., U.; who were they vaccinated from? I want you to tell the Coroner what children were vaccinated on the 30th December, and who were they vaccinated from?

(*Answer.*) They came from H.

(*Question.*) May I take it that all those children were vaccinated from one source?

(*Answer.*) Yes.

(*Question.*) Now, Mr. C. L., you say that when you went to see the deceased after the vaccination it was in a filthy state?

(*Answer.*) I have not a very retentive memory.

(*Question.*) What state was deceased in when brought up for inspection?

(*Answer.*) I think it was moderately clean. I won't pass a decided opinion. I don't remember exactly the condition the deceased was in. I did not know the deceased was fed on bread and water before it was vaccinated.

(*Question.*) How long before his death did you see the deceased?

(*Answer.*) I think I saw the deceased a day before his death. It may have been two or three days before. I will not pledge my oath to it at all. I believe, as far as my memory goes, I saw the deceased a day or two before the deceased died. Mr. S. was attending it as well. The deceased was brought to my surgery every day, and, to the best of my knowledge, I saw him a few days before he died. The deceased was at his worst about 12 days after the vaccination. The state of the arms was that the marks had been taken off. There was a discharge to a certain extent as there will be after vaccination.

(*Question.*) Now you do not remember anything at all about the treatment of the deceased before its vaccination?

(*Answer.*) I do not. I was not in personal attendance.

(*Question.*) And, therefore, when the deceased was brought to you for vaccination you knew nothing at all about it?

(*Answer.*) I thought it was a strong, healthy child brought to the surgery. I do not know anything about the previous health; all I know about it was that I then saw, and I considered the child was healthy and strong and fit for vaccination.

(*Question.*) You said just now you considered the child healthy and fit for vaccination. Did you put any question to those who brought it?

(*Answer.*) I remember it was a child who brought it, to the best of my memory. I do not remember the question I put. I thought it was a strong, healthy child, free from any eruption.

(*Question.*) Did you lift the deceased's clothes up?

(*Answer.*) I did.

(*Question.*) Did you examine the deceased's thighs?

(*Answer.*) I did. I examined the child thoroughly, and I considered it a thoroughly healthy child. I did not remove the deceased's clothes. I examined the deceased also about the head a bit. I say that if Mrs. C. says no examination was made she is telling a falsehood.

(*Question.*) Do you remember whether, when you took lymph from Mrs. C.'s child, you made the blood come?

(*Answer.*) If anyone says that it is a falsehood. I know this for certain, that I took lymph, but not blood.

(*Question.*) Are you prepared to swear that no blood came from Mrs. C.'s child when you took the lymph?

(*Answer.*) Yes; if she says that she is telling a falsehood.

(*Question.*) Now you told us just now that you thought the deceased was in danger from filth and improper feeding after the vaccination?

(*Answer.*) I do. I told the people who brought the child.

(*Question.*) Who did you tell?

(*Answer.*) I do not know who they were. I said it to the person or persons who brought the deceased to my surgery. I cannot say whether deceased was always brought to my surgery by the same person.

(*Question.*) Mrs. C. L. keeps the register?

(*Answer.*) Yes.

(*Question.*) That register shows, if you will look at December 30, No. 122, in the column from whom the child is vaccinated, is 117, and that child is A. F. S.?

(*Answer.*) Quite right.

(*Question.*) So that what you told the Coroner just now was wrong? It may have been so.

(*Answer.*) It may have been so. I am not aware that I am obliged to keep the register. I have had several Government grants.

(*Question.*) When you were appointed did you receive printed instructions from the Local Government Board?

(*Answer.*) I did.

(*Question.*) Where are they?

(*Answer.*) At my house somewhere.

(*Question.*) When did you last see them?

(*Answer.*) I do not remember when I last looked at them. I cannot swear whether I have looked at them for the last 10 years. I have not had some other cases recently in which the vaccination has not been normal. This child A. F. S., was ill after vaccination.

(*Question.*) How many cases have you had since the child A. F. S. in which the case has been other than normal?

(*Answer.*) I do not remember. I think there may have been two or three children ill after vaccination; ignorant people have said it has been dependent on vaccination. I inquired from Mrs. C. if the child had any eruption. I did not ask Mrs. C. whether it was her first or second baby. I do not ask the mothers before I take lymph from the arm how many children they have had. I examined Mrs. C.'s child before I took lymph to vaccinate this child. I do not remember when I made it. I made an examination of M. C.'s child when the child was vaccinated. I believe I examined it when it came for inspection; I cannot say for certain.

(*Question.*) Have you no recollection at all of what you did on the day when the child came up for inspection?

(*Answer.*) No.

(*Question.*) Are you prepared to swear that you saw this child, A. F. S., within a week before its death?

(*Answer.*) I will to the best of my recollection. I saw the deceased two or three days before it died.

(*Question.*) If three or four witnesses came here and swear you never saw the deceased for a week before its death?

(*Answer.*) I should say they were telling a falsehood. I am not aware that either of the children, L. or W., are dead. A child named R. has been ill. I have had calf lymph recently. I do not know of any other alteration.

By the Coroner:

Unless I am perfectly acquainted with all the people I prefer calf lymph to human lymph. My vaccination register is kept by Mrs. C. L., under my inspection and with my permission.

R. H. S. being duly sworn says:

I am assistant to Dr. C. L. I am L.R. Ed. Coll. of Physicians. I have been with Dr. C. L. for about two-and-a-half years past. I attended on the deceased first on Thursday, October 20th. The deceased was then suffering from bronchitis. He was very bad indeed. I prescribed for him. He was brought to the surgery by Mrs. B. I gave directions for the deceased to be kept in the house. I made a careful examination of the deceased. I formed the opinion that it was a very delicate child. I next saw the deceased on the 28th October at the surgery. The deceased was then better as regards bronchitis, but still very weak and ill. On November 24th the deceased was brought again. I am not sure whether I saw it or whether Dr. C. L. saw it. I saw it again on the Saturday as it died on the Sunday morning. I was away from —— for a period of two months, and did not see deceased again until about three weeks before he died, when, at Dr. C. L.'s request, I called at ——, when I found the arm was quite well. I only called for the purpose of seeing the arm. The deceased looked very weak and bad. I always give directions as to the food to be given to children. I next saw the deceased on the Saturday before the Sunday

when it died about 5 o'clock. I saw it at about 10.20; it was lying on the sofa downstairs by the fire. It was in a fit of convulsions. I told them to give it just a little brandy and milk. It could not swallow anything. I told them the child was dying. The child was then past aid. The deceased was very thin and emaciated.

By Mr. C. G.:

(*Question.*) Do you agree, Mr. S., that when you saw the child it was in a filthy state?

(*Answer.*) It was not then. I saw it three weeks before its death; it was not filthy then. I saw it twice in October and once in November. It was as fairly well kept as a child of that class would be. I did not give a certificate. Mr. C. L. gave the certificate.

A. C. being duly sworn says:

I am M.B., Mast. Surgery, Glasgow, and practise at ——. I did not treat the deceased during lifetime. By direction of the Coroner I made post-mortem examination on the 19th April last. I examined the brain, which I found normal and healthy. I opened the chest. I examined the heart which I found normal. I found the lungs unusually red in greater part, and at the bottom of the right lung I found that perfectly solid. I made a section into the solid portion of the lung, and there was no crepitation on pressure, and pus exuded from the portion of the lung. The solid portion of the lung was of a dark red colour. I then opened the abdomen and found an absence of mesentery, the bowels empty, except in the upper few inches, and very thin and attenuated.

External appearances.—The child wasted to a skeleton. Eyes sunken deeply, skin shrivelled, weight of child 6 lbs. 6½ ozs. No vestige of fatty tissue could be found in the body.

Vaccination marks.—On the left arm were four vaccination marks forming a square; the upper and outer of these four marks was puckered indicating that there had been matter discharged from the arm. The other three marks looked normal.

Cause of death.—In my opinion the cause of death wa inflammation of the lungs with improper feeding. The condition of the lungs would have produced death even if the child had been properly fed. The inflammation of the lungs would account for the emaciated condition of the body. Vaccination would have nothing to do with these conditions. Vaccination would not produce this inflammation of the lungs or the emaciated condition of the body. The solidity at the base of the lungs which I have mentioned would be accounted for by the prolonged inflammation which I should think had existed at least about six weeks. The bowels were empty except for a few inches with imperfectly digested food (bread). I do not consider that the vaccination in this instance had anything to do with the cause of death. The ordinary weight of a child of the same age as this should have been from 14 lbs. to 20 lbs.

By Dr. Acland:

There were no evidences from the post-mortem examination that the child had died from chronic blood-poisoning. I ground my belief that the child's death had nothing to do with the vaccination, because there was quite sufficient to account for death in the condition of the lung.

By Mr. C. G.:

I cannot agree that vaccination itself would tend to lessen the health of every child vaccinated.

(*Question.*) You have heard what was said both by Mr. C. L. and other witnesses as to the state of this child's arms; that there was an open sore discharging pus and that went on for some weeks; that would lessen the child's health?

(*Answer.*) Yes.

(*Question.*) And a child's health who had been so lowered would be much more likely to take other diseases and much more likely to die from them?

(*Answer.*) Yes.

By the Coroner:

(*Question.*) How do you suppose this inflammation of the lungs arose?

(*Answer.*) Originally from cold.

(*Verdict.*)

Natural causes, inflammation of the lungs; the jury adding that they did not think deceased had been properly fed and cared for through the poverty of the mother, that they thought that vaccination had a tendency to weaken the system of the deceased so that it could not battle with the inflammation of the lungs, and that they thought Dr. C. L. did not take proper care in the execution of his duties in this case.

CASE 134, REPORTED TO THE COMMISSION BY THE CORONER.

Case of F. T. Copy of the depositions taken at an Inquest held on the body of F. T., and of the verdict returned by the Jury.

The information of E. T., wife of R. T., hatter (apprentice) of ——; the said R. T. and M. H., wife of D. H., of ——, taken and acknowledged on behalf of our Sovereign Lady the Queen, touching the death of F. T., at ——, on the twenty-fifth day of April in the year of our Lord one thousand eight hundred and ninety-two before me, F. N., Gentleman, Coroner for ——, on view of the body of F. T., then lying dead within the said County of ——.

E. T., wife of R. T., hatter (apprentice), of ——, upon her Oath saith:—

The deceased, F. T., was my daughter. She was nine weeks old. She was a full-grown child at birth and appeared to be a healthy one. She was fed with the bottle and enjoyed good health until Wednesday last, the 20th April 1892. She was vaccinated that day by Dr. G. The following day she was rather cross and I nursed her the whole of the day. I and my husband went to bed the following morning at 12.30, taking the deceased with us. I gave her the bottle after getting into bed, and she fell asleep between me and my husband. My little girl aged two years and eight months slept at the foot of the bed. I awoke about three o'clock the same morning, looked at the deceased, and saw she was still asleep. My husband awakened me again at seven o'clock. He then had the deceased in his arms. She was quite dead, and nearly cold. I then ran and fetched my mother, who lives in ——. Both hands were clenched. The left foot and the left arm were drawn towards the body. When it was washed about two hours after it was found I noticed that its left foot was discoloured. The deceased was my second child.

E. T.

Taken upon Oath this Twenty-fifth day of April 1892,
Before me, F. N., Coroner.

R. T., husband of the last witness, upon his Oath saith:—

I and my wife took the deceased to bed with us about 12.30 on Friday morning last. It was fed from the bottle after being put to bed. The deceased fell asleep before I fell asleep between me and my wife. I awoke at seven o'clock the same morning. After getting out of bed I looked at the deceased, and noticing a strangeness in her appearance I lifted her in my arms, I then found she was dead and nearly cold. She was lying on the pillow on her left side. No part of my wife's body was resting on the deceased. I am positive I did not overlay the deceased. She was slightly discoloured on the left side of the face. Both hands were clenched. Both legs were drawn towards the body. There was no other discolouration about the face. I am a teetotaler.

R. T.

Taken upon Oath, &c.

M. H., wife of D. H., of ——, upon her Oath saith:—

I am the mother of Mrs. T. The deceased was a full-grown child at birth, and has had fairly good health. I do not think it was a strong baby. When she informed me she intended to have it vaccinated, I told her that I would not have it done yet, but did not interfere

further. I had no reason for saying this other than that I thought the deceased was not strong. I saw it after it was vaccinated and nursed it. It was very cross on the Thursday. I saw it again that night about 10.30. It was then asleep in its cradle. The next morning (Friday) my daughter came to me and said her baby was dead. I went with her and looked at it. It was quite dead and nearly cold. Its hands were clenched and its legs drawn towards the body. I did not notice any discolouration about the face. The deceased has not been able to take her food properly since she was fed with the bottle.

M. H.

Taken upon Oath, &c.

Verdict.

Died from Convulsions; the jury expressing an opinion that death was not in any way due to vaccination.

CASE 135, REPORTED TO THE COMMISSION BY MR. J. H. LYNN.

Case of H. C. M. S.: report to the Commission of Dr. Theodore Dyke Acland.

Vaccination. H. C. M. S., of ——, was vaccinated by Mr. A. C., Public Vaccinator, on the 16th February 1892.

Death. 12th March 1892.

Certified cause. "Erysipelas" (primary); secondary not stated in certificate, but on the flyleaf of Mr. H. T. B.'s book "septicæmia" is added.

Certified by. Mr. H. T. B., L.S.A., of ——.

Source of lymph. Direct from the arm of L. W., of — —.

Vaccinifer. A healthy child. Vaccination pursued a normal course. There was no eruption, no enlargement of glands, no excessive inflammation; the vesicles healed well in three weeks and there are now four healthy scars. The child has been in good health since birth.

Co-vaccinee. One, A. B., of ——. Vaccination normal. The arm was well in three weeks. There are now four small healthy scars without any evidence of their having been undue inflammation or suppuration. The child has had no eruption and no enlargement of glands. Her general health has been good since birth.

On the same day five other children were vaccinated at the same time from another source, but as I found no evidence that any of the vaccinations in a direct line had pursued other than a normal course I did not think it necessary to make further inquiry in this direction.

Sub-vaccinee. One, E. M., of ——. The mother informed me that the arm had been injured, and the healing of the vesicles in consequence much delayed. There were at the time of my visit three healed scars and one covered with a thick scab. There has been no eruption and no enlargement of glands or suppuration. The child was not in good health at the time of vaccination, but it has since improved.

Co-vaccinees of vaccinifer. On the same day that L. W. was vaccinated, four other children were vaccinated from the same source; namely, E. H., of ——(No. 107 in the register), A. S., of —— (No. 109), C. K., of —— (No. 110), and E. W., of —— (No. 111). I have seen and examined these children and have found that vaccination pursued a normal course in all. There was no evidence that any of them had suffered from excessive inflammation, suppuration, enlargement of glands, or eruption, and they were all in good health. These children were all vaccinated from L. D., of ——. This child I have been unable to trace; the address which was given being apparently a false one, and neither the Registrar, the Relieving Officer, nor the Postman have been able to give me such information as might lead to finding her.

Course of vaccination and illness. On the eighth day, the 23rd February, the child H. C. M. S. was inspected by Mr. A. C. The mother states that at this date the arm was inflamed from shoulder to elbow. Apart, however, from the fact that Mr. A. C. says that this is not the case, there is strong *prima facie* evidence against the truth of this statement, inasmuch as Mr. A. C., who is an experienced vaccinator, chose the child as a vaccinifer in preference to others who were present at the station. Whether it be a fact or no, the child who was vaccinated from H. C. M. S. did well and the arm showed no sign of excessive inflammation. The inflammation of H. C. M. S.'s arm, if such there was, subsided entirely, the arm appeared to heal although the scabs are said not to have adhered firmly. Nothing was noticed to be wrong until the 7th March, the twenty-first day. Three or four days before this date two of the four scabs became detached in the night, the sores discharged slightly, but they did not stick to the night-dress. It is by no means certain that the scabs were knocked off; they might have become detached owing to suppuration having taken place beneath them. On the 7th March the arm became inflamed, and Mrs. S., the mother, applied cold-water rags to it. After treating it in this manner for about four-and-twenty hours she took the child on the 8th March, the twenty-second day, to the wife of a neighbouring chemist, who ordered an application of cold cream. The next day, the 9th March, the arm being more inflamed, the child was taken to Mr. H. T. B., who ordered linseed poultices. He tells me that he had no doubt that the case was one of erysipelas, and that the swelling first appeared on the hand and foot. He says that when he first saw the child two of the vesicles had dried up and were covered by scabs and one was knocked off, but that there was nothing to show that vaccination had pursued other than a normal course. The erysipelas spread rapidly, involving both arm and leg and then spread over the body. The child's illness was very acute. Its parents informed me that five days before its death they had no idea that anything was wrong.

Treatment of vesicles. With the exception of the application of cold water and cold cream, I have not been able to ascertain that any application was made to the vesicles except under the direction of Mr. H. T. B.

Method of vaccination, previous history, &c. I have been unable to elicit anything with regard to the method of vaccination, the previous or family history of the child which would throw any light upon the case.

General surroundings. Fairly good. I have been unable to detect any sanitary defect in the house. There has been no infectious disease in the house or the neighbourhood as far as the parents know. The mother, who is a monthly nurse, had not been attending any case of septic origin, and the father, who follows no employment, tells me that, as far as he knows, he had not been in contact with any infectious disease.

Conclusion. The child died of erysipelas spreading from the vaccination wounds subsequent to the removal of two of the scabs. I have not been able to trace the source of infection, but there is no evidence to show that the erysipelas was inoculated at the time of vaccination, or was derived from some person capable of conveying the infection present at the surgery on that date. In the absence of such evidence, and from the fact that twenty days elapsed after the vaccination before any abnormal symptoms appeared, it seems to be *primâ facie* unlikely that such was the case. It is possible that suppuration took place beneath the scabs, leading to their becoming detached, and that this may have been the determining cause of the erysipelas, but of this there is no proof.

THEODORE DYKE ACLAND, M.D.

CASE 137, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of F. G. B. An inquiry was made into this case by a Medical Inspector of the Local Government Board. The following is an abstract of his report:

Local registrar's register contains entry of death on the 17th April 1892 of F. G. B., aged two months, certified by Dr. D., as from "vaccination, 10 days; abscess, exhaustion." Mr. Sweeting was directed to investigate this case, and reports to the following effect:—

The mother of the deceased child, wife of a general labourer, stated that the child was born on February 6th, 1892, and suffered no illness until after vaccination on March 26th, 1892. This was done at the surgery of Dr. P., the Public Vaccinator, on that date in four places on the left arm. All four places took nicely, and were seen by Dr. P. on April 2nd. He opened all four places and vaccinated some other children from her child's arm. On the following Saturday night (April 9) she took the

child to Dr. P., and showed him the child's "bottom," which had "breakings out like mattery heads;" there were also some on the thighs. These "heads" in a few days shrivelled up, leaving a place "looking like a burn." Dr. P. ordered some "cold cream" for them. On Good Friday, April 15th, the arm began to swell, beginning around the elbow and not around the vaccination places, and became hard. The next day this swelling and hardness had extended up to the shoulder, and on the following day (April 17th) an abscess formed at "the back of the "arm." Dr. D., to whom the child was taken on April 15th, treated the case first with bread poultices and then with linseed poultices, and on April 17th he lanced the abscess. The child died the same afternoon.

Mrs. B., the mother of the deceased, is a white serge weaver, working at a factory, and is obliged to leave her home a good deal. During the week March 28th—April 2nd, she left the deceased baby in charge of her next door neighbour (Mrs. H.). During the greater part of the following week (beginning April 4th) she placed the baby at the local *crèche*, which is looked after by Mrs. J. Mrs. B. stated that she applied cold cows' cream to the arm during the second week after vaccination "to keep the inflamma-"tion down." She and her husband and two remaining young children appeared healthy. Their house consists of four airy and tolerably clean rooms. The privy-pit is in the back garden, a good many yards from the house. Slops are hand-thrown down a gully at the back of the house. Refuse is stored in a pail and removed every week by the Sanitary Authority. The sanitary circumstances of the house are above the average. The same description will apply to Mrs. H.'s, next door, except that this house is in a much less cleanly condition than Mrs. B.'s. Moreover, Mrs. H. is a less clean-looking woman than Mrs. B.; and at the time she was looking after Mrs. B.'s three children (including the deceased baby) she had four of her own to see to.

Mrs. J., the matron of the *crèche* (which consists of three large clean, airy, well-ventilated rooms), stated that the deceased child came to the *crèche* on April 4th. He then had a cold and cough and looked ill. The vaccinated arm looked as if it had been rubbed. The child did not remain after April 8th. On Good Friday, April 15th, Mrs. B. asked her to come in and see the baby's arm. She did so, and found the whole arm greatly swollen to the wrist; all the scabs were off, and a discharge was running down the arm from the vaccination wounds.

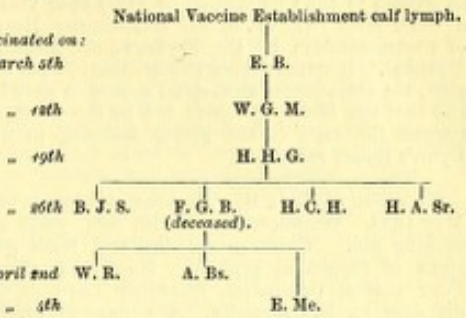
Dr. D. stated that he first saw the child on Good Friday, April 15, and continued in attendance until death ensued on April 17th. When first seen there were the remains of four vaccination pustules on the arm, which seemed "as if "they had partially sloughed off." The whole of the left arm was œdematous from the shoulder to the finger tips, and of a brawny consistence. On the morning of the seventeenth an abscess presented itself behind the posterior fibres of the left deltoid. He opened this and let out a few ounces of pus; but the child died in an exhausted state a few hours afterwards. There was no axillary glandular implication. Dr. D. stated that he attended another child (H. C. H.) that he understood had been vaccinated with the same lymph as F. G. B. The arm in this case was, he said, in much the same condition though not so bad; there was a good deal of œdema and healing was slow. There was, however, no abscess, and the child recovered. He considered the two cases much alike, except as to their surroundings, and attributed the fatal result in F. G. B's case to neglect and want of cleanliness on the part of the mother.

Dr. P., Public Vaccinator, did not personally remember the deceased. He did not see him during his illness at all, and did not remember the deceased being brought to him on the 9th April, as the mother asserted was the case. From the Public Vaccinator's register Mr. Sweeting found that the child F. G. B. was vaccinated on March 26th at his surgery from H. H. G., aged two months, who in turn was vaccinated on March 19th from W. G. M., aged five months. W. G. M. was vaccinated on March 12th from E. B., aged three months, done on March 5th with National Vaccine Establishment calf lymph.

The co-vaccinees of the deceased, done from H. H. G. on March 26th, were:—(i) B. J. S., aged four months; (ii.) H. A. Sr., aged seven months; and (iii) H. C. H., aged two months.

The sub-vaccinees of the deceased, done from him on April 2nd and April 4th, were:—(*a*) W. R., aged three months; (*b*) A. Bs., aged four months, and (*c*) E. Me., aged nine months. The latter (E. Me.) was vaccinated on April 4th, at a country public vaccination station with stored lymph taken from F. G. B. on April 2nd. The others, on April 2nd, were vaccinated at the Public Vaccinator's house in the town.

Thus in diagram:—



Mr. Sweeting visited the above cases whose vaccination was related to that of the deceased child. Healing was retarded in the cases of H. A. Sr. and E. Me., owing to the rubbing off of the scabs. But neither these nor any of the others (with one exception) had suffered any untoward effects, and their scars were quite normal. The exception was H. C. H., spoken of by Dr. D. This child's arm began to inflame on Tuesday, April 3rd, after the arm had been inspected on April 2nd, and the vesicles opened. The inflammation began around the vaccination places and extended up to the shoulders, but not below the elbow. Mrs. H. treated the case herself, using an application of "cold cream." As the arm did not seem to heal, she called in Dr. D., but not until a month after the vaccination. When Mr. Sweeting saw the child (on the 24th May) there was one scab left, but all inflammation had subsided. Mrs. H. seemed to take a much less serious view of the case than Dr. D. did, as shown, too, by her not seeking medical advice for a month.

Dr. P., the Public Vaccinator, uses an ordinary grooved lancet in vaccinating, which he does by scarification. Mr. Sweeting attended his station, when inspecting the Union, and he appeared a careful and cleanly operator. His instrument was in good condition.

Mr. Sweeting could learn of no illness of an infectious or septic nature, at either the deceased's or the H.'s, or at the *crèche*, or any of the adjacent houses. But the Medical Officer of Health stated that a case of scarlet fever had been reported to him, under the Notification Act, on April 2nd, from a house in Y. Street, quite close to M. Street in which deceased had lived. Mr. Sweeting found that this case (a boy about ten) was attacked on the 29th March. Though actual intervisiting was denied, yet Mrs. B. knows the people at this house, and they met at chapel. Mr. Sweeting learned, further, that there had been many slight unnotified cases of scarlet fever in Y. Street and other streets adjacent to M. Street, during the latter part of March and beginning of April. These were in the persons of children who attended the same school as Mrs. B.'s.

Case 138, reported to the Commission by Mr. J. H. Lynn.

Case of N. L. R.: report to the Commission of Dr. Thomas Barlow.

N. L. R., aged two years and seven months, of——.

History given to me by the mother on the the 27th May 1892. The child was born on the 10th October 1889. She was suckled till twelve months old. Was vaccinated January 1890 from a tube in four places. The arm did not "rise" much. Very little matter was taken from it at the end of the week. The places healed within a fortnight from the time of the inspection. No swellings were noticed in the armpit or the neck. One week after the day of inspection there was a rash on the face. There were distinct red spots, then others appeared all over the body. Afterwards the spots discharged. The eruption came and went. It was worse when she was six months old. She has never quite got rid of it. There have been itchy pimply spots, which have sometimes formed matter. She has been mending for the last three months.

Family history.

Father, the mother states, is strong. The mother, I observe, is rather pale, but there is nothing else of importance. There are stated to be five other children, who have, she says, a good skin, and had no rash after vaccination.

I append a copy of the statement as to the case forwarded to the Commission by Mr. Lynn, and copies of a letter from Dr. Fox, of the Westminster Hospital, and of a memorandum by Dr. Payne, of the Blackfriars Skin Hospital. It seems proper to state that, so far as evidence goes, the attendances at hospital appear to have been brief, and that the history given to me by the mother does not suggest the early or the severe suffering to which Mr. Lynn's report refers.

Condition on 27th May 1892.

Condition of N. L. R. when examined by me on the 27th May 1892. Well-developed child, two years and seven months old. Chest good; lips and teeth good. No signs of congenital syphilis. No gland enlargements. Four normal vaccination scars one third of an inch in diameter on left shoulder. A number of papules on the hands, arms, back, sides of back, thighs, and feet. One small pit left by a superficial pustule on the back of the left hand. Many small scratches on the body. One small scar on the right knee, where probably a pustule has been present.

Comments.

The history seems to show that the course of the vaccination was satisfactory, and, indeed, rather mild, so far as local reaction was concerned. There was no sign of glandular enlargement or septic infection, and the healing process was soon accomplished without attendant ulceration. The skin lesions now present are good examples of lichen urticatus, a form of skin eruption which is common in infancy, which itches extremely, and sometimes leads to sores consequent on the itching. It is a very obstinate and relapsing form of skin trouble, especially through the period of first dentition. It is impossible to say that, in a remote degree, the vaccination may not have determined its occurrence in a susceptible subject, but it is right to state that this rash often arises entirely apart from vaccination. The general health of the child is good.

It appeared unnecessary to inquire into the condition of vaccinifer, &c., as the course of the vaccination was confessedly normal.

THOMAS BARLOW, M.D.

(Copy of statement forwarded by Mr. J. H. Lynn.)

N. L. R., of ——, was born on the 10th October 1889, "a fine baby, above the average height." She was perfectly well until vaccinated on the 1st January 1890. The operator was Mr. W. M., M.R.C.S., Public Vaccinator at ——. She immediately began to fail; fretted, and failed in appetite. The marks on the day of inspection had a dull and unusual appearance, and during the week following the day of inspection eruptions appeared that rapidly spread over the entire body and head. At one time the mother says she could only compare the child to a "rotten pear."

She has been taken to the South London Dispensary, Westminster Hospital, Evelina Hospital, and the Skin Hospital, Stamford Street. Dr. B., of ——, has also prescribed for her.

The eruptions disappear and then return, and present appearances similar to the vaccine pustule. There are numerous marks of such character on various parts of the body now manifest and active. The parents are healthy and the other children. The condition of this child is a very grievous trouble and anxiety to the parents.

(Copy of letter from Dr. T. C. Fox to the Secretary of the Westminster Hospital.)

14, Harley Street,
Cavendish Square, W.
May 11, 1892.

DEAR MR. QUENNELL,

THE only likely case I can trace is:

N. R., aged 18 months, who came under my care in the Skin Department of the Westminster Hospital suffering from scabies, on March 25th, 1891. If the child was vaccinated about the usual time, say, at three months, this would make the child in March 1891 about 18 months old.

Yours very truly,
T. COLCOTT FOX.

(Copy of a memorandum by Dr. J. F. Payne.)

N. R., two years old, of——, was brought to the Hospital for Skin Diseases, Stamford Street, Blackfriars, on December 30th, 1891, suffering from an eruption on the skin which had lasted more than a year. It was regarded as a case of "infantile prurigo," or "lichen urticatus."

As the child was only brought on one occasion, nothing more is known of the case.

J. F. PAYNE, M.D.,
May 17th, 1892. Physician to the Hospital.

CASE 139 [SERIES], REPORTED TO THE COMMISSION BY MR. P. M. DAVIDSON.*

Case of B. V. B. and others vaccinated at the public vaccination station at ——, in July 1891: report to the Commission of Dr. Thomas Barlow and Dr. Theodore Dyke Acland.

(1.) *Introductory statement by Dr. Acland.*

(2.) *Joint report of Dr. Barlow and Dr. Acland.*

(3.) *Appendix by Dr. Acland.*

(1.) *Introductory statement by Dr. Acland.*

Introductory. [T. D. A.]

In May 1892 Mr. Davidson stated in evidence before the Commission that, in his opinion, "bad arms of a "suspicious character often occur, where the vaccination "wound does not heal from three to six months, and "then only after more or less specific treatment," and that in these cases "there was a certain suspicion of "syphilis." (See Mr. Davidson's answers to Questions 22,490 and 22,492.) An inquiry on the spot was subsequently instituted at the request of the Commission.

In the course of this inquiry it was found that a certain number of the cases referred to by Mr. Davidson had been vaccinated at the public station in July 1891, and since Mr. Davidson informed me that he could produce a case in which death had resulted directly from vaccination, during this period, and also a considerable number in which syphilis had been inoculated, it seemed desirable to investigate the whole of the vaccinations recorded in the register as performed at the public station during July 1891.

Limit of inquiry.

Had it been possible it would have been preferable to inquire into the results of all the vaccinations performed in 1891–1892, so as to arrive at some kind of general estimate as to the amount of injury inflicted, but it was found to be practically impossible to trace the whole of the 600 cases who had been vaccinated during this period; and it appeared that more accurate results would be obtained by limiting the inquiry to the vaccinations of July 1891, the cases vaccinated in July 1892 being also inspected and a report made upon them. (*See Case* 140 [*Series*].)

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* *See minutes of evidence of Mr. P. M. Davidson, L.R.C.P., appended to the Commission's Sixth Report, Questions 22,490-504 and 25,092-26.*

The difficulty of the investigation has been greatly increased by the inaccuracy with which the register has been kept. In many particulars it does not correspond with the rough copy made at the time the vaccinations were performed. In 11 or 12 cases the names of children appear who were not vaccinated at the public station, though the lymph used was obtained from Dr. W., the Public Vaccinator. Of the vaccinifers and the sub-vaccinees of these cases and of many others no record has been kept. Grave doubt is thus thrown upon the entries which do appear, and except in those cases which could be verified by the statements of the parents of the children vaccinated, no certain reliance could be placed on them.

In June 1893 in co-operation with Dr. W., the Public Vaccinator, and Mr. Davidson I was able to trace a very large proportion (94) out of the 106 cases vaccinated at the public station in July 1891. A summary of the results is given in the table appended to this report. (*See pages* 330-3.)

From this table, on page 330, it will be seen that, as far as can be ascertained, 26 cases were vaccinated on the 2nd July 1891. The operation was in each case performed by the Public Vaccinator (Dr. W.) with Warlomonts' calf lymph obtained from "The Association for the Supply of "Pure Vaccine Lymph."

On the 9th July, the next vaccination day, Dr. W. was absent and his place was taken by a substitute (Mr. H. W.), who vaccinated about 43 cases directly from children who came up for inspection on that day.

On the 16th July Mr. H. W. vaccinated about 17 (?) cases also directly arm to arm.

The subsequent vaccinations on the 23rd and 30th July were performed by Dr. W.

Complaints were made to me by parents of children vaccinated on the 9th and 16th July as to the method in which the operation was performed. It was stated that the vaccinator was rough, and that in some cases he caused bleeding. No complaint was made of the way in which Dr. W., the Public Vaccinator, performed his vaccinations. It should be stated that Mr. H. W. is a comparative stranger to the district and is not acquainted with the antecedents of the children. Mr. H. W. hearing of the inquiry wrote as follows to Dr. W.:—

DEAR Dr. W. December 5, 1893.

I WELL remember acting as your "locum tenens" and vaccinating for you on the 9th July 1891. My recollection of it having been assisted by your allowing me an examination of the vaccination register book, which I took to the station with me on that day. I remember the boy B. about three years old, whose vaccination had taken well, and I used him as a vaccinifer for numerous children, as the parents wished their children vaccinated from him. I should certainly make inquiry about his health, and finding that his vaccination had not been postponed for any reason of bad health I used him as a vaccinifer.

It is my custom to clean my lance after vaccinating each child and has been so for years. As a rule I finish with a vaccinifer before using another one. I well remember, however, that your vaccination station was crowded on that particular day, and there was a run made on the boy B., and I believe the register is quite correct in showing that I returned to him as a vaccinifer for two or three children after vaccinating a number from him in succession.

I feel greatly surprised that any remarks should have been made as to my neglect as regards "cleanliness" in my vaccination work.

I am,
Yours truly,
H. W.

In answer to my inquiries Mr. Davidson replied on the 20th May 1893:—"The whole of this period" (July 1891. —*T. D. A.*) "was fruitful in excessive inflammation and "ulceration, swellings in the armpit and sometimes "suppuration there, and skin affections. . . . . The "history of two of the vaccinifers who, I believe, pro-"voked most of the skin disease is instructive. The "mother of one" (No. 426.—*T. D. A.*) "has suffered "pretty frequently from some skin affection for years and "does now. Her child had a bad arm after vaccination "and when the wounds were healing broke out" (*i.e.*, had an eruption.—*T. D. A.*). "From this a child of the "mother's aunt was vaccinated and was very bad, had fits "and broke out also. But the next case is even more "instructive. This was a child three and a half years old "then, from whom nine or ten were vaccinated, a "good many of them (although I do not know how many) "breaking out before the arms were healed, or soon after. "All the children in this one's family have been subject "to skin affections and also the mother of one, I "think this one, is actually broken out now." The child referred to is B. V. B. (No. 383 in the register). Mr. Davidson subsequently stated that he had attended both the father and the mother of this child for affections which he believed to be syphilitic.

Joint inquiry with Dr. Barlow.

In June 1893 I inquired into all the cases vaccinated in July 1891, and, in view of the difficulty of the inquiry and of the serious nature of the statements made by Mr. Davidson, and of the fact that the father of the child B. V. D. (No. 383) had twice suffered from some venereal affection, thought it advisable that a second inquiry should be made in consultation with Dr. Barlow. This was accordingly done on the 3rd, 4th, and 5th September 1893. On this latter occasion we saw together the three vaccinifers alleged to be syphilitic, and the cases believed by Mr. Davidson to be the subjects of invaccinated syphilis, and the following joint report gives the result of our investigation. An appendix is added giving the details of the case alleged to have died in consequence of vaccination, and a summary of all cases vaccinated in July 1891 not included in the main body of the report.

Inquiry was made into the following cases:—

(A.)—Three alleged by Mr. Davidson to have been suffering from congenital syphilis when used as vaccinifers:

(No. 383 in register) B. V. B. } Brothers.
(No. 384 in register) G. F. B. }
(No. 454 in register) E. B.

(B.)—One alleged to be syphilitic, but whether from vaccination or inheritance Mr. Davidson is unable to say:

(No. 426 in register) A. E. L.

(C.)—Fifteen alleged by Mr. Davidson to have suffered from syphilis in consequence of vaccination:

(No. 406 in register) A. L. C.
(No. 409 in register) J. E.
(No. 424 in register) W. W.
(No. 429 in register) J. F.
(No. 440 in register) F. D.
(No. 449 in register) N. G. S.
(No. 451 in register) A. F.
(No. 453 in register) F. J.
(No. 455 in register) H. L.
(No. 456 in register) E. J. S.
(No. 458 in register) F. R.
(No. 459 in register) E. J.
(No. 467 in register) A. C.
(No. 469 in register) M. M.
(No. 484 in register) L. H.

Of the above, E. J. S. (No. 456 in register) is the case referred to by Mr. Davidson in evidence before the Commission, in his answers to Questions 23,106–26.

Inquiry was also made into all the co- and sub-vaccinees of the above cases as far as they could be traced. The latter are as follows:—

(i.) Sub-vaccinees of B. V. B. (No. 383 in register).

Nos. 411,	Nos. 416 (?),	Nos. 423,
412,	417 (?),	424,
413,	418,	425,
414,	419,	426, and
415,	421,	428 (?).

Of these, Nos. 416 and 417 appear in the register as vaccinated from B. V. B. (No. 383 in register), but it is very doubtful whether this is correct.

Nos. 412 and 421 are dead.

Nos. 415 and 428 have left —— and could no be traced.

(ii.) The sub-vaccinee of G. F. B. (No. 384 in register) is uncertain.

(iii.) The sub-vaccinees of E. B. (No. 454 in register) are unknown.

(iv.) The sub-vaccinees of A. L. (No. 426 in register) are believed to be Nos. 457 and 458, and possibly 459.

(v.) The sub-vaccinees of A. C. (No. 406 in register) are doubtful, but possibly they are Nos. 450 and 451.

THEODORE DYKE ACLAND, M.D.

(2.) *Joint report of Dr. Barlow and Dr. Acland.*

(A.)—Cases alleged to have been suffering from congenital syphilis when used as vaccinifers.

Case of. B. V. B. (No. 383 in register).

Vaccination. 2nd July 1891, when 3½ years old, by Dr. W., Public Vaccinator.

Source of lymph. Calf lymph supplied by the Association for the Supply of Pure Vaccine Lymph.

Co-vaccinees. Twenty-five. Nos. 381 to 405 in register. Of these, one, 384, is brother to the subject of this report; three, Nos. 387, 390, and 400, could not be traced; and three, Nos. 389, 394, and 396, have since died from causes unconnected with vaccination, the certified cause of death in each case is given in the summary at the end of the report.

Of the 22 cases, the history of whose vaccination could be obtained the result was normal in 20. Of the remaining two cases, one (No. 386) was ultimately satisfactory; one No. 399) unsatisfactory.

No. 386. O. W. There was some excess of inflammation round the vesicles during the second week. Cream was applied to the wounds with a feather. Recovery was complete without complication.

No. 399. F. C., a feebie child, who had suffered from stomatitis before vaccination. According to mother, the arm made satisfactory progress for two or three weeks, though there was a good deal of thick purulent discharge from the wounds, which were treated at first with cream, and afterward's with ointment. They are said not to have healed for two or three months.

Sub-vaccinees. A large number of mothers wished to have their children vaccinated from B. V. B., as he was a fine child, and seemed so healthy and well. For reasons given in the introduction, it is not possible to state with certainty the number of children vaccinated from him, but, as far as can be ascertained, 12 certainly were.

Of the cases known to have been vaccinated from him, one, No. 424, H. E. W., is alleged by Mr. Davidson to have suffered from syphilis, in consequence of vaccination, and one, A. L. (No. 426), to have been syphilitic either from inheritance or in consequence of vaccination, but, in our opinion, neither H. E. W. nor A. L. show any evidence of invaccinated syphilis, and the evidence as to congenital syphilis in the case of A. L. is quite inconclusive. The histories of these two cases are given in detail on pages 326 and 324 respectively of this report.

The other ten cases are as follows:—

No. 411. J. S. The mother states that on the eighth day the arm was swollen and inflamed from shoulder to elbow. It was red for a week, then began to get better, and the scabs came off in about a month. The wounds continued healed for about a week, and then "festered up" again "just as if they had been vaccinated afresh." The arm inflamed for the second time, and discharged a great deal, continuing to do so for five or six weeks. The child had no enlargement of glands in the axilla, and no eruption on its body until 12 months after vaccination, when it had some eczema on the scalp. The vesicles were treated with buttermilk and cream on the first occasion, and afterwards with buttermilk and ointment. The mother thinks that they may have been rubbed, but she does not know that they were. There are now (June 1893) four scars, showing that there has been considerable ulceration. The child had a clear skin in June, but in September had some impetigo on the knees; it was well nourished and healthy looking. The viscera appear to be healthy. The bones are natural. There is no enlargement of glands, and there is no evidence that the child is the subject of invaccinated or congenital syphilis. The family history is, as far as could be ascertained, good. J. S. is the youngest of six children, one of whom at the time of inspection was suffering from considerable impetigo of the head.

No. 412. T. W. C. Vaccination is said by mother to have been without complication. The child died when it was about 12 months old, on the 11th February 1892, seven months after vaccination. The certified cause being "tuberculosis."

No. 413. J. P. The information about this child is meagre, owing to the fact that his mother has recently died of phthisis. There is said to have been some excess of inflammation round the vesicles during the second week. Vaccination was otherwise without complication. There was no rash on the body. The child is now (June 1893), two years after vaccination, sturdy and well grown with a clear skin, and shows no evidence of syphilitic infection. It has some slight photophobia resulting from a minute superficial ulcer on one cornea which is of recent origin; in September 1893 there was a small opacity on the cornea. The vaccination scars were healthy with no sign of ulceration.

In Nos. 423 and 425 vaccination was normal. Both children are now (June 1893) well, and neither of them showed any traces of syphilis, invaccinated or congenital.

In four of the remaining five children *Nos. 414, 418, 419, 420,* vaccination was without complication, and none of them show any sign of syphilis congenital or acquired.

No. 415 could not be traced.

The names of three other children are given in the register as having been vaccinated from "B.," viz., Nos. 416, 417, and 421, but the mother's statements do not confirm the register. One of these three children, No. 421, died on the 16th September 1892, aged seven months, of "diarrhœa, five days; exhaustion." The illness was acute, and the mother states that previous to it the child had entirely recovered from the effects of vaccination. In all three cases vaccination is said to have been without complication, and in the two who are living there is no evidence of syphilis.

It appears from the numbers in the register that the vaccinations from B. V. B. were not done consecutively, and this is admitted by Mr. H. W.; it is therefore probable that 416 and 417 were not vaccinated from him, but it is possible that they were vaccinated from his infant brother (No. 384). It is probable that 420 and 422 were vaccinated from an entirely different source, viz., No. 391.

It will thus be seen that of all the children vaccinated from B. V. B. not one presents any evidence of invaccinated syphilis, and in the case of A. L. the evidence of congenital syphilis is quite inconclusive.

Course of vaccination. Vaccination is stated by the mother to have pursued a normal course up to the eighth day, and subsequently to have been followed by very little inflammation, the arm was quite healed in one month. 14–21 days after vaccination the left side of the face and neck became red and much swollen; the swelling filled up the whole of the angle between the jaw and the neck, and nearly closed the eye. It got well without medical treatment in about a fortnight and was only bathed with warm water. The mother as soon as she could get a view into the mouth noticed that the child had some carious teeth in the lower jaw, on the same side as the swelling. Mr. Davidson saw the child when it had this swelling, and states that, in his opinion, it was suffering from "a node" upon the lower jaw, and looks upon it as an evidence that the child was suffering from congenital syphilis. It should be noted that the swelling disappeared without the administration of any specific treatment, and that there were carious teeth present at the time, which it is reasonable to suppose were concerned in starting the inflammation. Soon after the swelling of the face subsided, the child's eyes began to inflame, and there was a good deal of purulent discharge from them, and much photophobia. They were treated by Mr. Davidson, who informs us that he believes the child was suffering from iritis and keratitis, both of which he considered to be evidence of syphilis.

Previous history. His mother states that the child has had good health before and since vaccination; troubled only by the congenital malformation (a form of hermaphroditism) from which he suffers. He has had no eruption on his body and no snuffles.

The child is moderately nourished, with a clear skin. There is slight general swelling of the left cheek, which is sufficiently accounted for by a gumboil below the left lateral incisor. There is, too, some thickening of the soft parts along the lower jaw, and some enlarged glands under the jaw. The four back teeth on the same side are merely decayed stumps. The upper central incisors are missing. The lower incisors are irregular and badly formed. At the right angle of the mouth there are some minute scars. The mucous membrane of mouth and pharynx is healthy. The base of the nose is a little thickened and slightly depressed. There is no nasal catarrh or ozœna. The pupils are equal and act well to light. There is no sign of old iritis. There is a minute nebula in each cornea about the size of a small pin's head, well defined and opaque; they give the impression that they are due to simple corneal ulceration and not to syphilitic interstitial keratitis. This view of their origin is supported by the opinion of Mr. Hutchinson and Mr. Lawford, F.R.C.S. There is no disease of choroid or retina. There is no evidence of any affection of the long bones or skull. The viscera are healthy. The head is well formed. There are three healthy-looking, well-foveated vaccination scars and there is no enlargement of glands in the armpit.

Mr. Hutchinson examined the child and writes on the 21st September 1893 as follows:—"I may briefly say that "I could not find in the child (B. V. B.) you brought to "me any indications which are conclusive as to its being "the subject of inherited taint. There are some suspicious "features, but nothing more, and the diagnosis must rest "upon the family history."

From the above it will be seen that the evidence of congenital syphilis are of the slightest kind, and consists in a little broadening of the root of the nose with no history of "snuffles" or proneness to nasal catarrh, and an almost imperceptible scarring of the right angle of the mouth. The swelling of the lower jaw to which Mr. Davidson referred, and the vestiges of which we saw in September 1893, seem to be due to the irritation set up by carious teeth, and not to be of syphilitic nature. The two upper central temporary incisors are absent and the lower ones are irregular. The permanent ones have not yet been cut and are not available for the purposes of diagnosis. Taken apart from the family history, the evidences of inherited syphilis are very slight, *and in any case there is no evidence that at the time of vaccination (when he was 3½ years old) the child presented any lesion which was capable of transmitting syphilis to others.*

Father.—I. B., a slightly built, unhealthy-looking man. He states that in 1876, two years before his marriage, he contracted gonorrhœa for which he was treated and got well; in 1877 he suffered from a sore on the penis which Mr. Davidson treated, and at the time believed to be syphilitic. Mr. Davidson has no record of the case made at the time, beyond the entry made in his day-book, which we saw dated the 16th May 1877, showing that "B., jun." was treated at this time with iodide of potassium and mercury. The chancre was followed by sore throat, and Mr. Davidson states by a roseolous eruption; but of this eruption Mr. B. has no recollection. Treatment was irregularly carried out, but no other secondary or tertiary symptoms have shown themselves. Mr. B. states positively that he has not contracted any venereal disease since his marriage.

Mother.—Mrs. B. is a feeble woman just recovering (June 1893) from her confinement and suffering from "phlegmasia dolens." She has been seven times pregnant, and all her children have been born at full time. She has had no miscarriages. The only discoverable symptoms suggesting syphilitic infection, is that last year (1892) she suffered from some eruption on the hands which Mr. Davidson treated as "palmar psoriasis." Mrs. B. states that the eruption commenced on the palmar surfaces of the last phalanges of two fingers gradually spreading to the dorsum of the hand and the anterior surface of the wrists; she says that it was at first dry and scaly, extremely irritating, and when scratched exuding a thin watery discharge. It lasted for some months, and resulted in the loss of one nail. She has not suffered from sore throat, and the pharynx is healthy.

Her seven children were as follows:—

(1.) *J. W.*—A full-time child; is said to have been strong and healthy with no stuffiness in the nose, and to have died, after two days' illness, of croup on the 25th January 1881, aged eight months. Vaccination had been without complication of any kind.

(2.) *I. W.*—Aged 10 years. A full-time child. He is said to have always had good health. He has had no eruption on his body. His complexion is clear, there has been no affection of the eyes, nose, nor ears. His permanent teeth are normal, his cornea clear, his nose is well shaped, his viscera are normal, and he has no symptom pointing to congenital syphilis. Vaccination was without complication and there are three normal cicatrices.

(3.) *L. B.*—Aged nine, was born at full time. She did not suffer from snuffles nor eruptions after birth. She was, Mrs. B. says, vaccinated when 10 months old from a child who had a severe eruption on the face, the wounds healed well, but about 14 days after vaccination an eruption broke out on her face and head which was very irritating, it is said to have commenced as small blisters from which there was much watery discharge drying into yellow scabs. In 1886, when two years old, she was treated for eczema at the —— Infirmary and recovered entirely in three or four weeks. Since this time she has had occasional outbreaks of the same eruption, especially on the flexor surfaces of the joints. She is now (June and September 1893) a fairly healthy-looking child with a clear, fresh complexion. The forehead is prominent. The eyebrows slightly marked. *Nose*, a little broad at its base. *Teeth*, irregular, but not indicative of syphilis. At the corners of the mouth on both sides is one linear cicatrix. On the forehead there are discrete scars, as of some ulcerative eruption. *Hearing*, good. No enlargement of abdominal viscera. There is some slight eczema behind the ears. The child's appearance is not suggestive of congenital syphilis, except for the scars about the mouth and forehead, but they seem to be the result of the eruption which followed vaccination, which was severe and persisted until properly treated.

(4.) *E.*, a full-time child who did not suffer from stuffiness of the nose as a baby. The vaccination vesicles healed well; about two months afterwards an eruption broke out on his body, sometimes dry and sometimes discharging. He is now (June 1893) seven years old. He is thin, but looks fairly healthy. There is a patch of eczema at and below the flexure of the right knee. There is slight thickening of the root of the nose. The corneæ are clear; the teeth regular; the hearing good: no disease of viscera or bones detected. The vaccination scars are healthy. There are no cicatrices at the corners of the mouth. His appearance is not suggestive of congenital syphilis.

(5.) *B. V. B.*, the subject of this report. No. 383 in the register.

(6.) *G. F. B.* (No. 384 in register.) A full-time child he had no rash or snuffles after birth. He was vaccinated on the same day as his brother B. V. B. Vaccination was without complication of any kind, and according to Mrs. B. was not followed by any eruption. He is a well-nourished child, fairly healthy looking, but with a projecting forehead, and when seen in June 1892 had much muco-purulent nasal discharge, this, according to Mrs. B., lasted only a few weeks, and in September 1893 the child was well. Now (June and September 1893) he has a lichenous eruption on his body, partly papular and partly vesicular. His nose is a little thickened at the base. His corneæ are clear. Bones, no nodes or periosteal thickening detected. Viscera, natural. Nutrition, fair. The three vaccination scars are healthy. His appearance is suggestive of the possibility of his being the subject of inherited disease.

(7.) *W.*, an infant seven weeks old (June, 1893); puny and emaciated, with wrinkled face. There is a dusky papular eruption on nates and round anus, extending down the inner surface of the thighs and legs as far as the ankles, and upwards over the abdomen. On the trunk, lower lips, and face, the papules are discrete, dusky red, with fine scaly tops. The child has suffered from "thrush" and coryza, with considerable obstruction to the nasal passages. It has had no diarrhœa. *It is hand-fed, and badly fed.* Its appearance strongly suggests that it is suffering from congenital syphilis.

When seen for the second time in September 1893 the eruption on the nates had faded and become more uniform, but the child's nutrition was much impaired. It had been treated by Mr. Davidson with grey powder. Its nutrition was bad, but it had been hand-fed.

Summary.

The most important facts in the foregoing record seem to be:—

(1.) That B. V. B. was 3½ years old when used as a vaccinifer, and that there is no evidence that either at the time or previously he had shown any symptom of inherited syphilis.

(2.) That of the 12 children vaccinated from him not one, in our opinion, shows (September 1893) any signs of acquired syphilis.

(3.) That although I. B., the father, admits that he had twice suffered from venereal disease before marriage; his first five children (of whom B. V. B., No. 383, was the fifth), were all born at full time, and as far as can be ascertained none of them have shown any active manifestation of inherited syphilis, although the eldest of them is now 10 years old.

(4.) That the one child of the B. family who bears unmistakable evidence of syphilitic inheritance was born nearly five years after B. (No. 383), and has not yet been vaccinated.

Case of. E. B. (No. 454 in register).

Vaccination. 16th July 1892.

Source of lymph. Direct from arm of a child, probably 422.

Vaccinifer. No. 422 (?), G. J., a healthy child in whom vaccination pursued a normal course. This child was in turn vaccinated, it is believed, from No. 391, whose vaccination with calf lymph was also normal.

Co-vaccinees. Uncertain, but possibly Nos. 455 and 456, whose cases are recorded on page 327.

Sub-vaccinees. Uncertain, but probably several.

Course of vaccination. Vaccination was normal. The wounds healed quickly and well, and there are now four normal cicatrices. A week or two after the arm was well an eruption broke out on the child's face and head, consisting of raised yellow scabs with much discharge, and some offensive smell. This eruption got well, but returned two or three times; it did not affect any part except the head and face. When seen for the first time (June 1893) the child was suffering from impetigo of the face, some eczema of the vulva and fold of the groin, and there were three small pustules on her thighs which had been present for 14 days. The rash was extremely irritating and had been much scratched. On the 3rd September 1893 the eruption was almost entirely well, and had left no scars of any kind.

Present state. Neither in June nor September 1893 had the child any mucous tubercles or redness round the mouth or anus. The complexion was clear. The bones were healthy, without any appearance of nodes or periosteal thickening. The abdominal viscera were of normal size. The corneæ were clear. The nose was natural, and there was no catarrh. There were a few ill-defined lichen spots on the back.

Previous history. E. is the third of four children. She is stated by the mother to have had good health both before vaccination and since. As an infant she had no rash or snuffles.

Family history. *Father*, aged 36, a fairly healthy-looking man; he says that he has never suffered from any venereal disease. He has not suffered from eruption on the skin, sore throat, nor affections of the eyes or bones. There is no evidence of old iritis, nor ulceration of palate. No evidence could be obtained giving any ground for the supposition that he had contracted syphilis.

Mother, not very strong, but with no actual ailment. She has had four children all born at full time and no miscarriages. She absolutely denies Mr. Davidson's statement that she had two miscarriages before marriage. As a child she had corneal ulcers, and now has two minute nebulæ. Her teeth are regular. She has some slight pitting of her face. No evidence could be obtained that she was the subject of inherited or acquired syphilis.

The four children are as follows:—

(1.) *C. W., aged* 5; when 3 years old had a "breaking out all over." There are now no deep scars, but one cicatrix on the back and one on the abdomen. Appearance, healthy. Nutrition, good. Complexion, clear. Teeth, regular. Corneæ, clear. Liver and spleen, normal. Vaccination was normal, there are now four normal scars. No evidence of congenital or acquired syphilis.

(2.) *M. E., aged* 4. Appearance healthy. No cicatrices about mouth or anus. Complexion, clear. Nutrition, good. Abdominal viscera, natural. Nose, natural. Corneæ, clear. Three normal vaccination scars. No evidence of congenital or acquired syphilis.

(3.) *E.*, the subject of this report.

(4.) *J.*, the youngest child, aged 14 weeks (in September 1893). Appearance healthy. Complexion clear. Nose natural. Nutrition good. Liver and spleen not enlarged. When first seen (June 1893) she had some nasal catarrh, which lasted a few weeks only, and was quite well in September. She has had no rash. No evidence of congenital or acquired syphilis. She has not been vaccinated.

Summary. As the result of our examination we are of opinion that there is no ground for supposing that either E. B. (the vaccinifer), or any of the other members of the family have suffered from syphilis, congenital or acquired.

(B.)—Case alleged to be syphilitic, but whether from vaccination or inheritance Mr. Davidson is unable to say.

Case of. A. E. L. (No. 426 in register).

Vaccination. 9th July 1891.

Source of lymph. Direct from arm of B. V. B., No. 383.

Vaccinifer. Three years old at time of vaccination, as far as can be ascertained in good health. For details of this case, see page 322.

Co-vaccinees. Probably 11; see under B. V. B., No. 383, page 322.

Sub-vaccinees. Probably two. In one, No. 457, vaccination was normal; in the other, No. 458, vaccination was followed by an eruption (see page 328).

Course of vaccination. According to the mother the arm was inflamed by the eighth day, and one scab covered all four pocks; about this time an eruption of "red blotches" rather larger than a pin's head broke out all over the child's body, causing much irritation. The eruption lasted a week or more, but had entirely disappeared "long before the arm was well." The vesicles were treated with buttermilk, and are said by Mrs. L. to have been healed in three months.

Previous history. A., is the eldest of two children, she was born at the seventh month, and was so feeble that she was not expected to live. The mother endeavoured to conceal her pregnancy as she was unmarried. She laced tightly and this may have caused the premature confinement. When two weeks old she suffered from convulsions, which continued up to the age of two months and was constantly under the care of Dr. W. In July 1893, Mrs. L. stated that the infant had no eruption before vaccination, and no nasal catarrh, nor snuffles until the winter afterwards. In September 1893 she stated that she had a stuffy nose and cold in the head after the fits.

Present state. There are four vaccination scars showing signs of some past inflammation, they are not pigmented. There is a general eruption on the body evidently due to parasites. There is no enlargement of the glands. On the thighs there are a considerable number of brown pigmented scars, which are said by the mother and by the doctor (Mr. F.) to have resulted from chicken-pox five months ago. Complexion, clear and fresh. Head, well formed, no bossing. Nose, depressed (?). Corneæ, clear. Bones, no nodes or periosteal swelling, slight evidence of rickets; is knockneed. Abdominal viscera, not enlarged. General nutrition, fair.

Family history. *Mother.* A delicate woman, suffering from extreme poverty. The house and surroundings are dirty and miserable. Her previous history does not give ground for the belief that she has suffered from syphilis, though she has been liable to sore throats for many years, and ever since childhood has suffered from a rash which comes out as a rule each spring, affecting chiefly the face and back of the arms. It burns and itches, and entirely disappears each year. She has now factitious urticaria. There is no evidence that either mother or the other infant contracted syphilis from the child A. E. L.

Father. Not seen. He is in a club attended by Dr. W., who has seen him for rheumatism and colds, but believes he has never suffered from syphilis.

The second child A. is fairly well nourished. She was vaccinated in April 1893. About 14 days afterwards "small watery bladders" appeared on the body and head. The vaccination wounds were completely well in two months. There are now four healthy vaccination scars. Complexion, healthy. Skin, healthy, no rash. Voice, natural. Nose, a little flat at root. Has never had

snuffles. Bones, healthy. Abdominal viscera, no enlargement. General nutrition, good. No glandular enlargement.

There is no ground for concluding that either of Mrs. L.'s children have suffered from invaccinated syphilis, neither does the history, so far as it can be ascertained, give sufficient evidence to show that either of them were the subject of inherited taint.

Mr. Davidson alleges that three or perhaps four children were suffering from inherited syphilis when used as vaccinifers. We are of opinion that the father of the two B.s, Nos. 383 and 384, had suffered from syphilis, and he himself admits that he had suffered from venereal disease twice before marriage, but from the history it does not appear that up to the time that B. V. B. was used as vaccinifer he had shown any signs of inherited taint; and at the present time, the evidence as to the possibility of his having suffered from congenital syphilis rather depends upon the family history than on any symptoms which the child shows. His brother G. F. B. has had symptoms which are possibly due to inherited syphilis, but it is uncertain which, if any, children were vaccinated from him. We were unable to discover any ground for supposing that the child E. B. (No. 454) has suffered from syphilis either invaccinated or congenital.

In the case of the child A. E. L., No. 426, the evidence of syphilis is very slight and most unreliable; and the child's present condition may well be due to the poverty and dirt in which it has been reared. There is no ground for supposing that syphilis was invaccinated.

(C.)—Cases alleged by Mr. Davidson to have suffered from syphilis in consequence of vaccination.

A. C. (No. 406 in register).

9th July 1893.

Direct from arm of child.

Probably No. 391 (G. L. P.), in whom vaccination was normal. The child is now (June 1893) well and shows no signs of syphilis.

The precise number is uncertain, but probably Nos. 407, 408, 420, 422 and 427. Of these 407 could not be traced, and in all the others vaccination was normal.

Probably three, 449–451. One of these, No. 449, is alleged by Mr. Davidson to have suffered from invaccinated syphilis (see page 326). One, A. F., could not be traced, and one, No. 459, was normal, except that some (? 9) supernumerary vesicles formed round the points of inoculation.

Mrs. C. states that the arm was inflamed during the second week from shoulder to elbow, and continued so for three or four weeks. One scab remained adhered at the end of six weeks. She also states that some four or five weeks after vaccination an eruption of minute red spots formed on the child's lips and face, which seemed to fill with water and discharge, the discharge forming crusts, and that in the mouth there were raised red patches which ulcerated. The child, she also believes, had sore throat as it had considerable difficulty in swallowing. From the description of the case, it would seem probable that the sores about the mouth were either herpes or eczema, and that the ulcers in the mouth were due to stomatitis. During the course of vaccination the digestion was much upset. The child vomited frequently and passed copious liquid motions.

As a baby she had suffered severely from "thrush" with swelling of the tongue and lips, and, as the mother says, had a very bad mouth. She was entirely hand-fed. During the last two years she has had several attacks similar to that from which she suffered after vaccination, accompanied by herpes in the mouth, yellow and greenish offensive motions, and much fretfulness and irritability. These attacks are speedily cured by some simple treatment such as magnesia, and latterly Mrs. C. has not obtained any medical advice for them.

Nutrition, good. Complexion, clear. Head, natural. Nose, well formed. Corneæ, clear. Remains of herpes at left corner of the mouth. Bones, no tenderness, periosteal swellings, or nodes. Abdominal viscera, normal. Vaccination scars, normal except one, which shows signs of past ulceration. *Present state.*

Mother. A delicate, anæmic woman, who has suffered from domestic trouble of an aggravated kind. She was unable to nurse the child, and contracted no sore from her. *Family history.*

Father. Not seen, but said to be healthy.

The eldest child E. died on 1st May 1890. The cause of death as certified by Dr. M., being "atrophy." It is alleged by Mr. Davidson that this child died as the result of vaccination, but Dr. M., who attended it all through its illness, having heard the mother's statement, still adheres to the opinion that it died of diarrhœa, quite independent of vaccination. There is no suspicion that the child suffered from syphilis.

The second child, a boy aged six years, is healthy.

The youngest child, E., aged 15 months, appears to be, and is said by mother to be, strong and healthy; she has four teeth, and is rather rickety. The vaccination scars are a little irregular. In September, 1893, she had lichen urticatus for the first time. She had no such eruption after vaccination.

The child A. C. does not now present any symptom of acquired or congenital syphilis, and it is to be noted (*a*) that no chancre formed at the point of vaccination, the pocks being completely healed in six weeks. (*b.*) That the eruption which followed vaccination had the characteristics of one that is common in children who are suffering from gastro-intestinal derangement; and that it made its appearance at a date anterior to that which would probably have been the case had it been syphilitic. (*c.*) That A. C. did not communicate any disease to her mother or the other child. It may further be noted that the child was vaccinated from a healthy vaccinifer, and was the first case vaccinated at the station on the 9th July. *Summary.*

J. E. (No. 409 in register). *Case of.*

Direct arm to arm. *Source of lymph.*

Doubtful, but probably No. 395, in whom vaccination was normal. When seen in June 1893, it had some slight impetigo on the face. *Vaccinifer*

Probably one. No. 410, in whom vaccination was normal. *Co-vaccinee.*

Shortly after vaccination the arm began to inflame and according to the child's grandmother, the wounds discharged for some weeks. The axillary glands enlarged, but did not break down. During the second week a slight eruption broke out on its face and ears, from which there was a watery and purulent discharge. The grandmother further states that about two months after vaccination the child's eyes became sore, and a rash like scarlet-fever broke out over its body, lasting only two or three days (was this measles ?). *Course of vaccination and illness.*

The grandmother states that the child was never properly attended to. The father and mother are separated, and the mother went out to work, entirely neglecting it. It was under these circumstances that it was vaccinated. Three days after vaccination it vomited and had diarrhœa. It was then weaned and hand-fed. *Previous history.*

The child is now miserably dirty, ill-nourished, ill-kept, and puny. Although two years old it cannot walk, and the anterior fontanelle is open. It has a papular eruption on the face and some slight scarring at the right angle of the mouth. General nutrition, bad. Anæmic. Nose slightly flattened. Abdominal viscera, normal. Four vaccination scars fairly well marked. *Present state.*

J., aged 8, and G., aged 4, show no signs of congenital syphilis. *Family history.*

The father seems healthy.

The child's vaccination was abnormal, but the conditions under which it was living are sufficient to account for the undue amount of inflammation round the vesicles. There is no adequate ground for supposing that syphilis was inoculated at the time of vaccination. *Summary.*

Case of. W. W. (No. 424 in register).

Source of lymph. Direct from arm of B. V. B., No. 383.

Vaccinifer. Member of a probably syphilitic family (see page 322).

Co-vaccinees. Probably 11 (see page 322).

Sub-vaccinees. Doubtful.

Course of vaccination and illness. According to the mother vaccination pursued a normal course for the first fortnight, and she thought the arm was healing. It then began to inflame; the redness and swelling reached the hand, and the healing of the wounds, which were treated with cream, was delayed for quite three months. At the end of the second or beginning of the third week a general eruption like little glass beads appeared, they were about the size of a pin's head, and none of them as large as a split pea. They lasted for many weeks, coming out in fresh crops and causing so much irritation that the child scratched them till they bled. The child did not lose flesh, it had no diarrhœa and no great constitutional disturbance. The mother, who was suckling him, did not get any sore upon her nipple, and has had none since, and a younger child S., whom she has subsequently nursed, has shown no sign of having contracted syphilis from her or his brother, and when four months old was seen by us to be a healthy baby with four normal vaccination scars.

Previous history. Previous to vaccination, good.

Present state. Complexion, clear. Head, large. Bones, well marked beading of ribs with enlargement of epiphyses of the long bones. Abdominal viscera, nothing abnormal detected. General nutrition, fairly good. On the arm there are four scars, two of them signs of some excess of inflammation. They are not pigmented. On the trunk and extremities there is a minute papular and sericular rash; (lichen urticatus) discrete not coppery, evidently causing great irritation, and much scratched.

Family history. W. is the youngest but one of eight children, all of whom have been born at full time and in succession without miscarriages intervening.

Summary. The child's present condition gives no ground for believing that it is suffering from acquired syphilis. It has lichen urticatus, and is rickety. The fact that the vaccination wounds partially healed and then commenced to inflame again is suggestive of the inoculation of syphilis; but the phenomena which followed were all inflammatory, while the appearance of the eruption so soon after vaccination, and the fact that it was very irritating and left no cicatrices, afford good ground for the belief that it was not of syphilitic origin.

Case of. J. P. F. (No. 429 in register) aged two years and four months.

Source of lymph. Doubtful.

Vaccinifer. Possibly No. 395, in whom vaccination was normal.

Co-vaccinees. Doubtful.

Sub-vaccinees. No record.

Course of vaccination and illness. The arm is stated to have been inflamed on the fifth day, the redness subsequently extending from shoulder to elbow. Two vesicles coalesced, and it is said that the sores were six weeks in healing. After the arm was healed some eruption broke out behind the ears, which were sore, discharged a good deal, and were covered with scabs, subsequently a pimply rash broke out on the chest, which discharged; it was very irritating, and the child used to scratch it until it bled.

Previous history. Unimportant.

Present state. Nutrition, good. Complexion, clear. Head, natural. Nose, natural. Corneæ, clear. Glands, not enlarged. Bones, no periosteal thickening or nodes. Abdominal viscera, nothing abnormal detected. There is a small patch of eczema above the left mamma and one small spot behind the left ear. There are four cicatrices on the arm, two normal and two showing some sign of excess of inflammation.

Family history. Unimportant. J. is the eldest of three children. The baby aged nine months was seen in September 1893, and it was healthy, vaccination having been normal and there being three small scars.

Summary. There is no evidence that the child is or has been suffering from syphilis. Vaccination was followed by some excess of inflammation and by eczema which was present in July, but was well in September 1893.

Case of. F. M. D. (No. 440 in register).

Source of lymph. Probably direct from the arm of T. R. (393), in whom vaccination was normal.

Vaccinifer. A healthy child, showing no sign of syphilis.

Co-vaccinees. Exact number doubtful. The vaccinifer T. R., No. 393, was vaccinated twice, the first time on the 2nd July, the second time on the 9th July, as four vesicles had not formed. It is probable that eight children were vaccinated from him, Nos. 431 to 435, and Nos. 440, 444, and 445. In 431, 434, 435, and 445, vaccination was normal. No. 444, A. D., died of broncho-pneumonia after an axillary abscess (see page 330). No. 440 is the case under consideration. Nos. 432 and 433 were abnormal. No. 435 died of muco-enteritis on the 7th October 1891.

J. F., No. 432. The arm is said to have been inflamed during the second week from shoulder to elbow, and not to have been well for three months. There was no glandular enlargement and no eruption on the body. The wounds were treated with castor oil and buttermilk. There are now, June 1893, four scars, showing evidence of considerable ulceration. The child is well strong, and healthy, and shows no evidence of syphilis.

H. A., No. 433. The mother states that vaccination was followed by a considerable amount of bleeding, and that the arm was inflamed from shoulder to elbow by the eighth day, but she says that the vesicles were opened and No. 395 vaccinated from them. The arm subsequently inflamed and the scabs were injured by sticking to the pillow. The wounds were treated with cream and did not heal for six weeks. There was no swelling in the axilla and no eruption on the body. There are four scars at the point of vaccination, two showing some signs of past ulceration. The child is in good health without any symptom of syphilis.

Sub-vaccinees. None. Vesicles not opened.

Course of vaccination and illness. By the eighth day the arm is said to have been inflamed from shoulder to elbow. The vesicles were not opened. But the sores are said not to have been completely healed for two months. There was some discharge from the wounds during the second week, but no swelling in the axilla or of the arm. Two days after vaccination the child had a rash "like scarlet fever" all over her body and extremities. This lasted only for 48 hours and since then she has had no eruption of any kind.

Previous history. The child has always been feeble and she is now suffering from rickets, the anterior fontanelle not being yet closed although she is more than two years old.

Present state. Complexion, clear. Neither the head, nose, corneæ, or teeth show any signs of congenital syphilis. Bones; enlargement of epiphyses of long bones; no periosteal thickening or nodes. Abdominal viscera, nothing abnormal detected. There are four scars not showing signs of excessive inflammation, one is very slightly puckered.

Family history. Bad. F. is the third of four children, all the others are dead. The first was still-born. The second died when two months old. The youngest died when two days old.

Summary. The history of vaccination and the child's present condition give no evidence that it has suffered from syphilis in consequence of vaccination. She is suffering from rickets and is an unhealthy member of an unhealthy family.

Case of. N. G. S. (No. 449 in register).

Vaccination. 16th July 1892, when nine weeks old.

Source of lymph. Probably direct from arm of A. L. C. No. 406.

Vaccinifer. A delicate child but showing no evidence of congenital or acquired syphilis (see page 325).

Co-vaccinees. Doubtful, possibly two, Nos. 450 and 451. Vaccination in the case of No. 450 was normal. No. 451 could not be traced. See under A. L. C., No. 406 on page 325.

No record, but probably none.

The mother states that the child's arm became swollen the day after vaccination, and that a day or two later it was inflamed from the shoulder to elbow. Buttermilk cloths, and poultices were applied on the third and fourth day; the pocks which formed were large, and when the scabs came off, open sores were left. A few days after vaccination a "red flush" came out all over its body, and before the arm was healed, an eruption broke out over the face and behind the ears, which consisted of red pimples running into one another, discharging a great deal and forming scabs. There were also red blotches on the body, looking as if the child had been stung. The eruption caused great irritation, and *the child scratched itself very much*. Dr. B. informs me that the child was taken to him shortly (? a few days) after vaccination, and that he treated it for broncho-pneumonia, he also states that he saw the eruption, and considered it a simple eczema.

When seen in June 1893, the child was suffering from a general papular eruption with erythematous areolæ, which were evidently producing great irritation (lichen urticatus). She had the same eruption, though much less, in September 1893. Nutrition, good. Complexion, healthy and fresh both on June and September 1893. Nose, well formed, Corneæ, clear. Bones, no nodes or periosteal thickening. Abdominal viscera, nothing abnormal detected. No mucous tubercles in or round mouth or anus. At the points of vaccination there are four scars, three showing signs of some excess of inflammation. Neither the history of the vaccinifer, the course of vaccination, the subsequent development of symptoms, nor the child's present state, give ground for the supposition that the case is one of vaccinal syphilis.

A. F. (No. 451 in register).

16th July 1891.

A. L. C., No. 406.

A delicate child, with no evidence of syphilitic taint.

Note.—This child, A. F., had left in July 1893, and was not seen either by Mr. Davidson or ourselves. On the authority of the statements made by a relative of the child's, Mr. Davidson has included this case amongst those which he alleges to be vaccino-syphilis. All the information he could obtain was that "the child had a "frightful arm, and broke out badly everywhere, and was "a very long time of getting better."

F. J. (No. 453 in register).

16th July 1891.

Doubtful; possibly E. D., No. 420.

Doubtful; No. 420 is a healthy child, in whom vaccination was normal.

Doubtful; possibly one, No. 452, a healthy child, in whom vaccination was normal.

No record.

During the second week the arm is said to have inflamed down to the elbow. The wounds did not suppurate, but soon healed. After the wounds were completely healed, an eruption appeared on the face (and on no other part of the body) like little watery pocks, which discharged. The eruption is said to have lasted for some weeks.

At the point of vaccination there are four regular cicatrices, with some very slight puckering. Nutrition, good. Complexion, clear. Nose, well formed. Cornea, clear. Bones, no nodes, no periosteal thickening. Abdominal viscera, nothing abnormal detected.

Nothing of importance elicited.

Vaccination seems to have pursued a normal course, with some slight excess of inflammation. The eruption from which the child suffered appears to have been impetigo. There is no ground for the belief that the child is the subject of invaccinated syphilis.

H. L. (No. 455 in register). *Case of.*

16th July 1891. *Vaccination.*

Doubtful; perhaps No. 422, G. J. *Source of lymph.*

No. 422 is a healthy child, in whom vaccination was normal. *Vaccinifer.*

Doubtful; possibly 454 (see below under next case) and 456 (see next case). *Co-vaccinees.*

The arm is said to have been inflamed from shoulder to elbow by the eighth day, and not to have been well for three weeks. There was little discharge from the wounds, which were treated with castor oil and cream. The father states that about 14 days after vaccination sores broke out behind the ears, with some discharge, and that the child began to suffer from diarrhœa and "thrush," from which it did not recover for six months. During the continuance of the diarrhœa it had redness round the anus. *Course of vaccination and illness.*

The child is fairly nourished, but anæmic. There are four vaccination scars, all showing signs of excess of inflammation. Complexion, clear. Head, well shaped. Nose, well formed; no catarrh or ozæna. Cornea, clear. Bones, no nodes or periosteal thickening. Abdominal viscera, no enlargement detected. There is no eruption on the body of any kind. *Present state.*

Unimportant. *Family history.*

Vaccination was followed by some excess of inflammation, eczema behind ears, and gastro-intestinal disturbance, but there is no evidence that syphilis was invaccinated. *Summary.*

E. J. S. (No. 456 in register). *Case of.*

[This case is referred to by Mr. Davidson in evidence before the Commission in his answers to Questions 23,106–26.]

Uncertain. In the register it is stated to be No. 419 (A. E. D.), but Mrs. D. states positively that no lymph was taken from her child's arm, and that the vesicles were not opened. From inquiries made by Dr. W., Mr. Davidson and Dr. Acland, it appears probable that the child was vaccinated from G. J., No. 422. *Source of lymph.*

No. 422 was vaccinated from No. 391. (G. P.). In both these cases vaccination was normal and without complication, and neither of the children show any evidence of syphilis. The vaccination of the child A. E. D. was also normal, and she shows no evidence of syphilis. *Vaccinifer?*

Uncertain, but probably two; viz., Nos. 454 and 455. *Co-vaccinees.*

No. 454. Vaccination normal. There was some impetigo of face a few weeks after the arm was well. (For full particulars of this case, which Mr. Davidson believes to be the subject of congenital syphilis, see page 324.)

No. 455. Some excess of inflammation during the second week. The child was suffering from eczema behind its ears. When seen (June 1893) it showed no sign of syphilis. (For details of this case see above.)

The history of these two cases does not give any ground for believing that either of them suffered from syphilis as the result of vaccination.

Mrs. S. says that the child's arm was much inflamed by the fourth day; the vesicles were then opened but no lymph was used or stored. The inflammation during the second week extended from shoulder to elbow; the glands in the axilla became much enlarged, but did not suppurate, and no abscess formed in the vicinity of the wounds. The vesicles discharged a considerable amount of offensive pus, and are said to have continued to suppurate for some weeks, and according to Mrs. S.'s statement, the wounds were not completely healed for three months. They were all equally affected, and when once healed did not break down again. After the vaccination wounds had healed, the child remained in good health for about six months, during this period it had no eruption on the body of any kind. About April 1892 a vesicular eruption appeared, which was seen by Dr. B., and was believed by him to be chicken-pox. This belief is supported by the fact that the child's brother F. suffered from the same rash two or three days before his sister's became affected. It is stated by the mother that in the case of E., the rash continued to come out for six weeks, but both Dr. B. and Dr. M., say this is not correct, they say it ran an ordinary course. Round many of the vesicles, there was a small dusky areola, and *Course of vaccination and illness.*

pigmentation persisted after the vesicles had dried up. The scars (September 1892), are not numerous, and are not symmetrical, they are about the size of half a lentil, they are pitted, and white in comparison with the dusky ring (about ⅛ in. broad) which surrounds them. The colour of this ring was (September 1892), distinctly brown and its appearance is remarkable. Mr. Davidson says the colour has changed very much and that originally it had the tint of a moderately bright penny. The scars are situated chiefly upon the abdomen, right leg, and back. On the trunk they are more numerous on the left side than on the right, and are in groups of two or three together. Only the large scars are surrounded by pigmentation, the smaller ones are white.

Present state. The child's present condition is excellent, she is said, and appears, to be in good health. Nutrition, good. Complexion, clear and fair. Hair, light brown. Head, well formed. Nose, well formed. Corneæ, clear. Bones, no periosteal thickening or nodes. Abdominal viscera, healthy. In September 1892 there were four large, soft, raised, dusky, but not pigmented scars, without any induration round or below them. In September 1893 the scars were slightly keloid in character. At neither time was there any enlargement of the glands in the neck or axilla.

Family history. No facts of importance elicited. There is one other child aged 5 who appears to be in good health. Its vaccination scars are small but otherwise normal. She did not suffer so severely as E. from varicella which has left no scars or pigmentation.

Summary. The child E. J. S. suffered from ulceration of the vaccination vesicles. The rash which followed six months after vaccination was probably chicken-pox, as at the time it was believed to be. The pigmentation which still remains round the scars may have been caused by the severity of the inflammation round varicella pocks as is sometimes the case; and that the inflammation was unusually severe is shown by the extent and persistence of the scars. It is worthy of note that the sites of vaccination are not, and have not at any time been, pigmented. Under these circumstances it seems to be an assumption without adequate support, to connect the pigmentation round the varicella vesicles with the previous vaccination—and a still further assumption to suppose that, because pigmentation appeared round the varicella vesicles nine months after vaccination, that, therefore, syphilis had been invaccinated. The facts of the case, as far as we have been able to elicit them, do not appear to justify either conclusion. It might possibly be suggested that the case was not one of varicella, but that really the eruption was a secondary vesicular syphilide (varicelle syphilitique, Chambord), such a view is negatived by the fact that the child's brother undoubtedly suffered from varicella at the same time, and that the eruption was recognised by three competent doctors. In September 1893, twelve months after the first inspection, the scars were still surrounded with pigmentation, the vaccination scars were not pigmented, and the child had a healthy appearance, while no manifestations of syphilis had shown themselves.

Case of. F. R. (No. 458 in register).

Vaccination. 16th July 1891.

Source of lymph. Direct from arm of A. E. L., No. 426.

Vaccinifer. See page 324.

Co-vaccinees. Probably two, No. 459 (see page 328), and No. 457, E. C., in whom vaccination was normal. The latter child when seen June 1893, was well nourished, with a clear skin, and no evidence of syphilis either inherited or inoculated.

Sub-vaccinees. None. Vesicles opened, but no lymph used.

Course of vaccination and illness. Mrs. R. states that the arm was inflamed, and the child had a fit 2½ days after vaccination. The pocks were then treated with cold bread poultices, and subsequently with castor oil on rags, and cream. The inflammation is said to have continued "on and off for some weeks," the axillary glands enlarged, but did not suppurate. "Long "before the arm got well," probably during the first week, a rash broke out all over the body, consisting of "little red "pimples with white tops." It caused great irritation and was much scratched. The eruption has returned several times since, and generally commences as "little "raised pimples about the size of a pin's head."

Present state. The child is now suffering, June 1893, from lichen urticatus, and the mother says that the eruption is just the same as that which it had after vaccination. It is causing great irritation. There is no pigmentation. The vaccination scars are large, and show signs of slight excess of inflammation. Nutrition, very fair. Complexion, clear. Nose, well formed. Abdominal viscera, no enlargement detected. No enlargement of glands.

Family history. Bad. Mrs. R. has had eleven children born at full time (F. is the 10th), seven of whom have died. The first five died in succession.

The eldest aged three weeks.
The 2nd aged eight weeks.
The 3rd aged 12 weeks.
The 4th aged 11 weeks.
The 5th aged eight months.
The 7th aged five years.

Mr. R. denied having contracted syphilis, and both he and Mrs. R. showed no evidence of it. The eldest living child, M., aged nine seems healthy. She was born at full time, had no rash, no snuffles, teeth good, nose good, no periosteal swelling, corneæ clear. The 2nd child, D., aged five, is a full-time child, he has had no rash, no snuffles as an infant. In neither of these two children is there any evidence of congenital syphilis. The youngest, M., aged 10 months, has a clear skin and looks healthy, and shows no cicatrices at mouth or anus, no enlargement of abdominal viscera. She has four healthy vaccination scars.

Summary. The child R. suffered from some excess of inflammation round the vaccination pocks, and lichen urticatus, but neither the history of the vaccination or his present condition, warrant the conclusion that he is the subject of invaccinated syphilis.

Case of. E. J. (No. 459 in register).

Vaccination. 16th July 1891.

Source of lymph. No record, but stated by Mr. Davidson to be from A. E. L., No. 426 (see page 324).

Co-vaccinees. No record, but if the above is correct, two, Nos. 457 and 458 (see page 328).

Sub-vaccinees. No record.

Course of vaccination and illness. The mother states that on the 8th day the arm was doing well, one of the scabs was then knocked off, and the wound was dressed with buttermilk, which was kept exposed in a saucer in the living room. During the second week the arm became much inflamed, the glands in the axilla swelled, and a pustular eruption formed on the forearm. This eruption came out in crops healing in one place, and breaking out in another. The mother states that they were not quite healed for some (12) months.

Present state. At the point of vaccination there are four large slightly raised scars, and one supernumerary one. Skin, clear. Nutrition, good. Corneæ, clear. Abdominal viscera, nothing abnormal detected.

Family history. The mother suckled the child and was not infected, she has had four children at full time, of whom E. is the youngest. Two other children were seen, they were both healthy.

Surroundings. The child and its surroundings are filthy.

Summary. There is nothing in the history of the case nor in the child's present condition to suggest that it is the subject of invaccinated syphilis. The method of treatment adopted and the child's filthy surroundings seem to be sufficient cause for the abnormal course of vaccination.

Case of. A. J. L. C. (No. 467 in register).

Vaccination. 23rd July 1891.

Source of lymph. Doubtful.

Co-vaccinees. No record.

Sub-vaccinees. No record.

Course of vaccination and illness. During the second week the arm was inflamed from neck to elbow. The pocks were poulticed and cream was applied, and the mother states that the vesicles formed were "as large as pennies" and discharged freely inoculating the arm below the wounds, and remaining open for some months. She further states that little lumps formed

on trunks, legs and nates, which suppurated and discharged and caused much irritation. No swelling formed in the axilla. When the arm was most inflamed the child had diarrhœa.

Nutrition, good. Skin, clear. Corneæ, clear. Bones, no periosteal thickening or nodes. Abdominal viscera, healthy. Body free from eruption. There are four vaccination scars showing evidence of considerable past ulceration. There is no sign of syphilis.

Mother has had seven children, A. is the youngest; one only is dead.

The child suffered from vaccinal ulceration accompanied by a pustular eruption but neither the present condition nor the history of the case give ground for the belief that syphilis was invaccinated.

M. M. (No. 469 in register).

23rd July 1891.

Doubtful. No record.

Doubtful. No record.

Doubtful. No record.

Vaccination according to the mother's statement pursued a normal course. The wounds were rubbed with the finger dipped in castor oil and they healed in about a month. A large axillary abscess subsequently formed and was opened by Dr. W., and later (about three months after vaccination), two abscesses formed on the legs, which were opened by Dr. M.; others also formed and discharged after being poulticed; these abscesses were not all healed for six months.

There are four vaccination scars showing signs of some slight past inflammation. There is a cicatrix in the left axilla and an enlarged gland can be felt. There are numerous (12–20) scars on various parts of trunk and limbs such as might have been caused by small abscesses. The child looks delicate. Nutrition, very fair. Skin, clear. Nose well formed. Corneæ, clear. Bones, no modes or periosteal thickening. Abdominal viscera, normal. A little irritable lichen on the trunk.

Mother has had eight children, all of whom are living.

The child suffered from axillary and other abscesses, probably the result of septic absorption from the vaccination wounds. There is no evidence either from the present condition, or the past history that syphilis was invaccinated.

L. H. (No. 484 in register).

30th July 1891.

Doubtful. No record.

No record.

No record.

The same week that the child was vaccinated it was taken away from home by its parents (who attend fairs) and lived with them in the common rooms of a public house. The arm inflamed to the top of the shoulder but not as far as the elbow and was treated by the application of muslin soaked in buttermilk. The muslin was removed two or three times a day—it often stuck to the scabs. There was little discharge from the pocks and no swelling in the axilla. Before the pocks healed a measley rash broke out behind the ears and on the forehead, there was no discharge and no scabs formed. About the same time the eyes became bloodshot and there was some purulent discharge from them.

On the 23rd June 1893. Nutrition, fairly good. Skin, no eruption except old fleabites. Corneæ, clear. Well-marked granular lids with slight purulent discharge. No iritis. Bones, well-marked. Enlargement of epiphyses of long bones with beading of ribs. Abdomen prominent. Liver and spleen, not enlarged. The child is liable to diarrhœa. No mucous tubercles. Cervical glands slightly enlarged. Vaccination scars, four normal. One supernumerary.

Unimportant. Mother has had three children. She only suckled the eldest, the second died "wasted."

Summary. The child shows well-marked signs of rickets, but none of syphilis.

General summary: (C.) In none of the cases alleged by Mr. Davidson to be suffering from syphilis in consequence of vaccination in July 1891 does the present condition (September 1893) seem to us to give adequate ground for believing that the child is now suffering from syphilis either congenital or acquired, and in none of them does the history of the case so far as we have been able to ascertain it, give any substantial support to such an hypothesis. This is the more noteworthy as none of the cases have been treated on the supposition that the symptoms following vaccination were of syphilitic origin; and though many of these have been under observation for a considerable period (more than 12 months) none have developed any of the manifestations of syphilis. In two cases only has there been any change at the seat of inoculation suggestive of the formation of a primary syphilitic sore. In the one, J. S. (No. 411), the pocks are said "nearly to have healed and then to have "festered up again," but the child has not suffered from any secondary syphilitic lesion. In the other W. W. (No. 424) the arm inflamed during the 3rd week and the wounds were long in healing, but the eruption (lichen urticatus) from which the child suffered came out during the first three weeks, was very irritating, and has returned several times since. This child shows signs of rickets but none of syphilis.

Finally, while we are of opinion that the conclusions drawn by Mr. Davidson are not justified by the facts, we wish to acknowledge our indebtedness both to him and to Dr. W., for the ungrudging way in which they have given their assistance in making this prolonged inquiry.

THOMAS BARLOW, M.D.
THEODORE DYKE ACLAND, M.D.

(3.) *Appendix by Dr. Acland.*

Appendix. [T. D. A.] In addition to the cases mentioned in the foregoing report, 36 others appear in the register as having been vaccinated during July 1891 at the public station. These cases are not included in the main body of the report since with one exception (No. 444 in register) it is not shown that they were vaccinifers or co- or sub-vaccinees of any of the alleged cases of syphilis.

Of these 36 cases, one, E. H. (No. 438 in register), suffered from some excess of inflammation. One, A. D., No. 444, is alleged to have died directly in consequence of vaccination, and is believed to have been a sub-vaccinee of T. E. R., No. 393 (*see under F. M. D., No. 440, at page 326 of this report*), but it has been thought better to report this case separately. Four; Nos. 428, 439, 447 and 480 in register, could not be traced. The remaining 30 were normal. (It should be pointed out that eleven of these cases were vaccinated by other practitioners than Dr. W. or his deputy, but with lymph supplied from the public station, of the source of which, however, no record has been kept.

The details of the two abnormal cases are as follows:—

E. H. (No. 438 in register).

Vaccination. Unsuccessful on the first occasion, 2nd July 1891. Successful on 9th July 1891.

Source of lymph. Direct from the arm of No. 437, a healthy child in whom vaccination was normal.

Course of vaccination and illness. The grandmother says that the arm was inflamed during the second week, and was not well for a month. There was no other complication.

Treatment of vesicles. The vesicles were treated with buttermilk and cream which was applied to the outside of a piece of rag. The rag was laid on the arm and kept on the wound without removal or cleansing for three weeks.

Previous history. The child is said to have been a "poor little thing" when born and when vaccinated.

Family history. Unimportant.

Present condition. Good. The child when seen, June 1893, was quite well.

Summary. Vaccination was followed by some slight excess of inflammation. Considering the method of treatment adopted it is remarkable that so little injury resulted.

Case of

Vaccination. A. D. (No. 444 in register).

Death. 9th July 1891 in four places by Public Vaccinator.

Certified cause. 23rd August 1891.

Certified by. "Broncho-pneumonia."

Source of lymph. Dr. W.

Vaccinifer. Direct from arm of a child.

Probably T. E. R., No. 393, who is healthy and in whom vaccination was normal.

Course of vaccination and illness. The statements made by the child's father, mother, and grandmother are in many instances conflicting, but they are in general agreement that there was considerable inflammation of the vaccinated arm which subsided, that the wounds were quite healed in about a month, and that after they were healed an abscess was noticed in the axilla. During this time the child was attended by Dr. L., and on Dr. W.'s first visit, as he informs me, nothing was said about the axillary abscess, while the vaccinated arm was well. Inasmuch as the child was breathing very badly when Dr. W. first saw it, he concluded that it had broncho-pneumonia and treated it accordingly, and he assures me that he was quite unaware that the child suffered from an axillary abscess after vaccination, so that he signed the certificate in accordance with the facts as he knew them.

Treatment of vesicles. During the second week the arm was poulticed and the pocks were treated afterwards with buttermilk and cream.

Previous history. The child had phimosis, and when two months old was circumcised. The operation wound was well before the child was vaccinated.

General surroundings. Fairly satisfactory.

Summary. The child was vaccinated shortly after circumcision had been performed. After vaccination it suffered from an axillary abscess. It is probable that the method of treatment adopted caused irritation of the pocks, and possibly precipitated the formation of the abscess. From the history it appears that the child was weakened by the vaccination and subsequently by the abscess, and finally succumbed to broncho-pneumonia. There is no evidence to show whether the affection of the lungs was of septic or catarrhal origin, but which ever was the case the history leaves little room for doubt that the axillary abscess which was secondary to vaccination was mainly the cause of the child's death.

Summary. General summary of the cases appearing in the register of public vaccinations at —— during July 1891.

Total cases in register (Nos. 381–499)	119
Deduct two cases entered twice (No. 441 same as No. 393, No. 430 same as No. 400)	2
Deduct 11 cases not vaccinated by the Public Vaccinator or at station	11
Leaving	106
Of these 106—	
Ten have died since July 1891	10
Twelve could not be traced (including the two cases which were entered twice in the register)	12
Two were traced but were not seen	2
Remainder inspected	82
	106

The total number of cases traced was 94, in 69 of whom vaccination was normal. In 20, vaccination was followed by some eruption or other sequelæ; the remaining four cases though not entirely normal being ultimately satisfactory.

Of the above cases, three, viz. :—Nos. 383, 384, and 454 in the register are alleged by Mr. Davidson to have been suffering from congenital syphilis when used as vaccinifers; one, No. 426, to have suffered from syphilis, either congenital or invaccinated; fifteen, Nos. 406, 409, 424, 429, 440, 449, 451, 453, 455, 456, 458, 459, 467, 469, and 484, to have suffered from syphilis in consequence of vaccination; and one, No. 444, to have died directly in consequence of vaccination.

A table is appended giving the names of all the children vaccinated at the public station at ——, during July 1891, and showing the source of lymph, &c., as far as can be ascertained. The particulars of the cases which appear in the joint report of Dr. Barlow and myself are printed in italics.

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No. in Register.	Name.	Date of Vaccination.	Source of Lymph.	Vaccinifer.	Mr. Davidson's Statement of Case; or, if the Child be dead, the certified cause of Death.	Remarks on Case.	Result of Vaccination.
		1891.					
381	J. S.	July 2	Calf	Warlomont's calf lymph.	-	-	Normal.
382	E. C. O.	„	„		-	Three insertions, one vesicle, re-vaccinated on eighth day with own lymph.	„
383	B. V. B.	„	„		Congenital syphilis, keratitis, iritis, node on jaw, "breaking out" before arm healed.	Corneal ulcers; no iritis; no node; no eruption. Father had suffered from syphilis.	„
384	F. H. B.	„	„		Congenital syphilis	Urticaria; Lichen; Coriza. Projecting forehead; no eruption after vaccination. Father had suffered from syphilis.	„
385	W. S.	„	„		-	-	„
386	O. W.	„	„		Excessive inflammation during second week.	Cream applied with feather	Ultimately satisfactory.
387	J. T.	„	„		Illegitimate child. Not found	-	Not known.
388	B. C.	„	„		-	-	Normal.
389	J. P.	„	„		Died September 15, 1892, aged 20 months, of "dentition" convulsions."	Eruption 14 days after vaccination, probably eczema. Death unconnected with vaccination.	„
390	M. D.	„	„		Has left ——	Not found	Not known.
391	G. P.	„	„		-	-	Normal.
392	M. E. B.	„	„		-	-	„
393	T. R.	„	„		-	Same case as 441	„
394	H. H.	„	„		Died December 23, 1891, aged 8 months, "Peritonitis."	Some excess of inflammation. Arm well "long before" fatal illness.	„
395	H. W.	„	„		-	Impetigo of face (June 1892)	„
396		„	„		Died November 28, 1891, aged 8 months. "Convulsions during dentition."	Entirely recovered from vaccination before fatal illness.	„

No. in Register.	Name.	Date of Vaccination.	Source of Lymph.	Vaccinifer.	Mr. Davidson's Statement of Case; or, if the Child be dead, the certified cause of Death.	Remarks on Case.	Result of Vaccination.
		1891.					
397	G. W.	July 2	Calf			Slight excess of inflammation	Normal.
398	P. R.	"	"			" "	"
399	F. O.	"	"			Feeble child. Excess of inflammation, some suppuration, vesicles treated with cream and Indian circate.	Unsatisfactory.
400	A. P.	"	"		Not seen, left town	Vaccination unsuccessful, re-vaccinated July 9th. (Same case as 439.)	Not known.
401	L. A.	"	"			Vaccination unsuccessful, re-vaccinated July 9th.	Normal.
402	F. G.	"	"				"
403	R. E.	"	"				"
404	W. B. H.	"	"				"
405	W. J. H.	"	"				"
406	A. L. C.	July 9	Human	391	Invaccinated syphilis	Arm inflamed second week, vesicular eruption fourth and fifth week; vesicles treated with poultices and cream. No evidence of syphilis.	Unsatisfactory.
407	W. K.	"	"	391	Not traced		Not known.
408	J. C. H.	"	"	391?		Miserable child. Eczema before and two to three months after vaccination.	Normal.
409	J. E.	"	"	395	Invaccinated syphilis	Child neglected by mother. Gastro-intest. cat. three days after vaccination, rash, probably eczema in second week and later. No evidence of syphilis.	Unsatisfactory.
410	A. M. M.	"	"	395			Normal.
411	J. S.	"	"	383		Course of vaccination irregular, but no eruption, and no evidence of syphilis. Vesicles treated with buttermilk, cream, and ointment.	Unsatisfactory.
412	T. W. C.	"	?	383	Died February 11th, 1892, aged 11 months. "Tubercular disease."		Ultimately satisfactory.
413	J. P.	"	"	383		Excess of inflammation, no eruption; information meagre.	Satisfactory.
414	J. H. T.	"	"	383		Three normal scars, one showing slight inflammation.	Normal.
415	E. H.	"	"	383		Gone to ——, not traced	Not known.
416	A. S.	"	? P. M. D.	393		Four normal scars, no sign of syphilis.	Normal.
417	J. W.	"	"	393		Four scars, one showing slight and one moderate inflammation.	"
418	M. P. B.	"	"	383		Four normal scars; no sign of syphilis.	"
419	A. E. D.	"	"	383		" " "	"
420	E. D.	"	"	391		" " "	"
421	T. E. R.	"	? P. M. D.	383	Died September 16, 1891, aged 7 months. "Diarrhœa, five days; exhaustion."	No excess of inflammation; no eruption.	"
422	G. J.	"	"	391		Four scars, rather irregular, otherwise normal.	"
423	S. S.	"	"	383		Four scars, rather faint; some inflammation.	"
424	W. E. W.	"	"	383	Invaccinated syphilis	Course of vaccination irregular; arm dressed with cream. Vesicular eruption second to third week. No evidence of syphilis now (June 1892).	Unsatisfactory.
425	A. E. H.	"	"	383		Three scars, two showing slight inflammation. No eruption.	Normal.
426	A. E. L.	"	"	383	Either inherited or acquired syphilis.	Excess of inflammation during second week, and irritating eruption. No present evidence of syphilis.	Unsatisfactory.
427	G. B.	"	Human	391		Four scars, three showing signs of inflammation.	Normal.
428	G. M.	"	"		Gone to ——		Not known.
429	J. P. P.	"	"	385? 395?	Invaccinated syphilis	Some excess of inflammation; no application to arm; no evidence of syphilis.	Unsatisfactory.
430	A. P. (400)	"	"			Re-vaccination	Same as No. 400.
431	J. N. W.	"	"	393		Some inflammation, two normal scars; no eruption.	Normal.
432	J. F.	"	"	393		Excessive inflammation, some ulceration; castor oil and buttermilk applied to arm.	Unsatisfactory.
433	H. A.	"	"	393		Some inflammation during first week, scabs injured, slight ulceration.	"
434	F. S.	"	"	393		Vaccination normal; eczema behind ears.	Normal.
435	M. E. P.	"	"	393	Died October 7, 1891, aged 6 months. "Muco-enteritis, 2 weeks."		"
436	L. B.	"	"	437			"
437	J. B.	"	"	Self	A re-vaccination; vaccinated first on July 2nd.	Slight inflammation; no eruption	"
438	E. H.	"	"	437		Puny child, arm treated with buttermilk and cream; same rag kept on wounds for two weeks.	Unsatisfactory.
439	F. L.	"	"	437	Not found		Not known.
440	P. M. D.	"	"	393	Invaccinated syphilis (P. M. D.).	Arm inflamed second day; erythematous eruption first week; vesicles treated with olive oil; no evidence of syphilis.	Unsatisfactory.
441	T. R.	"	"	Self	Re-vaccinated. Same as 393.		Same as 393.
442	E. C.	"	"	381			Normal.

No. in Register.	Name.	Date of Vaccination.	Source of Lymph.	Vaccinifer.	Mr. Davidson's Statement of Case; or, if the Child be dead, the certified cause of Death.	Remarks on Case.	Result of Vaccination.
		1891.					
443	T. B.	July 9	Human	381	- - - - -	- - - - - -	Normal.
444	*A. D.*	„	„	393	*Died August 22, 1891, aged 5 months. "Broncho-pneumonia."*	*Axillary abscess; broncho-pneumonia; arm treated with buttermilk and cream.*	*Unsatisfactory.*
445	*B. C.*	„	„	393	- - - - -	*Four normal scars* - - -	*Normal.*
446	A. C.	„	„	397	- - - - -	„ „ - - -	„
447	H. J.	„	„	397?	- - - - -	Could not be traced - - -	Not known.
448	E. L. C.	„	„	397?	- - - - -	Four small superficial scars - -	Normal.
449	*N. G. S.*	*July 16*	„	*406?*	*Inoculated syphilis* -	*Inflammation first week; ulceration, erythema during first week, rather irritating eruption like stings. Seen by Dr. B. for eczema. No evidence of syphilis.*	*Unsatisfactory.*
450	*J. T.*	„	„	?	- - - - -	*Supernumerary vesicles* - -	*Normal.*
451	*A. F.*	„	„	??	*Inoculated syphilis* -	*Not traced* - - - -	*Not known.*
452	S. M.	„	„	420	- - - - -	Arm inflamed eighth day, four large scars.	Normal.
453	*F. J.*	„	„	?420	*Inoculated syphilis* -	*Impetigo of face after arm was well; no evidence of syphilis.*	„
454	*E. B.*	„	„	420?	*Congenital syphilis* -	*Impetigo, face and head after arm healed; no evidence of syphilis.*	„
455	*H. L.*	„	„	?	*Inoculated syphilis* -	*Arm inflamed first week, treated with castor oil and cream. No sign of syphilis.*	*Unsatisfactory.*
456	*E. J. S.*	„	„	?	„ „ -	*Vaccinal ulceration followed five months after by varicella. No evidence of syphilis.*	„
457	*E. C.*	„	„	426	- - - - -	*Four scars slightly puckered* - -	*Normal.*
458	*F. R.*	„	„	426	*Inoculated syphilis* -	*Arm inflamed third day after vaccination. Some weeks after general papular eruption very irritating, which has returned several times. No adequate evidence of syphilis.*	*Unsatisfactory.*
459	*E. J.*	„	„	426 *P. M. D.*	„ „ -	*Scab knocked off; eighth day arm treated with buttermilk; axillary swelling; pustular eruption on arm, second week. No evidence of syphilis.*	„
460	F. J.	„	„	406	- - - - -	Three irregular scars, some excess of inflammation; arm poulticed and cream applied.	? Ultimately satisfactory.
461	H. A. T.	„	„	413	Died March 13, 1892, aged 13 months. "Suddenly of "convulsions."	- - - - - -	Normal.
462	V. F.	„	„	?	- - - - -	- - - - - -	„
463	E. K.	„	„	?	Died December 20, 1891, aged 10 months. "Tuberculosis."	- - - - - -	„
464	S. S.	„	„	?	- - - - -	- - - - - -	„
465	D. G.	„	„	421?	- - - - -	- - - - - -	„
466	A. L.	July 23	„	?	- - - - -	- - - - - -	„
467	*A. C.*	„	„	?	*Inoculated syphilis* -	*Eruption on body four weeks after vaccination, very irritating, much discharge. Eczema. Arm treated with poultices and cream; ulceration of vesicles. No evidence of syphilis.*	*Unsatisfactory.*
468	E. B.	„	„	?	- - - - -	- - - - - -	Normal.
469	*M. M.*	„	„	?	*Inoculated syphilis* -	*Axillary abscess; abscesses on legs and trunk; vesicles rubbed with castor oil on finger; case probably septic. No evidence of syphilis.*	*Unsatisfactory.*
470	A. W.	„	„	?	- - - - -	- - - - - -	Normal.
471	E. B. G.	July 30	„	468	- - - - -	- - - - - -	„
472	M. H.	„	„	? 461	- - - - -	- - - - - -	„
473	A. J.	„	„	? 461	Moved to —— -	Vaccination said by mother of 472 to have been normal.	
474	W. G.	„	„	?	- - - - -	- - - - - -	„
475	E. M. H.	„	„	461	- - - - -	- - - - - -	„
476	M. P.	„	„		- - - - -	- - - - - -	„
477	W. R. A.	„	„		- - - - -	Some excess of inflammation - -	„
478	S. A. W.	„	„		- - - - -	Not vaccinated at station - -	„
479	E. B. T.	„	„		- - - - -	Has left ——. A private case -	„
480	D.	„	„		- - - - -	Not traced - - - -	Not known.
481	R. J.	„	„		- - - - -	- - - - - -	Normal.
482	R. E. B.	„	„		Died October 19, 1892, aged 18 months. "Broncho pneumonia."	- - - - - -	„
483	M. M.	„	„		- - - - -	- - - - - -	„
484	*L. H.*	„	„		*Inoculated syphilis* -	*Some excess of inflammation, measly eruption behind ears and on forehead before arm healed; arm treated with buttermilk, muslin stuck to scabs, well-marked rickets. No evidence of syphilis.*	*Unsatisfactory.*
485	M. W.	„	„		- - - - -	- - - - - -	Normal.
486	H. B.	„	„		- - - - -	Gone to —— - - - -	Not known.
487	P. B.	„	„		Vaccinated by Dr. M. with lymph from P. V.	Not vaccinated at public station -	Normal
488	S. W.	„	„		„ „ -	„ „ „ -	„

No. in Register.	Name.	Date of Vaccination.	Source of Lymph.	Vaccinifer.	Mr. Davidson's Statement of Case; or, if the Child be dead, the certified cause of Death.	Remarks on Case.	Result of Vaccination.
		1891.					
489	W. J.	July 30	Human		Vaccinated by Dr. W.		Not known.
490	A. S.	"	"		Vaccinated by Mr. Davidson with lymph from P. V.	Not vaccinated at public station	Normal.
491	M. R.	"	"		" "	" " "	"
492	F. B.	"	"		" "	" " "	"
493	A. L.	"	"		" "	" " "	"
494	L. G.	"	"		" "	" " "	"
495	H. H.	"	"		" "	" " "	"
496	A. B.	"	"		" "	" " "	"
497	A. E.	"	"		" "	" " "	"
498	H. M.	"	"		" "	" " "	"
499	H. T.	"	"		Vaccinated by Dr. W., but not at station.	Marked areola	"

CASE 140 [SERIES], REPORTED TO THE COMMISSION BY MR. P. M. DAVIDSON.

Case of M. W. and others vaccinated at the public vaccination station at —— in July 1892: *report to the Commission of Dr. Theodore Dyke Acland.*

In addition to the cases which Mr. Davidson brought before the notice of the Commission in his evidence as being, in his opinion, cases of inoculated syphilis, or "suspicious cases" in which he could not say whether there was syphilis or not (*see Case* 139 [*Series*]), he subsequently desired to bring to the notice of the Commission 69 children suffering from what he believed to be "ulcerated and otherwise bad arms."

When 32 of these cases had been inspected, I found that 27 of them had been vaccinated in July 1892, and thought it desirable to request Dr. W., Public Vaccinator, to allow me to investigate the whole of the cases which were vaccinated by him in his capacity of Public Vaccinator during that month, in order that some conclusion might be arrived at, as to whether the number of children who presented abnormal symptoms was excessive.

With the assistance of Dr. W. all the children, except one, whose names appear in the vaccination register for the 7th, 14th, 21st, and 28th July 1892, were traced. They numbered in all 78. Of these I personally inspected 50. Of the remainder Mr. Davidson informed me that he had seen 25, Dr. W. inspected one, and one had died.

Mr. Davidson informed me that in the 25 cases he had inspected, vaccination was normal, and as it was Mr. Davidson who had made the statement that an unusual amount of inflammation had followed the vaccinations in July, it seemed to me unnecessary personally to inspect those cases which, according to him, had pursued a normal course. Only those cases were visited which he considered abnormal.

The cases were inspected on the 13th, 14th, and 15th September 1892.

In a letter dated the 21st September (1892) Mr. Davidson wrote of the cases which he had previously pronounced satisfactory, "that very few were right" in his opinion: he considered them to be abnormal, *i.e.*, "with slight "ulceration or very irregular cicatrices without ulceration;" and in another communication he writes:—

"Perhaps with regard to the cases you did not see and "marked as certified by me as satisfactory or normal, you "would make it clearly understood that, although some of "them were satisfactory, others had had some excess of inflammation, irregular cicatrices, and two running into "one, and I so certified as I thought it waste of your time "visiting them, seeing you did not consider these peculiarities alone constituted any deviation from normal."

Subsequently in March 1893, in his report as Medical Officer of Health, he stated:—

"That in the investigation of a single vaccination period" (viz., that under consideration July 1892.—T. D. A.) "and "this did not include all the cases, the fact was revealed "that in quite 50 per cent. of all (about 70) vaccinated in "that period the results were abnormal, and in a large "number of these grave injuries have been inflicted."

Source of lymph for July vaccinations.

In order to obtain lymph for his quarterly vaccinations Dr. W. is in the habit of obtaining calf lymph from "the "Association for the Supply of Pure Vaccine Lymph," and on this occasion, early in July, he obtained some vaccine pomade (Warlomont's) with which, on the 7th July 1892, 21 children were vaccinated. On the same day Nos. 11 and 17 were vaccinated from stored lymph, the source of which is not further specified.

On the 14th July 15 children were vaccinated from those who came up for inspection.

On the 21st July Dr. W.'s deputy vaccinated 25 children directly from arm to arm, but no record has been kept as to the source from which each was vaccinated.

On the 28th July the same deputy vaccinated 12 cases, the source of lymph not being recorded in any of them.

Note.—Dr. W. informs me that at the July vaccinations he gave the mother's boracic powder and lint with directions how to use it; he saw many cases with the lint sticking to the vesicles, and has since discontinued its use.

A brief record of these cases and the results are given below:—

(A.)—Cases vaccinated on 7th July 1892 by Mr. W. T. F., L.R.C.P. I.

Aged four months. Vaccination normal; four normal scars. Child miserably delicate, but no worse than before vaccination. (*c.*) *B.*

Note.—In this and in all the following cases by "normal" it is to be understood that the vesicles formed well without any ulceration or undue inflammation, that there was no enlargement nor suppuration of axillary glands, no general eruption nor other unusual sequelæ.

Aged four months. Vaccination normal up to eighth day. After this slight surrounding inflammation, but no other abnormal symptom. A shield was used. When inspected there were three healthy scars, two almost coalescing. Child well. (*z.*) *E. M.*

Aged five months. Vaccination normal; two small normal cicatrices. Child well. (*z.*) *B.*

Aged five months. Vaccination normal. (Inspected by Mr. Davidson.) (*z.*) *H.*

Vaccination normal. (Inspected by Mr. Davidson.) (*z.*) *H.*

The arm began to inflame about the third or fourth day, and by the eighth day, the mother informs me, the vesicles (*b.*) *M. W.*

were broken and discharging. The arm was then poulticed under medical advice, and deep ulcers formed at the points of inoculation. These discharged copiously an offensive pus, and were long in healing. The axillary glands were much enlarged; but did not suppurate; there was no general eruption on the body. When inspected, September 1892, the child was well. There were three irregular cicatrices running together, with considerable puckering of the skin; no induration of the base, but the edges were a little thickened, and the surface was smooth with a slight branny desquamation. The case was one of vaccinal ulceration, with considerable excess of inflammation. I was unable to detect anything which would lead me to suppose that it was a case of inoculated syphilis.

(7.) *L. C.* Aged four months. Vaccination normal; three rather irregular normal cicatrices. Child well.

(8.) *N. F.* Aged three months. Vaccination normal. Two small cicatrices. Child well.

(9.) *S.* Vaccination normal; two scars slightly depressed; two of the vesicles have coalesced; otherwise they are normal. Child well.

(10.) *L.* Aged 17 months. Vaccination normal. (Inspected by Mr. Davidson.)

(11.) *W.* Aged 15 months. Vaccination normal; from tube of stored lymph; source unknown.

(12.) *M. R.* Aged 14 months. At the beginning of the second week after vaccination there was considerable inflammation, which extended from the shoulder to below the elbow, the vesicles did not ulcerate, and there was no enlargement of axillary glands. The child did not at any time seem to be ill. Previous to vaccination the child suffered from some eruption which seems to have been eczema, this has now entirely disappeared. There are three cicatrices, two of which are small, but otherwise normal. The child is well.

(13.) *D.* Aged three months. Vaccination normal. (Inspected by Mr. Davidson.)

(14.) *W.* Aged five months. After the formation of the vesicles there was a well-marked areola, but otherwise vaccination pursued a normal course. There are now three rather irregular cicatrices. The child is well.

(15.) *B.* Aged 15 months. Vaccination normal. Three rather irregular but otherwise normal cicatrices.

(16.) *P.* Aged three months. Vaccination normal. (Inspected by Mr. Davidson.)

(17.) *E. G.* Aged five months. Died on the 16th July 1892, an inquest being held on the 29th. The verdict of the Coroner's jury was "that the deceased, E. G., was found dead in "bed; such death being probably due to convulsions, and "the jury are further of opinion that such death was due "to natural causes."

Source of lymph. A tube of lymph used: source unrecorded.

Co-vaccinees. No record.

Sub-vaccinees. No record.

Course of vaccination. As far as could be ascertained vaccination pursued a normal course, and there does not seem to have been anything unusual in the appearance of the pocks. I was unable to obtain any information from Mrs. G. other than that embodied in Mr. Davidson's statement, which is as follows:—

"The mother states that 'the child was vaccinated "'on July 7th, 1892. The arm was inflamed the whole "'of the day week following, and it tossed the arm about "'and was restless. On the afternoon of that day (3 "'o'clock) she took it to the Public Vaccinator to have "'the matter taken, which was done, and the arm in-"'flamed more that night, the child moving it about "'more than in the earlier part of the day and was more "'restless. Early the following morning it died in a fit. "'It had been in perfect health previous to being "'vaccinated, and had not been fed differently or treated "'other than it always was.' I" (*i.e.* Mr. Davidson) "know of nothing to cause the child to have fits but the "uneasy state of the arm. I cannot say that the arm "looked very bad, but it certainly made the child toss it "about and make it restless."

The inquest threw no light on the cause of child's death. No post-mortem examination was made; no medical evidence was called; and no adequate effort seems to have been made to ascertain the cause of death. The following depositions were made before the Coroner:—

Deposition of Witnesses severally taken and acknowledged on behalf of our Sovereign Lady the Queen, at ——, this 29th day of July 1892, before me H. C. Y., Esquire, one of the Coroners of our said Lady the Queen, of and for the said County of ——, upon an Inquisition then and there holden, on view of the body of E. G., then and there lying dead, as follows:—

H. G. — —, wife of N. G., fustian cutter, and lives at ——. The deceased was my daughter, was three months old, and has been healthy from birth, and no doctor has attended her. About a week ago the deceased was vaccinated, and on Thursday last I took it to Mr. W. to have the "matter" taken from her arm, who said it was going on very well. She was very fretful all Friday. About 10 o'clock p.m. I gave her some bread and milk, and then went to bed; was disturbed twice during the night by the child, and about 4.45 o'clock on Saturday (16th July) morning I observed it was stiff, it was not twitching, but its hands were closed. I sent my husband for a neighbour, but the child was dead.

H. D.—I am wife of W. D., and am a neighbour to last witness. About 5 o'clock a.m. on Saturday (16th July) I went to see deceased, who was quite dead; and had been some time. I saw her on Friday (15th July), she was well then.

J. B.—Sergeant of Police at ——. I saw the deceased about 5.15 o'clock on a Saturday (16th July), and examined the body, which was well-nourished; her hands were clenched, and the lower part of the left leg was discoloured.

Verdict.—That the deceased E. G. was found dead in bed, such death being probably due to convulsions; and the jury are further of opinion that such death was due to natural causes.

The evidence is so unsatisfactory that it does not warrant any conclusion as to the real cause of the child's death.

Vaccination normal. Two cicatrices, one slightly marked. Present condition satisfactory. (18.) *R.*

Aged 13 months. Vaccination normal. (19.) *F. J.*

Aged five months. Vaccination normal. The mother tells me that vaccination gave no trouble of any kind, and that the wound soon healed. There are three irregular cicatrices, reddish, but not indurated, and apparently only recently formed (September 1892). No rash on body, and no enlargement of glands. The child is well. (20.) *C. L.*

Aged two months. Vaccination normal. (Inspected by Mr. Davidson.) (21.) *H.*

Aged four months. The mother informs me that vaccination was followed with very little inflammation, and that the arm healed well and quickly; there was no enlargement of glands and no general eruption on body. There are now (about nine weeks after vaccination) three almost linear cicatrices not resembling vaccination scars, they are rather indurated and reddish. There is no enlargement of axillary glands, and no eruption on body. The child seems well. The scars appear to me to have resulted from inflammation and possibly suppuration, but I have been unable to obtain any information that such lesions had followed vaccination. (22.) *W. A. B.*

Aged five months. Vaccination normal up to the eighth day. On the day of inspection lymph was taken for the vaccination of two children, and next day the arm inflamed from below the elbow to above the shoulder and up the neck; and there was much offensive discharge from the vaccination wounds. The vesicles were treated with castor oil on linen rags; the arm is said to have continued inflamed for three weeks, and was not healed for eight weeks. There was no glandular enlargement; but during the first two or three weeks there was a measly rash all over body. The vaccination wounds healed well, and have not since broken down, and she child is now well. There are three irregular, rather scaly cicatrices with no induration, and there is one similar cicatrix below and on the outer side, which is said to be the result of inoculation of pus from the vesicles. There is now a slight papular rash on the neck, and a slight discharge from the left (23.) *C. C.*

external auditory meatus. The history which I was able to obtain of the date of the appearance of the abnormal symptoms in this case lead me to the conclusion that it was one of vaccinal ulceration, followed by vaccinal rash. All the symptoms had practically disappeared about the time at which it might have been expected that any symptoms due to inoculated syphilis would have first shown themselves, and the child has recovered without any mercurial treatment.

(B.)—Cases vaccinated on 14th July 1892.

,H. Aged seven months. Three insertions were made, and subsequently the arm became much inflamed. There are now two cicatrices only, one much larger than the other, the larger one being elongated with a thickened, indurated, and puckered cicatrix, which has the appearance of having resulted from inflammation. The vaccination was not followed by rash, induration of glands, or other complications. The child is well.

,N. Towards the end of the first week after vaccination the arm inflamed from shoulder to elbow, the vesicles were opened on the eighth day, but no children were vaccinated, and no lymph was stored from them. The wounds did not discharge much, but scabbed over; the scabs came off in three or four days, leaving a deep ulcer which was long in healing. During the first week a measly rash appeared on the body. The vesicles, as far as is known, were not injured. No treatment was adopted exactly under medical advice, and this consisted only of applications to the arm, and no remedies given under the supposition that the affection was syphilitic. There are now two scars, one larger than the other, the larger one depressed and rather red, but without induration; there is no enlargement of the glands, and the child apparently is in good health.

Note.— The above two cases, Nos. 24 and 25, were both vaccinated from C. C. (No. 23), whose vaccination pursued an abnormal course, the arm being inflamed from below the elbow to the back of the neck on the ninth day. The lesion in these three cases seems to have been inflammatory and not syphilitic.

Aged three months. Vaccination normal. (Inspected by Mr. Davidson.)

. Aged three months. Vaccination normal.

. Aged two months. Mr. Davidson informed me that there was some ulceration, and that two of the vesicles ran into one; but the grandmother, whom I saw, told me that she did not notice anything wrong with the arm; she said that it was quite well in three weeks, and that there was no rash and no enlargement of the glands. The child and its mother were away. I saw the child on the 20th April, 1893, it was then well, with three rather deep scars, two coalescing; both mother, grandmother, and aunt agree in stating that the vaccination had been without complication, and that the areola was subsiding when one of the scabs was knocked off. The wound remained sore for two or three weeks, but there was not at any time very much inflammation.

. Aged three months. Vaccination normal. (Inspected by Mr. Davidson.)

V. Aged five months. Vaccination normal. Three slightly irregular cicatrices. The child is well.

V. B. Aged seven months. Vaccination was performed twice; the first time unsuccessfully; the second time the arm inflamed during the second week from shoulder to elbow; there was no general eruption and no enlargement of glands. The points of inoculation appear to have been placed too near together. The three scars are reddish and a little irregular, and have run into one. There is no induration round them and no enlargement of axillary glands. The child is well.

,H.S. Aged 14 months. The vesicles were placed too near together, and the scars are now almost coalescing. There was not much inflammation. During the second week three patches of eruption appeared on the head, which are said to have been "just like vaccination." Nothing is now (September 1892) visible, except that the child has some very slight eczema. The scars are reddish and irregular.

V. M. Aged four months. Vaccination normal, with the exception that during the second week there was a large areola round the vesicles which soon subsided, and 14 days after vaccination a red papular eruption appeared on the arm and body, lasting for 14 days. There are now four irregular cicatrices varying in size. The child is well and shows no evidence of syphilis.

Aged three months. Vaccination normal. Inspected by Mr. Davidson. (74.) W.

Note.—Of the above nine cases, the last eight were vaccinated from B. (No. 15). No 26 was vaccinated from No. 13.

Aged three months. Vaccination normal. Inspected by Mr. Davidson. (86.) D.

Aged three months. Vaccination normal. There are now three irregular scars, which are reddish, but not indurated; there is no enlargement of glands, and no eruption on body. (86.) N. C.

About 15 days after vaccination swelling and redness commenced on the top of the shoulder, then faded, but began again at the elbow and on the forearm. During this time it does not seem, from the father's account, that the vaccination vesicles were themselves affected, although four days after inspection, that is, on July 25th, they had stuck to the nightgown. Three days after this the forearm became much more inflamed, swelled greatly; an abscess formed, which broke and discharged. In June the child's grandmother, Mrs. F., who lived in another house, was suffering from what was afterwards proved to be a large abscess in the abdominal wall. Dr. W. informs me that on the 10th July this abscess ruptured, and discharged a large quantity of offensive pus; pyæmia resulted, and she died on the 11th August 1892, the certified cause of death being "peritonitis, suppuration, exhaustion." (87.) S. R.

The child R. was on several occasions taken to see this woman, and it was after one of these visits to her that the swelling above the vaccination vesicles was first noticed. There is now (September 1892) a sinus in the forearm, surrounded by inflamed and thickened tissues, and discharging thin, unhealthy-looking pus. The child is suffering from the results of cellulitis of the forearm, but the seat of vaccination is not involved. There are now two small reddish scars, one large and less marked than the other.

Aged three months. The arm was slightly inflamed, and there was slight enlargement of the axillary glands, but the child was well in a month. Three insertions, too close. Two vesicles have coalesced, leaving two irregular scars. (88.) P.

Note. The above four cases were vaccinated from C. L. (No. 20), in whom vaccination was normal.

(C.)—Cases vaccinated on 21st July 1892.

Aged four months. Vaccination normal. There are now three slightly reddish cicatrices without induration. The child is well. (89.) J. J. B.

Aged eight months. Vaccination normal, with the exception that two of the vesicles have coalesced. There was no excess of inflammation, and the child is well. (90.) F.

Aged three months. Vaccination normal. Inspected by Mr. Davidson. (91.) R.

Aged three months. Seen by Mr. Davidson, who writes:— (92.) D.

"Vaccinated in four places, the arm was bad, and a long "time in healing; two marks have run into one, and a third "shows signs of ulceration and loss of substance."

Aged four months. Vaccination normal. There are now one elongated and two circular cicatrices, with rather smooth bases. There is no surrounding induration, and the child has had no rash or enlargement of glands. When seen again, on the 22nd June 1893 two of the scars are normal, one is small; the child is not strong. (93.) L. N.

Aged four months. Vaccination normal, until the eighth day, when a considerable areola formed round the vesicles without glandular enlargement or rash. The cicatrices are irregular. There has evidently been some inflammation, but there is now no induration nor enlargement of glands. The child is large, well nourished, and in good health. (95.) A. H.

Aged three months. Vaccination normal. There are three irregular cicatrices without induration. The child is well. (95.) C.

(46.) *G.* Vaccination normal? Inspected by Mr. Davidson. Mr. Davidson subsequently wrote (5th January 1893): "G. "was rather a serious case. Mother had to take it to "Dr. M. on account of the badness of the arm." On the 21st April 1893 this child had three irregular cicatrices, with some puckering, the centre being pink, raised and smooth, and giving evidence of there having been a considerable amount of inflammation. Mrs. G. states that the arm discharged for five weeks, she then took the child to Dr. M.; that he ordered poultices which she did not put on, and that pus collected under the scabs. The sleeve of chemise used to get soaked with blood and pus, and stuck to the wounds every night for a week.

(47.) *F. B.* Aged three months. The vesicles began to inflame on the ninth day, up to which time vaccination had pursued a normal course. The inflammation did not extend below the elbow, nor above the shoulder, and there was no enlargement of glands or secondary abscess. There was offensive discharge from the wounds, though they healed within six weeks of vaccination. There has been some papular and vesicular rash on body, which was probably eczema, of which there is still a good deal round the ears. There are two puckered cicatrices, the upper one consists of two vesicles which have coalesced, and there seems to have been a considerable loss of tissue. There is a little induration round the edges of these scars, which seems to be an inflammatory thickening of the edge, and not a general induration of the base. There is now no rash upon the body except the eczema, and no enlargement of the axillary glands. The child is well nourished, but pale. He seems well, except for the eczema, which causes a good deal of irritation. I was unable to ascertain that the vesicles had been injured, or that there was any other external cause for the inflammation which succeeded vaccination.

(48.) *G. D.* Aged four months. Vaccination seems to have pursued a more normal course than might have been expected from the child's present condition. The arm has not been much inflamed; there has been no abscess nor inflammation of the axillary glands, and no rash upon the body. At the point of vaccination there are three scars, at the lower part of which there is a considerable raw surface, evidently caused by the wounds being constantly irritated by the sleeve, which is stretched right across it, and which is saturated with accumulated discharges and dirt. The child is feeble, and is one of a family of nine, of whom only three are living, five having died under the age of nine months. I did not pursue the history in this case further, inasmuch as there is no record that any child was vaccinated from him, and the condition of the vaccination vesicles was obviously due to a preventable cause. Mr. Davidson dissents from this; on the 5th January, 1893, he writes, "You seem a little too severe on the treat- "ment of this case."

(49.) *D.* Aged three months. Child seen by Mr. Davidson, who reports (28th September) two very faint scars, free from ulceration. Vaccination normal.

(50.) *S.* Aged two months. Vaccination normal. Three normal scars, one having a very slightly thickened cicatrix. Child well. (June 22nd, 1893.)

(51.) *S.* Vaccination normal. There are three rather irregular cicatrices. The child is well.

(52.) *C.* Aged five months. Vaccination normal. Three smallish, fairly regular cicatrices. The child is well.

(53.) *T.* Aged nine months. Vaccination normal. Inspected by Mr. Davidson.

(54.) *F. W.* Aged 17 months. Vaccination normal. Three normal scars. The insertions have been made too close together.

(55.) *A. B.* Aged four months. Vaccination pursued a normal course until the vesicles were rubbed off during the second week. The scabs were subsequently knocked off twice, notwithstanding which the arm did not inflame, and there has not been much discharge from the wound. There are now two regular and one irregular cicatrices without induration, enlargement of glands, or rash. The house is filthy, and the child is very dirty.

(56.) *J. H.* Aged four months. During the second week arm was inflamed, and two of the vesicles have coalesced. There are now two cicatrices, one, the larger of the two, is elongated and thickened. The child is well.

(57.) *M.* Aged four months. Vaccination normal. Inspected by Mr. Davidson.

(58.) *E. W.* Aged four months. Vaccination normal up to the eighth day, when there was a well-marked areola, there was no enlargement of the axillary glands, and no rash. The scabs formed, and came off twice, once in the second week. As far as the mother knows, the arm was not injured, and the inflammation did not spread; two of the vesicles coalesced, and there is now one circular and one irregular cicatrix without induration, and with no enlargement of the axillary glands.

(59.) *G. H. H.* Aged five months. Vaccination normal. There are now three rather irregular, reddish cicatrices, without induration or enlargement of glands. The vaccination wounds healed well, and without any complication. The child is well. Scars normal when seen on the 22nd June 1893.

(60.) *P. H.* Aged nine months. The father informs me that during the second week after vaccination the arm was inflamed as far as the wrist. There appears to have been considerable ulceration of the vesicles, three of the pocks having run into two, and nearly two months after vaccination one small scab was still adherent. The child had suffered from eczema before vaccination, and now (September 1892) has eczema on the head and behind the ears, is puny, ill nourished, not well cared for. The house is very dirty.

(61.) *E.* Aged four months. Mr. Davidson informs me that vaccination was normal.

(62.) *S.* Aged three months. Vaccination normal. Inspected by Mr. Davidson.

(63.) *E.* Aged four months. Vaccination normal. Inspected by Mr. Davidson.

(64.) *A. J. A.* Aged 14 months. Up to the end of the second week the arm seemed to be progressing favourably, it then began to inflame, and swelled to above the shoulder and below the elbow. It was treated under Mr. Davidson's advice with poultices, and a large deep ulcer formed at the point of inoculation, comprising all three vesicles. A black slough eventually came away. There does not seem to have been any glandular enlargement or secondary abscess, but the arm was long in healing. The ulcer is said to have discharged for three or four weeks, and not to have been completely healed for six weeks. There is now one very irregular puckered cicatrix with a depressed reddish, rather indurated base, there is no enlargement of the axillary glands, but the left cervical glands are enlarged, and there is one as large as a small walnut on the right side of the neck. The child is rickety, its skull tends to be natiform, and its abdomen is large. It is suffering from bronchial catarrh, is emaciated and anæmic, and possibly tuberculous. It is said that four or five tubes of lymph were taken from the child's arm, but they could not be traced, as no record had been kept. The case is one of severe vaccinal ulceration, and, as I believe, not of syphilitic origin. When again seen, on the 22nd June 1893, the child was in much better health; it was delicate and had a strumous sore behind the right ear. The wound on the arm was well and firmly healed. He is a nurse child, but seems well cared for. He has always been delicate, and vaccination had been delayed for this cause.

(65.) *J. M.* Aged six months. Vaccination normal, with the exception of some slight inflammation round the vesicles. There was no discharge from the wound, no abscess, and the vesicles were well within a month of vaccination. There are now three scars, which are too close together, and there has been some slight loss of tissue.

(66.) *G.* Cannot be traced by Mr. Davidson, by the Vaccination Officer, nor by the Registrar of Births.

(67.) *S.* Aged four months. The grandmother informs me that the four points of insertion were put too close together, because the child would not sit still, the wounds coalesced and became covered with one scab. There had been but little inflammation, although the scabs had been rubbed off more than once, and no effort had been made to prevent irritation of the wound. The mother is dirty and slovenly, the child ill cared for; when seen its sleeve was rubbing right across the vaccination wounds, which were at that time unhealthy and eczematous. The child was suffering from eczema between the ears, in the folds of the neck, and in the nates. This eruption is said to have commenced during the second week after vaccination. The child's condition was unsatisfactory, but was largely, if not entirely, due to want of ordinary care and cleanliness.

(68.) *H.* Aged ten months. Vaccination normal. Inspected by Mr. Davidson.

(69.) *W. B.* Aged three months. Early in the second week the arm began to inflame, the inflammation spreading below the

elbow, and there was considerable enlargement of the axillary glands. About the 10th or 11th day the child suffered from a red, lumpy rash on the trunk and legs, which seems to have caused a great deal of irritation. Each lump did not last for more than two or three days, and, from what the mother tells me, I conclude that the eruption was urticaria. The vesicles discharged considerably, and they are even now (15th September, 1892) covered with thick yellow crusts. Where the crusts have fallen off soft pink cicatrices have been left. There is one scar on the forearm, which is also eczematous and which looks as if it had been caused by inoculation of pus from the vesicles. No application was made to the vesicles until after the 8th day, when cream was applied round them. The child is ill; three days ago it had a convulsion. On the 21st April 1893 Mr. Davidson took me again to see this case, as it had, he said, a "suspicious eruption." The child was much troubled with dentition, one tooth having recently been cut, and another on the point of being cut. The child had a moderate and not extensive urticaria. There were four rather puckered scars raised in the centre, and giving evidence of a considerable amount of inflammation. On the 21st June 1892 Mr. Davidson reported the child well.

T. Aged nine months. Vaccination normal. Inspected by Mr. Davidson.

W. Aged six weeks. Vaccination normal; scars normal. Child quite well.

G. S. Aged three months. Vaccination normal. There is said to have been some eruption on the vaccinated arm and on the leg during the second week. There were two normal cicatrices, and no rash when inspected. Child well.

B. Aged six months. Dr. W. saw the child, and informs me that vaccination was normal.

C. C. Aged seven months. Vaccination normal. Three irregular but otherwise normal cicatrices. Child well.

T. Aged three months. Vaccination normal. Inspected by Mr. Davidson.

R. B. Aged three months. Vaccination normal. The scabs have been knocked off twice, and healing in consequence delayed. There are two normal scars, one of which shows some little hypertrophy. The child is well.

C. Aged three months. Vaccination is said by sister to have been normal; there are three cicatrices, and the child is well.

W. H. Aged three months. Vaccination normal. Two normal cicatrices. The child is well.

mary. From the foregoing statement it will be seen that out of the 78 children, whose names appear in the vaccination register for July 1892, one is dead, one cannot be traced, and 76 have been inspected.

Of the latter I saw 50; Mr. Davidson (alone), 25; Dr. W. (alone), one.

In 32 of the cases inspected by myself, vaccination was normal, whilst in 18 from various causes there was some departure from the normal. In a large proportion of these the abnormality consisted only in some excess of inflammation, the ultimate result being satisfactory. Of the 25 cases inspected by Mr. Davidson, one (No. 28) is said to have had some ulceration of the vesicles, two of which ran into one. The child's grandmother, however, tells me that she noticed nothing wrong with the arm, and that it was quite well in three weeks. Mr. Davidson writes:—"P—— will have to be seen some time, for notwithstanding the grandmother's statement, from my notes and recollection there was considerable ulceration." I saw this case in April 1893, and found that vaccination had been normal until one of the scabs was knocked off, and that subsequently there was some little inflammation. Of the other case, D—— (No. 42), Mr. Davidson writes:—"The arm was bad, and a long time in healing, &c." (*See* page 335 of this report.) Mr. Davidson further wishes to call attention to the fact that 10 of the cases seen by myself have "some or all of their cicatrices "irregular or running together," but that I "mark them "normal." The cases to which he refers are Nos. 14, 15, 20, 30, 36, 40, 43, 45, 51, 59—of these cases I have noted that the cicatrices are *rather* irregular in 14, 15, 30, 51, and 59; irregular in 20, 36, and 45; elongated in 43; and that two vesicles coalesced in 40. There does not seem to be any ground for supposing that in these cases vaccination has pursued other than a normal course without complication.

The result of the inspection of the 77 cases traced is as follows:—

(*A.*) Vaccination appears to have been normal in 56.

(*B.*) Normal, with some excess of inflammation, in 12.

Of these:—

No. 24 was vaccinated from 23, who had severe inflammation round the vesicles the day after the lymph was taken.

No. 46 is said to have had the vesicles injured by the dress sticking to the wound every day for a week.

No. 67 was found with the pus-sodden sleeve rubbing and irritating the wounds; surroundings filthy.

In none of the cases does the lesion appear to have been serious, nor the ultimate effect on the child's health to have been deleterious. The ultimate result was satisfactory in all.

(*C.*) Some excess of inflammation followed by ulceration in seven cases.

In four of these a probable extraneous exciting cause was found, viz.:—

No. 25 was vaccinated from 23, who suffered, the day after the lymph was taken, from severe inflammation of the arm, with considerable ulceration of vesicles.

No. 48 was found with a dirty sleeve satured with pus rubbing right across the wounds.

No. 60 was a puny, ill-cared for child, who had suffered from eczema before vaccination.

No. 64 was a nurse child, rickety, probably tubercular, suffering from bronchitis, and in whom vaccination had been once postponed on account of feeble health.

In the remaining three, Nos. 6, 23, and 47, no extraneous cause was found.

(*D.*) There was cellulitis in one case:—

No. 37. This child was taken to see its grandmother, who was at the time suffering from a discharging abdominal abscess, and which resulted in her death from pyæmia.

(*E.*) There is no proof that the death of E. G., No. 17, resulted directly from vaccination.

The foregoing may be summarised as follows:—

(*A.*) Satisfactory - - - -	56
(*B.*) Some excess of inflammation, but ultimate result satisfactory - -	12
(*C.*) Some excess of inflammation and ulceration - - - - -	7
(*D.*) Cellulitis - - - -	1
(*E.*) Dead - - - - -	1
Not traced - - -	1
	78

From the above it appears that (8 or) 10·2 per cent. of the cases were seriously abnormal. That in five of these cases a possible exciting cause for the departure from the normal was found, leaving (3 or) 3·8 per cent. in which no cause, other than the vaccination, was discovered for the lesion. These figures do not tally with Mr. Davidson's statement than "in 50 per cent. of all vaccinated in this "period" the results were "abnormal," and in a "large "number of them very grave injuries had been inflicted."

It should be noted that in 37 out of 78 cases no record has been kept as to the source of lymph with which the children were vaccinated, and that in many instances the insertions were placed so near together that the vesicles had coalesced, although vaccination was otherwise normal.

With regard to the excessive amount of inflammation which occurred after vaccination during this period, attention may be directed to the methods of treatment generally adopted at ——, and not discouraged by some of the practitioners, notably Mr. Davidson. They consist in the application of buttermilk, cream, house-leek and cream, castor oil, poultices. In two cases that I have visited (though not vaccinated during this period) the applications have been made with a dirty feather. In one of these cases C. B. vaccinated on the 5th January 1893 the same feather was kept in the cream for some weeks without being washed, its use was followed by axillary abscess and septicæmia. In another case (E. H., No. 458,

July 1891) buttermilk was applied to the outside of a piece of muslin which was left sticking for three weeks to the wounds; in another buttermilk was applied which was left exposed to the air in the living room; in other cases the application was made with the finger. It is not to be expected where such methods of treatment are prevalent that open wounds should, as a rule, pursue a satisfactory course, and it can hardly be a matter of surprise if in the —— district vaccination is often followed by an unusual amount of inflammation and ulceration.

THEODORE DYKE ACLAND, M.D.

CASES 141–146, REPORTED TO THE COMMISSION BY MR. P. M. DAVIDSON.*

Cases of F. B. (Case 141)†, A. M. (Case 142), H. M. (Case 143), J. S. (Case 144), M. S. (Case 145), and A. D. (Case 146): report to the Commission of Dr. Theodore Dyke Acland.

Introductory. Mr. Davidson stated in his evidence before the Commission that, in his opinion, "bad arms of a suspicious "character often occur, where the vaccination wound does "not heal from three to six months, and then only after "more or less specific treatment," and that in these cases "there was a certain suspicion of syphilis." He also stated "that syphilis is undoubtedly occasionally communicated"; that he could give cases of it; and that he has had two undoubted cases. (*See* Mr. Davidson's answers to Questions 22,490, 22,492, 22,498, and 22,502 *et seq.*) In support of this last statement he alluded to the case of F. B. (Case 141), whose history is given below.

At the time of my visit to ——, in September 1892, Mr. Davidson was unable to trace the second case to which he referred in his evidence‡, but he brought to my notice nine cases which he considered "suspicious"—four of these cases, viz., E. S., E. H., E. J., and A. C., appear in the report on the results of vaccination at ——, in July 1891 (*see Case* 139 [*Series*], and have, therefore, not been inserted here. The remaining five cases (Cases 142, 143, 144, 145, and 146) are appended.

(A.) Case 141. Case alleged by Mr Davidson to have suffered from syphilis in consequence of vaccination.

Case of. F. B——. Born 28th September 1880.

Vaccination. Privately by Dr. M. in four places. According to the certificate on the 30th May 1881. F. B. was at this time eight months old, but it appears uncertain whether this is the date of vaccination, or that on which the certificate was given. Mr. Davidson states that in some instances many weeks are allowed to elapse between the operation and the signing of the certificates of successful vaccination, so that a child's age cannot be accurately determined by the certificate. In this instance Dr. Moss gives the boy's age at the time of vaccination as five months (in his evidence, in answer to Question 23,130); Mr. Davidson as six months (in his answer to Question 22,505); and the mother states that he was from three to four months old at the time.

This uncertainty is the more to be regretted since the sores on the head, which were taken by Mr. Davidson as definite evidence of syphilis, are known to have existed in October 1881, *i.e.*, when the child was 13 months old, and the precise date of vaccination becomes a matter of prime importance.

Source of lymph. Not known. Dr. Moss believes that he obtained the lymph from the Public Vaccinator, but cannot be certain, and has no record made at the time.

Co-vaccinees. No record.

Sub-vaccinees. By inference none. No record kept.

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* *See minutes of evidence of Mr. P. M. Davidson, L.R.C.P., appended to the Commission's Sixth Report, Questions 22,490-545, 23,084-5, and 23,102-28.*

† *See minutes of evidence of Mr. P. M. Davidson, appended to the Commission's Sixth Report, Questions 22,498-9, 22,504-40, and 23,084-9. The Commission also examined another witness as to this case (Case 141), the medical man who vaccinated the child in question. See minutes of evidence of Mr. H. Moss, M.D., appended to the Commission's Sixth Report, Questions 23,129-36.*

‡ *See minutes of evidence of Mr. P. M. Davidson, appended to the Commission's Sixth Report, Questions 22,504, 22,541-5, 23,084, and 23,128.*

Method of vaccination. Dr. Moss informs me that he invariably takes all necessary precautions as to the cleanliness of his instruments. As far as I could ascertain this vaccination was the only one performed at the time.

Cause of vaccination and illness. According to Dr. Moss's recollection of the case there was considerable local inflammation round the vesicles, and some discharge from them, by the 8th day; during the second week the inflammation had extended considerably and the vesicles ulcerated, eventually coalescing and forming one deep wound. Mr. Davidson states that this ulcer did not heal for three months, and that before it had healed, a rash appeared all over the child's body. Of this rash, which Mr. Davidson stated (in his answers to Question 22,506), to have appeared "long before the arm "healed," I was unable to obtain any accurate description. Mrs. B. says that she remembers that it was like measles, that it was raised, and that it itched very much, so that the child scratched it till it bled. She does not seem to have attached much importance to it at the time, and did not call Dr. Moss's attention to it. He has no recollection of it, so that there is no possibility of ascertaining its character or probable nature. If this rash had in fact been a secondary syphilitic eruption, as stated by Mr. Davidson, it is almost incredible that it should have escaped the attention of Dr. Moss, who was at the time treating the child's arm, and who had the suspicion in his mind that the case was one of a syphilitic character. (See his answer to Question 23,136.)

Up to this time Mr. Davidson had not attended the case, and he did not do so until the following October (1881), when the child was about 13 months old. Whether this was eight months after vaccination or not is very uncertain (see above), but it was more than four months. The child was then treated by him for two deep ulcers on the scalp. These he believed to be rupial (see his answer to Question 22,507) and he describes them as nasty, unhealthy ulcers with elevated edges and hard base, and indurated throughout (see his answers to Questions 22,528 and 22,537). He considered the case to be one of syphilitic rupia, and treated the child in this belief.

The case is stated to have been shown to Dr. Fletcher, one of the Local Government Board Inspectors. He writes as follows (8th September 1892) on the subject:—

"Referring to your statement that Mr. Davidson showed "me a case at his house, and that I was of opinion that it "was syphilitic rupia, I beg leave to say that the facts do "not conform with my recollection, but even assuming my "judgment to have been correct, the case was not a recent "one, and I did not in any way identify it with vaccination; "indeed I do not recollect that it was even suggested that "such secondary symptoms had followed on a primary "manifestation of syphilis at the seat of vaccination."

After the healing of the sores on the head an interval of some three years elapsed, during which the child did not require medical treatment. Mr. Davidson says that he then began to suffer from an offensive discharge from the nose, which continued for some years. Mr. B.'s recollection is that the discharge was not very offensive and that it lasted only for some *months*, and was accompanied by much discharge from the left external ear. Beyond this I have not been able to ascertain that the child presented any other symptoms which might be suggestive of secondary or tertiary manifestations of syphilis.

Present condition. F. B. is now, 13th September 1892, a slight, fairly nourished but not robust-looking child; his general health, as far as I have been able to ascertain, is reasonably good. At the point of vaccination there is a quadrilateral scar, measuring 1¼ inches by nearly 2 inches. Its outline is irregular; the scar itself is raised in the centre and much pitted at the circumference, there is no induration, no surrounding pigmentation, and no induration of axillary or cervical glands. On the left parietal region there is an irregular scar about the size of a halfpenny, with a serpiginous almost eroded margin, which is nodular and distinctly hard to the touch, and with a thin white base, without induration or adhesion to deeper structures. The hair at the point of ulceration has been completely destroyed, and there has evidently been considerable loss of tissue. On the right side, just above and posterior to pinna of the ear, is another similar scar, smaller, about the size of a threepenny piece and with irregular edges. There are no other scars of a similar kind to be seen. The complexion is clear. The corneæ are clear, the iris is not fixed, the pupils are regular and active, with no sign of old iritis, there is no chloriditis or disease of retina. There is no evidence of old ulceration or perforation of palate, the central incisors are square and regular, the lateral upper incisors are more conical than usual, but with nothing

characteristic about them, the lower teeth are well formed. There has not been any ulceration over the shins or any evidence of thickening of the periosteum. There has not been any pain in the bones. The nose is well formed, rather too broad at its base, perhaps in consequence of the ozœna, there is now no discharge and no evidence of old necrosis of bone or cartilages. There is no evidence of visceral disease.

Two brothers and three sisters are living, the three eldest children, who were all born at full time, died aged six, eight, and fourteen months respectively. They had no rash or snuffles. The two youngest were twins. The mother has had one miscarriage. The five youngest children have all been born in succession, without miscarriages intervening, and are still alive, F. is the youngest. From such examination as I was able to make I was unable to elicit any information which would lead me to suspect that the other children, or the parents, have suffered from congential or acquired syphilis.

At the time of vaccination, and during the development of the symptoms which were supposed to indicate inoculated syphilis, the child was suckled by its mother, who had not at the time, and has not subsequently shown any sign of having contracted the disease from him.

From the length of time which has elapsed since the vaccination, and from the fact that no record written at the time has been preserved, I have not found it possible to fix with precision the dates at which the various symptoms developed themselves. If it be correct that within 12 weeks of vaccination a general eruption appeared over the body, which some few months after was succeeded by a pustular eruption and later on by ozœna there is *primâ facie* ground for inquiry whether this was a case of inoculated syphilis.

The manner in which the vaccine vesicles developed, and the amount of inflammation which surrounded them, are not typical of primary vaccinal syphilis, although, as is well known, it is far from uncommon for a non-infective sore to be the precursor of an infective one. To establish proof of the infective nature of such a sore, reliable evidence of secondary infection should be produced. In the present case there is neither evidence to show that the inflamed sore was succeeded by a syphilitic chancre, nor to how what was the condition of the glands during the development of the sore. Further, the absence of any definite information as to the nature of the rash from which the child suffered at some period before the sores were healed, and the certain evidence that it itched, makes it still more difficult to decide whether it was a secondary manifestation of syphilis or not. Lastly, the scars on the head, although they show that considerable ulceration has occurred, are not necessarily characteristic of syphilis. They might have been due to impetigo, or any superficial ulceration, though the fact that they are more or less symmetrical is a point in favour of their specific origin.

It may be urged in favour of the view that this was a case of inoculated syphilis:—

(1.) That vaccination did not pursue a normal course; the development of the vesicles being accompanied by a considerable amount of ulceration.

(2.) That a general eruption is stated to have followed vaccination at a date subsequent to that at which vaccinal eruptions, as a rule, commence, and at the period at which the secondary developments of syphilis usually show themselves, *i.e.*, between the 8th and 12th week.

(3.) That this rash, instead of being transient, as is generally the case in vaccinal eruptions, is said by the mother to have lasted for some weeks.

(4.) That within a few months (four to eight at the outside) after vaccination, a more or less symmetrical suppurative eruption appeared upon the head, characterised by considerable loss of substance, and the formation of thick heaped-up crusts; this the eruption was seen by Mr. Davidson, was believed by him at the time to be syphilitic rupia and treated as such.

(5.) That this eruption was followed after an interval of three years by an offensive nasal discharge lasting some months.

On the other hand it may be urged against the view that this was a case of inoculated syphilis:—

(1.) That all the vaccination vesicles were affected.

(2.) That not one of them is known subsequently to have taken on the typical appearance of a vaccinal chancre.

(3.) That inflammation commenced round the vesicles within a week of vaccination, and that the phenomena which followed might have been merely inflammatory.

(4.) That the amount of suppuration and inflammation were much in excess of that which is usually present in cases of vaccinal syphilis.

(5.) That the ulcers healed as soon as the inflammation subsided.

(6.) That the characters of the general eruption and the date of its appearance were not accurately noted at the time, that there are now no means of definitely ascertaining its nature; that it is described by the mother as like measles, and to have been very irritating; and that Dr. M., who was actually attending the child for the sore on its arm which he supposed to be syphilitic, did not even notice the rash, and has no recollection of it.

(7.) That if the sores on the head were rupial they developed unusually early, the time at which such an eruption generally appears being 6 to 12 months.

(8.) That the scars are serpiginous and eroded, not circular nor pigmented.

(9.) That no tertiary phenomena have yet shown themselves except possibly the offensive nasal discharge.

(10.) That the mother who suckled the child was not infected.

Conclusion. Taking all these circumstances into consideration, it would seem that Mr. Davidson had ground for his suspicions, but the facts obtainable so long after the events are not sufficiently accurate to make the diagnosis certain, especially in view of the fact that it is impossible to trace the source of lymph; and further that the characters of the ulcers on the head and of the eruption on the body were not recorded at the time. The child does not now present any unmistakable symptoms of inoculated or inherited syphilis.

Mr. Davidson has read the above statement and informs me that he considers that it represents the facts of the case as far as they are known to him, although he does not admit the doubt as to their significance.

(B.) Cases 142, 143, 144, 145, and 146. Cases alleged by Mr. Davidson to present a certain suspicion of invaccinated syphilis, but not included in the reports on the vaccinations at the —— public station in July 1891 (*Case* 139 [*Series*]) and in July 1892) *Case* 140 [*Series*]).

(i.) *Case* 142. A. M., aged 12 years.

Vaccination. Date uncertain, but probably in 1881, when 12 months old, vaccination having been postponed owing to the child's ill-health.

Source of lymph. No record.

Vaccinifer. No record.

Co-vaccinees. No record.

Sub-vaccinees. No record.

Course of vaccination. According to the mother, the arm was inflamed by the second week after vaccination. The vesicles ulcerated, the four pocks forming two ulcers. These ulcers are said to have continued discharging for some months; but there was no further complication, either enlargement of glands, abscess, or cutaneous eruption.

Treatment of vesicles. Nothing of importance ascertained.

Present state. At the point of vaccination there are now (Sept. 1892) two large puckered cicatrices, showing that there has been considerable ulceration and loss of tissue. The child is now in feeble health: it has chronic nasal catarrh. Complexion anæmic, not earthy. Corneæ, clear. Teeth, regular. Bones, no nodes or periosteal thickening. Abdominal viscera, nothing abnormal detected. Nutrition, poor.

Family history. There are nine children in the family, of whom I saw the two youngest, who have not been vaccinated. They

are both pale, pasty, and unhealthy-looking; one of them has a considerable mass of strumous glands in the neck and chronic blepharitis. The other is suffering from eczema.

General surroundings. Dirty and unwholesome. The back premises are offensive, both from their own obvious sanitary defects and from the leakage of what appears to be urine from a neighbouring house.

Summary. The child is an unhealthy member of an unhealthy family living in surroundings which cannot fail to be prejudicial to health. Its health was feeble before vaccination and has not improved since. Vaccination was followed by considerable ulceration, but neither the evolution of the symptoms nor the child's present condition seem to give any sufficient ground for the suspicion that syphilis was inoculated at the time of vaccination.

(ii.) *Case 143.* H. M., aged 16½ years.

Born. 25th February 1876.

Vaccination. When three months old by Public Vaccinator.

Source of lymph. Direct from the arm of F. S. J., now aged 17, whose vaccination pursued a normal course and who has been in good health ever since. With regard to the statement made that the case of M. was "suspicious," it should be noted that the family history of the vaccinifer is, according to Mr. Davidson's statement, very bad; he informs me that he knows that the father has suffered from syphilis, and he believes the mother to have done so. I was unable to elicit the grounds on which these statements were made, and inasmuch as I was not able to detect any sign of inherited taint in the child F., I did not consider it desirable to press my inquiries further.

Vaccinifer. F. J. is a well-grown, plump, clear complexioned girl; her forehead is a little prominent, the nose is not depressed, the skull is well formed. She has not been liable to sore throat, there is no evidence of any old or recent ulceration of the palate. Her hair is plentiful and never fell out. She has no sores on the body (as a baby she is said to have had one on the leg). She is not known to have suffered from snuffles or ozœna. The cornæ are clear and bright, there is no evidence of old iritis. The front teeth, with the exception of one right central incisor, which has been knocked out, are regular; the back teeth are decayed. Both she and her mother state that she has, as a rule, enjoyed excellent health. I was unable to detect any evidence that she is the subject of syphilis either acquired or inherited.

Course of vaccination and illness. Much of the information which I have been able to obtain about the course of vaccination and illness in this case is indefinite and probably unreliable. Mrs. M. states that the arm became very much inflamed soon after vaccination, "certainly within a month," or "certainly "not later than six weeks," and that there was a good deal of discharge from the vesicles. She says that before the wounds on the arm were well, an eruption or a small sore commenced at the external angle of the left eye; the the skin became red and angry-looking, with a slight watery discharge; this, she states, gradually spread down the face, the upper part healing as the lower part became affected, and subsequently another patch lower down and nearer the ear became affected in the same way, reaching its maximum in three or four months. She further states that during this time there was a considerable amount of discharge from the wounds, and that this discharge did not commence for some time after the face became affected. She did not at first obtain any medical advice, but subsequently consulted Mr. Davidson, who attended the child for some time. He practically remembers nothing about the case and had not seen the child for 13 years or more, when his attention was recently called to it. After Mr. Davidson had been attending it for some time, as the wound did not heal, the mother took the child to Dr. W., who treated the face, as he informs me, under the supposition that it was strumous and not syphilitic, and it rapidly healed. He recollects the case well, and remembers that the wound was unhealthy, with many sinuses, which required opening and treating with nitrate of silver. Mrs. M. states that the child was twice put under chloroform for operations on the face. Dr. W. informs me that this was the case, and that he applied caustic, reduced granulations, and opened sinuses, and that under this treatment it rapidly got well. He regarded the case during the whole time as one of scrofulous ulceration of the skin, and did not at any time treat it as a case of syphilis.

There is a great discrepancy in the statements made by Mrs. M. and Dr. W. as to the date at which the child was under Dr. W.'s care. Mrs. M. states that the affection of the face commenced immediately after vaccination, and that the child was under Mr. Davidson's care only for a few months; and that as it did not improve she took it to Dr. W., and she did not consult any other doctor. In Dr. W.'s register there is the following entry under the name of M. "To attendance on your son and operation on "face under chloroform, Jan. 13 to Oct. 16, 1879." There is no reason for doubting that this entry is correct. The boy, in January 1879, was nearly three years old, so that an interval of more than two and a half years has to be accounted for between the time at which Mrs. M. states that the affection of the face commenced and the time at which it was first seen by Dr. W. If any confirmation of the accuracy of Dr. W.'s entry were needed, it is corroborated by a statement made by Mrs. M. to Mr. Davidson to the effect that the operation on her child's face did not take place until some time after the death of her sister (E.). This sister died, according to the register, in May 1878, *i.e.*, when the child was two and a quarter years old. It may be noted that if Mr. Davidson suspected that the case was one of syphilitic ulceration and employed remedies under that impression, the wound instead of healing continued to increase, and it was not until the child was put under such treatment as would be necessary in a case of scrofulous ulceration that the face began to heal. I have been unable to obtain any satisfactory history of the period which elapsed between the time of vaccination and that at which the child came under Dr. W.'s treatment, and have not been able to find any corroboration for the mother's statement, "that the sore on the face commenced one month "after vaccination." It seems from the evidence to have commenced two years or more after that operation.

Present condition. There are now two large elongated, rather irregular scars upon the left side of the face, both presenting approximately the same characters; the edges are irregular and the upper part of the inner scar is pitted; the central part is smooth, florid, and shining; the edges are rather thickened and in some places nodular. There is one subcutaneous nodule just below the lobe of the ear over which the skin is adherent and shining; the floor of the wound is not thickened or pigmented; there is enlargement of the neighbouring glands. There are three normal vaccination scars and one which is less marked, being partially obliterated. The cornæ are clear, there is no sign of old iritis. The incisor teeth are regular at the edges, but decayed towards the gums. The complexion is clear. There is no deafness, and no liability to sore throat. The lad is said to have enjoyed good health as a rule; he is of slight build and far from robust, and there is some deficiency of power in the left arm and left leg. This is said to have been noticed when he was a child, and has not increased.

Family history. The mother's family shows a strong tendency to tubercular disease. Her father died, æt. 40, of "Potter's disease," *i.e.*, consumption.

Of two brothers one died of "Potter's disease," aged 40.

Of five sisters three are dead:—
One of "Phthisis pulmonalis," aged 38.
One of "Lardaceous liver; exhaustion," aged 44.
One "in her confinement."

On the father's side there is nothing of note. His father died of "pneumonia."

Previous history. Believed to be good.

Note.—The mother suckled the child the usual length of time, and did not at the time have any sore on the nipple or in any other part, nor did she subsequently suffer from any eruption on her body.

Conclusion. There is nothing characteristic of syphilis in the history of the case or in the present appearance of the wounds upon the face or of the vaccination scars. As far as I have been able to ascertain it correctly, the history, and the method of treatment, which proved successful, would seem to show that the injury, however it was produced, was of strumous and not of syphilitic origin. The appearance of the wound now suggests to me that it is one of lupus, which has been successfully treated.

The statement made by the mother that the ulceration of the face commenced immediately after vaccination does not seem to be borne out by the evidence. The fact that Mr. Davidson, who first attended the case, has no recollection that the condition of the face was at the time attributed to vaccination, and the entry in Dr. W.'s book, which shows conclusively that the child did not come

under him for treatment until it was nearly three years old, make it probable that the mother's statement is inaccurate. If it were correct, the question of the wound being syphilitic might practically be excluded; for if it had been syphilitic it would have been a secondary or tertiary manifestation of that disease, and could not, therefore, have commenced within a month of inoculation, unless it were a phagœdenic ulcer caused by direct inoculation from a similar sore at the point of vaccination. This latter hypothesis is untenable in face of the strong evidence that the child was not put under medical treatment at the earliest for more than two and a half years after vaccination, and that the vaccination wounds did not at any time undergo phagœdenic ulceration.

Mr. Davidson has read the above statement; he considers that it represents the facts as far as they can be ascertained, and he wishes to withdraw the case from this series of suspicious cases.

J. S., aged 22 months.

In April 1891 by Public Vaccinator.

Doubtful.

The mother informs me that she noticed nothing abnormal before the end of the first week. She says that the child was not taken back to be inspected on the eighth day because he was so unwell with bronchitis. Her recollection of the facts is not sufficiently accurate to enable her to speak as to details with certainty, but she recollects that the vesicles discharged offensive matter for about a fortnight, after which the arm healed, and has not again broken down. One abscess formed at the back of the left shoulder, and one on the right buttock, but, as far as I can ascertain, there was no general eruption of the body, and no enlargement nor suppuration of the axillary glands.

As far as the mother knows, the scabs were not injured or knocked off; she applied castor oil, house-leek and buttermilk with a feather, "barm," and white bread poultice. She states that the wounds healed in one night after the barm poultice.

There are now four large regular cicatrices at the seat of vaccination; the two outer ones have raised scars which are not indurated, but feel pulpy, the centre is dusky, and is surrounded by a paler zone. There has been considerable ulceration. There is a scar at the back of the left shoulder, and a very minute one over the right hip. The child's nutrition is good, and it is in good health. Its skin is clear, and free from eruption of any kind. It shows no signs of acquired or congenital syphilis.

The child suffered from ulceration of and around the vaccination vesicles, with secondary abscesses; I have been unable to elicit any facts which would lead me to suspect that the child was inoculated with syphilis.

M. S., sister of preceding case.

I was unable in this case to obtain any information which would lead me to suppose that vaccination pursued other than a normal course. The child has not suffered since vaccination from eruption on body, enlargement or induration of glands, and shows no sign of constitutional disease, neither is there any evidence that there was undue inflammation round the vesicles. There are now four large rather irregular cicatrices, which seem to be compatible with the view that vaccination was not attended by any unusual symptoms.

In this case there is no evidence to show that the child has suffered from syphilis, either inherited or inoculated at the time of vaccination. *Conclusion.*

A. D., aged nine years. (v.) *Case* 146.

When an infant, in four places. *Vaccination.*

No record. *Source of lymph.*

I was unable in this case to obtain any consecutive or reliable information as to the course of vaccination, except that there was a considerable amount of inflammation round the vesicles, that ulcers formed, and that the arm was many weeks in healing. The boy is now well. There are three large cicatrices, the two inner vesicles having coalesced; this latter scar is glazed and raised in the centre, those of the two outer ones are large, otherwise normal. There has been considerable loss of tissue from ulceration of the vaccine pocks, but the boy shows no evidence of syphilis, either acquired or congenital.

This case seems to have been one of vaccinal ulceration, of a simple character, and, though the information is indefinite, that which I was able to obtain did not give any ground for belief that syphilis had been inoculated at the time of vaccination. *Conclusion*

None of the five cases examined shows (September 1892) any evidence of syphilis acquired or congenital. In three of them (Cases 142, 144, and 146) vaccination was followed by ulceration; in one (Case 145) vaccination seems to have been normal, and in one there is no evidence to connect the lesion which seems to have followed after an interval of two years or more with the foregoing vaccination. *General Summary; Cases* 142, 143, 144, 145, *and* 146.

THEODORE DYKE ACLAND, M.D.

CASES 147–155, REPORTED TO THE COMMISSION BY MR. P. M. DAVIDSON.

Cases of E. C. (Case 147), *M. C. (Case* 148), *F. H. (Case* 149), *J. W. C. (Case* 150), *A. S. (Case* 151), *A. W. (Case* 152), *M. J. S. (Case* 153), *M. J. C. (Case* 154), *and M. J. P. (Case* 155): *report to the Commission of Dr. Theodore Dyke Acland.*

Amongst the cases of injury brought to my notice while making an inquiry into the results of vaccination at —— (Case 139 [Series]), and Case 140 [Series], there were 11 in which Mr. Davidson stated that, in his opinion, death had resulted in or between the years 1870 and 1892 directly from vaccination. *Introductory.*

The names of the cases, the date of death, and the certified cause of death are as follows:—

——	Name.	Date of Death.	Certified Cause of Death.
(i.) *In Case 140 [Series]; see page* -	E. G.	16 July 1892	Inquest. Verdict, "that death was probably due to convulsions."
(ii.) *In Case 139 [Series]; see page* -	A. D.	23 August 1891	Broncho-pneumonia. (F. W. W., M.D.)
(iii.) Case 147 - - -	E. C.	21 May 1890	Atrophy. (H. M., M.D.)
(iv.) - - - - -	H. C.	13 December 1889	Convulsions occasioned by whooping-cough. (H. M., M.D.)
(See paragraph c. below as to the substitution of M. C., Case 148, for H. C.)			
(v.) Case 149 - - - -	F. H.	20 August 1888	Dentition; convulsions. (W. T. F., L.R.C.S.)
(vi.) Case 150 - - - -	J. W. C.	16 March 1886	Scrofula; scrofulous ophthalmia; convulsions.
(vii.) Case 151 - - - -	A. S.	22 February 1883	Inquest. Verdict, "Death from convulsions."
(viii.) Case 152 - - - -	A. W.	13 January 1882	Pertussis, 21 days. Convulsions, one day. (P. M. Davidson, L.R.C.P.)
(ix.) Case 153 - - - -	M. J. S.	6 May 1870	Tabes mesenterica. (J. T. W. B., M.B.)
(x.) Case 154 - - - -	M. C.	2 January 1888	Broncho-pneumonia. (P. M. Davidson, L.R.C.P.)
(xi.) Case 155 - - - -	M. J. P.	10 August 1868	Diarrhœa, three days. (Not stated by whom.)

The evidence on many of these cases is most unsatisfactory, as may be gathered from the following statements :—

(*a.*) *A. S.* (No. vii. in the above list), daughter of F. S., ——, is stated by Mr. Davidson to have been vaccinated about the usual age (when 15 weeks old according to mother), and to have died on February 22nd, 1883, seven days after vaccination ; an inquest was held on February 23rd, 1883.

A copy of the dates of birth and vaccination, certified by J. B., Registrar and Vaccination Officer, is as follows :—

A. S., of ——, date of vaccination certificate 29th September 1881 (born 11th June 1881).

If the same child is referred to in both cases there is a discrepancy of some 15 months between the certificate of vaccination and the dates given by Mr. Davidson.

(*b.*) *A. W.* (No. viii.), ——, is stated by Mr. Davidson to have died about a fortnight after vaccination on the 13th January 1882. He gave a certificate of the cause of death "Pertussis ; convulsions." This certificate is dated the 13th January 1882. The copy of dates of birth and vaccination certified by Mr. B. states :—

A. W., of ——, date of vaccination certificate 15th February 1883 ; born 10th November 1882.

Mr. Davidson in sending these certified copies of certificates (which, without further inquiry, he accepted as correct) says, "You will see that one "child is said to have been vaccinated some "years before it was born and another a long "time after it was dead." On making still further inquiry it was ascertained that the *registers* are correct, but that in the copy sent to me by the Registrar the two cases had been confused, and the dates of birth and vaccination of the one child substituted for those of the other.

As a further illustration of the difficulty of obtaining precise evidence in these cases, it may be noted that—

(*c.*) *H. C.* (No. iv.), of ——, is stated by Mr. Davidson to have been vaccinated when about three months old, and to have died in consequence of vaccination on 13th December 1889, the cause of death being certified as "Convulsions occasioned by "whooping-cough."

H. C. had not been vaccinated, and Mr. Davidson had confused the case with that of M. C., his sister, who died on 26th December 1889, the cause of death, as certified by Dr. H. M., being "Tabes mesenterica."

From the above statement it cannot be doubted that some of the evidence in three out of the nine cases is inaccurate, of the rest Mr. Davidson wishes to withdraw the case of M. J. P. (No. xi.), so that no further inquiry has been made into it.

One case, M. C. (No. x.), I was unable to see, as the parents have removed from ——. Of the remaining six cases, two (Nos. ii. and v.) died directly as the result of a complication of vaccination, while in the case of E. G. (No. i.), E. C. (No. iii.), J. W. C. (No. vi.), M. J. S. (No. ix.), although the parents believe that death was the result of vaccination, the evidence is either contradictory, insufficient, or contrary to the belief of the doctor who signed the certificate of the cause of death after attending the child in its fatal illness.

The details of the cases, substituting M. C. for H. C. (No. iv. in the list given above), as far as I have been able to learn them, are as follows :—

(i.) *In Case* 140 [*Series*].

E. G., aged three months (No. 157 in register).

Vaccination. 7th July 1892, by Public Vaccinator.

Death. 16th July 1892.

Coroner's Inquest. 29th July 1892.

Verdict. "That the deceased E. G. was found dead in bed, such death being probably due to convulsions, and the jury are further of opinion that such death was due to natural causes."

For further details see report on Case 140 [*Series*] *at page* 334.

(ii.) *In Case* 139 [*Series*].

A. D.

Vaccination. 9th July 1891, by Public Vaccinator

Death. 23rd August 1891.

Certified cause. "Broncho-pneumonia."

Certified by. Mr. F. W. W., M.D.

For further details see report on Case 139 [*Series*] *at page* 330.

(iii.) *Case* 147.

E. C., aged 10 months.

Vaccination. When nine months old, in April 1890, privately by Dr. M. Vaccination is said to have been postponed because mother was away, not because the child was ill.

Death. 21st May 1890.

Certified cause. "Atrophy."

Certified by. Mr. H. M., M.D.

Source of lymph. No record.

Vaccinifer. No record.

Course of vaccination and illness. The mother states that the arm began to inflame on the third day, and that the child on this day had a convulsion. The inflammation extended down to the wrist, and on the eighth day was so severe that the child was not taken back for inspection. On the ninth day the vesicles are said to have been opened by Mr. F., but during the second week the inflammation increased, and the child had two or three "fits." It suffered about the beginning of May from vomiting for three or four days, and later from purging, and rapidly emaciated. The inflammation of the arm entirely subsided, and the diarrhœa lessened before the child's death.

Dr. M. attended the child during this time, and considered that its condition was due gastro-enteric catarrh, which had arisen indepently of vaccination.

Treatment of vesicle. When the arm was inflamed the vesicles were poulticed.

Previous history. Said to have been good, but the child was not well a month before vaccination. Vaccination was not, however, postponed in consequence. It was hand fed on various infants' food.

Family history. Not good. *Mother* is an anæmic, delicate-looking woman, who is always ailing. *Father*, not seen. Dr. M. informs me that there is a tuberculous tendency in his family ; that one brother suffers from a "strumous knee," and one from enlarged glands.

General surroundings. Fairly satisfactory, but mother has had much domestic trouble.

Summary. E. C. died of gastro-enteric catarrh some four weeks after vaccination. There was excessive inflammation round the vesicles, and during the second week the child suffered from convulsions, and subsequently from purging and vomiting. It would seem probable that the constitutional disturbance set up by the inflamed arm was the starting point of the child's illness, and that although the previous and family histories are not entirely satifactory, yet that the abnormal vaccination must be held to be primarily responsible for the child's death.

(iv.) *Case* 148 ; *substituted for H. C.*

M. C., aged 16 months.

Vaccination. Probably April 1889, by Public Vaccinator.

Death. 26th December 1889.

Certified cause. "Tabes mesenterica."

Certified by. Mr. H. M., M.D.

Source of lymph. Uncertain.

Vaccinifer. Uncertain.

The details of this case are very uncertain. Vaccination is stated by the mother to have been postponed for a "time or two" on account of the child's being weakly, and having a large head. Shortly after vaccination the arm inflamed a great deal, and the pocks ran into one, forming a deep ulcer. She also states that there was an eruption on the arm from the shoulder to the elbow, and down the left side of the back. She says that the wounds never healed, but that she did not think it necessary to obtain any medical advice for them. About five weeks after vaccination she took the child to Dr. M., because it was rejecting all its food; and he treated it for mesenteric disease until its death. No mention was made to him about vaccination, or that the parents believed that it was the cause of the child's ill-health, and he was not asked to treat the arm.

Cream, skim milk, and warm water were applied to the wounds.

Bad. The child was always weakly.

Very bad. The *mother* is puny, feeble, sickly, with old corneal ulcers. *Father*, not seen. Of seven children three only are alive. The eldest, aged nine years; the third, aged six years; and the baby, who is miserable, puny, ill nourished, and ill cared for. The other children have died in infancy at three weeks, 19 days, and five months old respectively.

Filthy; the house and its inhabitants are dirty and ill cared for.

M. C. was an unhealthy member of an unhealthy family, living in filthy surroundings; the arm was unduly inflamed, and the method of treatment adopted was such as to prompt rather than check the inflammation. There can be little doubt on the evidence that vaccination and its complications constituted one factor in the child's illness, but it can hardly be doubted that its own ill-health and its unsatisfactory surroundings contributed largely to the fatal result.

F. H.

12th July 1888, by Public Vaccinator.

20th August 1888.

"Dentition; convulsions."

Mr. W. T. F., L.R.C.S. Ed.

Said to be direct from arm of F. M. (Mr. Davidson).

Mr. Davidson states that the arm was severely inflamed after vaccination, and that an axillary abscess formed which ruptured and discharged. The child is now healthy with one vaccination scar showing signs of past ulceration, and there is a cicatrix in the axilla.

None.

Shortly after vaccination the arm became much inflamed, and the glands in the axilla became much enlarged. Mrs. H. took the child to Mr. F., who told her that the abscess should be opened. This she declined to have done as Mr. Davidson was her doctor. On the advice of a friend she treated the axillary swelling with onion poultices for about 10 days; the child then had a convulsion and she sent for Mr. F. She says that she intentionally concealed from him the fact that the child had a swelling in the axilla, and that he had advised that it should be opened, since she wished Mr. Davidson to do it, and she allowed Mr. F. to lance the child's gums under the impression that the convulsion was due to dentition. Mr. Davidson then took charge of the case; he opened an axillary abscess about one month after vaccination and evacuated a considerable quantity of pus, but cellulitis of the neck and face supervened, and the child died on the 20th August about six weeks after vaccination.

The vesicles were treated in accordance with the usual custom at ——, with buttermilk applied on a rag four or five times a day.

Mother did not rally well from her confinement. She was ill, but, as far as I could ascertain, not with puerperal fever. She was obliged to wean the child when it was a month old.

Dirty and poor.

The child died of axillary abscess and cellulitis of neck and face, which were secondary to the excessive inflammation of the vaccination vesicles. Several circumstances seem to have contributed to the fatal result. Both the child's family history and surroundings were unsatisfactory, the vaccination wounds were kept moist and irritated by the frequent application of a decomposible fluid (buttermilk); the axillary abscess when formed was allowed to remain unopened for 10 days in spite of medical advice, and, lastly, when a doctor was called in he was intentionally kept in ignorance of the nature of the case. Vaccination was the determining cause of the child's illness, but it cannot be doubted that other circumstances contributed to bring about the fatal result.

J. W. C. (vi.) *Case* 150.

When nine months old, probably in October 1884, by Public Vaccinator. *Vaccination.*

16th March 1886, when two years old. *Death.*

"Scrofula; scrofulous ophthalmia; convulsions." *Certified cause.*

Dr. W. *Certified by.*

Unknown. *Source of lymph.*

The events of this case occurred nine years ago, and I have been unable to get any consecutive history of it. The mother's statement is to the effect that within a week of vaccination the arm inflamed very much; that all the vesicles ran into one forming an ulcer, which, though it got better, was not healed 15 months afterwards at the time of the child's death. She says that about three months after vaccination an eruption broke out on the child's head which discharged a great deal and formed scabs. Then the eyes became inflamed, discharged much matter, and eventually the child became blind. The only evidence I have been able to obtain points to the fact that during the whole of this period no medical advice had been obtained for the child, since Dr. W., who is stated to have attended him, has no entry in his ledger previous to the 19th February 1886, *i.e.*, about one month before its death, as will be seen from the following letter:—

"With reference to the case of J. W. C. I actually made
"a memorandum of the disease the child had on
"February 19th, 1886, on the occasion of my being
"first called in. As regards the '*blindness*,' I well
"remember the astonishment of the parents and grandmother, Mrs. H., when I informed them that the
"sight was probably lost, so that if the child recovered
"it would have poor sight."

Dr. W. adds:—

"I was much surprised at the death being attributed to
"vaccination, for I well remember being called in to
"this child (J. W. C.) casually as I was passing the
"house. I was greatly shocked at the neglected con-
"dition I found it in. It had some scrofulous sores
"about it, and the eyes were much inflamed, and
"the cornea involved. I cannot remember that the
"vaccination was mentioned to me. It might have
"been, but it would not impress me at the time as
"I was fully satisfied that the delicate state of the
"mother, the overcrowded state of the cottage,
"absence of ventilation, &c., and the ignorant (but
"well meant) treatment on the part of the parents
"and grandmother had conduced to the miserable
"state of health in which I found the child. I have
"no reason to believe that any other medical man
"saw the child before I did, and that the whole treat-
"ment had been conducted by the people themselves.
"As the child never opened its eyes the parents were
"not aware that the child's sight was gone until I
"told them on February 19th, 1886."

Said to have been good. *Previous history.*

Mother and grandmother seem healthy. There are four children living; one is (June 1893) suffering from impetigo. One has a sore on its face, said to be the result of a fall. The youngest child, aged nine months, is sickly looking, feeble, and anæmic. *Family history.*

As good as those of most labourers' cottages. The living room is freely open to the air, and so cold during the day and close at night. No obvious sanitary defects noted. *General surroundings.*

The information obtainable in this case is of the most uncertain kind. I have seen Mrs. C. both with Dr. W. and Mr. Davidson, and have failed to obtain any consecutive or reliable history of the case. Dr. W., who seems to have been the only doctor consulted, did not see the child until more than a year after vaccination, and he is of *Summary.*

opinion that when he was called in no mention was made of vaccination as a possible cause of the child's illness. The data are too vague to form any reasonable conclusion as to the cause of the child's death.

(vii.) *Case 151.*

A. S.

Vaccination. 15th February 1883.

Death. 22nd February 1883, when 16 weeks old.

Inquest. 23rd February 1883.

Verdict. "That on the 22nd day of February 1883, the said A. S. did die suddenly from convulsions, and the jurors do further say that such death was due to natural causes."

Course of vaccination and illness. According to Mrs. S. the arm was inflamed before the seventh day, and Mr. Davidson states that he was called to see the child and found it dead. The seat of vaccination was, he states, angry and sore, and he declined to give a certificate of the cause of death, though he had no doubt as to its real cause. He did not, however, appear at the inquest to give evidence, and no expert evidence was called by the Coroner. The depositions are given below :—

Deposition of Witnesses severally taken and acknowledged on behalf of our Sovereign Lady the Queen at ——, this 23rd day of February 1883, before me, H. C. Y., Esquire, one of the Coroners of our said Lady the Queen of and for the said County of ——, upon an Inquisition then and there holden, on view of the body of A. S., then and there lying dead, as follows :—

F. S., sworn : I live at ——, and am a fustian cutter and a spinster. The deceased was my daughter and was 15 weeks old. I sent my child to be nursed by a Mrs. W. I took it to her on Wednesday at 7.30 o'clock. She was quite well then. I went to work. After coming from work I went for it and took it home. It appeared strange. I gave it the breast, but it was very sick. I took it to bed at 7.30 o'clock p.m. I laid it on the bolster. I then had to go and do some washing. In about half an hour I heard deceased crying. I offered it some bread and milk. I then took it to bed, and it went to sleep. I went upstairs to fetch it to feed it some time after, but it wouldn't awake. I then went to bed. I didn't awake until a quarter to 8 o'clock a.m. It was then quite dead. There was froth coming from the mouth, and her hands were clenched. I sent for Mr. Davidson, who came and stated that she had died from convulsions.

J. W. : I am wife of J. W., overlooker, and live next door to last witness. I have nursed deceased since it was a month old. The deceased's mother has been to see her child morning, noon, and night. I observed that the day before the child's death it worked its head about. I told its mother so. When I had fed the deceased this day it didn't take its food at all well.

Verdict : That on the 22nd day of February 1883 the said A. S. did die suddenly from convulsions, and the jurors do further say that such death was due to natural causes.

Previous history. The child was illegitimate, and out at nurse when vaccinated. It was partly fed by hand and partly with the breast when the mother came from work. It is said to have been healthy previous to vaccination.

Family history. Good. There are five other children, believed to be in good health; one had eczema after vaccination. I saw Mrs. W., who nursed the child, but was unable to elicit any facts which threw new light on the case.

Summary. No post-mortem examination was made, and the evidence obtainable is not sufficient to warrant any certain conclusion being drawn as to the actual cause of death. Mr. Davidson's belief that vaccination was directly the cause of the child's death is founded on the statement made by the mother that the child had been well previous to vaccination, and that the arm was inflamed when he saw it after death.

(viii.) *Case 152.*

A. W., aged seven months.

Vaccination. 29th September 1881.

Death. 13th January 1882.

Certified cause. "Pertussis ; convulsions."

Certified by. Mr. P. M. Davidson.

Source of lymph. Uncertain.

Vaccinifer. Uncertain.

Sub-vaccinees. None. Vesicles not opened.

Course of vaccination and illness. According to Mrs. W. the child's arm was so much inflamed by the eighth day that she did not take it to be inspected. A swelling formed in the axilla, and another in the neck. Neither of these swellings broke down or discharged. Before death the child suffered from convulsions. Soon after it was vaccinated it began to suffer from whooping-cough, and was attended by Mr. Davidson. He corroborates the above statement, and is of opinion that the condition of the arm was the cause of death and not the whooping-cough, in spite of the fact that he gave the above certificate. There is a considerable discrepancy in the dates given, which I have been unable to reconcile ; Mrs. W. states that the child died about 14 days after vaccination, but the certificate of successful vaccination is signed by Dr. W. on the 29th September 1881, 14 weeks before death. Neither Mrs. W. nor Mr. Davidson were able to give me any further information about the course of the child's illness.

Previous history. Believed to be good.

Family history. Father died of phthisis. Mother is now, June 1893, very ill, and suffering apparently from phthisis.

General surroundings. Fairly satisfactory.

Summary. The child suffered from excessive inflammation of the arm and glandular enlargement in consequence of vaccination. The history of the case is very imperfect, and there is no definite evidence to show what was the actual duration of its illness. The family history is bad, and leads to the suspicion that some latent tubercular taint was roused to activity by the constitutional disturbance caused by the abnormal vaccination. Mr. Davidson now says that he was in error in giving a certificate of the cause of death as "pertussis ; convulsions."

(ix.) *Case 153.*

M. J. S., aged six months.

Vaccination. When four months old by Public Vaccinator (Dr. S., of ——).

Death. 26th May 1870.

Certified cause. "Tabes mesenterica."

Certified by. Mr. J. T. B., M.B.

Source of lymph. No record.

Vaccinifer. Not known.

Co- and sub-vaccinees. Not known.

Course of vaccination and illness. Mrs. S. made the following statement to Dr. B. and myself :—"The child was vaccinated on both arms, but "the vesicles did not form in the usual way, and about a "week after vaccination the wounds ran together and did "not subsequently heal. Scabs formed, and when they "were removed a large hole was found at the seat of each "puncture. Two or three weeks after vaccination an "eruption broke out all over the child's body which was "at first like pimples ; then matter formed in them, just "like small-pox. Scabs formed, and when they fell off "discoloured scars were left. An eruption next broke out "on the head, the eyes became affected ; there was a "purulent discharge from them, and the sight of one was "lost. . . . . The child lived for six or seven weeks. "The vaccination wounds were still open and the eruption "on the head not healed at the time of its death." Mrs. S. further states that her child was attended by Dr. B., and that he expressed the opinion that its illness and death were due to vaccination. Dr. B. assures me that this is incorrect, and that until he saw Mr. Davidson's statement it had not crossed his mind that the child's illness was due to vaccination ; he further states that the child had suffered from ophthalmia before vaccination, and was attended by Mr. P., assistant to Dr. S. I have been unable to trace Mr. P., who is unqualified. Dr. W., who is stated to have seen the child in consultation with Dr. B., has, he informs me, no recollection of having done so.

Previous history. Said to have been good.

Family history. Nothing of importance elicited.

There is no evidence to show that the child was exposed to the contagion of small-pox, or that she was the source of contagion to others.

The evidence in this case is very incomplete owing to the lapse of 23 years, and does not seem sufficient to warrant any certain conclusion as to the cause of the child's death. The mother's statement is clear and cannot be disregarded, and it is generally corroborated by the husband and (Mrs. G.) her sister. If the statement by Mr. P. that the child suffered from ophthalmia previous to vaccination is correct, it throws some doubt on the accuracy of Mrs. S.'s account of the child's illness, but does not throw any light on the cause of the child's death.

M. J. C.

October 1887.

2nd January 1888.

"Broncho-pneumonia."

Mr. P. M. Davidson.

Mr. Davidson's statement is as follows:—"*M. C.*, child "of P. C. ——. The mother states that the child would "have been seven years old now (July 1892) if alive. It "was strong and well before being vaccinated, but was "never well after, and died, and I told her so at the time, "in consequence of the vaccination. It was vaccinated "in 4 places. These places all ran into one big hole, "and a little over 3 months after being vaccinated it "died with the vaccination wound open, and mattering, "as it had done ever since it was vaccinated. The child "seemed to begin to waste soon after vaccination and "continued to do so to the end. I attended this child "and the mother's statement is quite true. The arm was "in a great hole down almost to the bone and never "ceased discharging. It died on January 2nd, 1888, and "I certified the cause of its death as broncho-pneumonia."

I have been unable to make any inquiries into the particulars of this case as the parents had removed from ——.

M. J. P.

Not stated.

10th August 1868.

"Diarrhœa, 2 days."

Not stated on the certificate.

Mr. Davidson wishes to withdraw this case on the ground that he is "anxious to avoid bringing forward any "case where there seems to be the least loophole for escape "from his conclusions."

The inquiry has in consequence not been pursued further.

THEODORE DYKE ACLAND, M.D.

CASE 156, REPORTED TO THE COMMISSION BY THE CORONER.

Case of R. S.: report to the Commission of Dr. Theodore Dyke Acland.

R. S., of ——, was vaccinated by Dr. G. F. S. A. on the 7th April 1892.

29th April 1892.

6th May 1892.

"Erysipelas, followed by convulsions."

According to the register direct from the arm of W. L., of ——.

W. L.; healthy up to time of vaccination and for eighteen days afterwards. Eleven days after the lymph was taken from her arm the child developed erysipelas. This seems undoubtedly to have been contracted from her mother, who began to suffer from erysipelas of the face on the 11th April, four days after the child R. S. was vaccinated.

Co-vaccinees.

According to the register, two; A. W. and A. W——e. Mrs. L., the mother of the child W. L., however, states that she believes that only one child was vaccinated from her baby's arm; and Mrs. S., the mother of R. S., the subject of this report, could not recognise Mrs. L. as the person from whose child hers was vaccinated.

The two children, A. W. and A. W——e, have been seen within the last week (May 1892) by Dr. G. F. S. A., the vaccinator, or his assistant, who found them in good health, and states that vaccination was normal without any sign of undue inflammation.

Sub-vaccinees.

None.

Course of vaccination and illness.

The evidence of the mother and of the doctors who attended the child during its illness is in substantial agreement. It is to the effect that the child suffered from erysipelas which spread over the extremities and trunk, disappearing in one place and extending in another up to the time of its death. Mrs. S., the mother of the child, and Mrs. S.'s mother, who nursed the baby, state that at ten o'clock on the morning following the vaccination—that is, about nineteen hours afterwards—they noticed redness at the points of inoculation. This continued to spread, and five days later a patch of inflammation about the size of a 5*s.* piece was noticed above the wrist. The vesicles formed and ruptured before the eighth day, and on the 15th April, when the child was seen at Dr. G. F. S. A.'s surgery, they were broken and discharging. There was at this time also a small abscess on the right side of the head above the ear. The erysipelas continued without substantial amelioration until the child's death, a few days previous to which it also suffered from convulsions.

Treatment of vesicles.

After the eighth day, when the child was first seen by the doctor, the arm was treated under medical advice.

Method of vaccination.

Dr. G. F. S. A. states that he is extremely particular about the instruments he uses for vaccination, that he never uses them for any other purpose, that they are kept in a drawer by themselves, and that before he uses his lancet for vaccination he disinfects it with perchloride of mercury. He also states that so far as he can remember on the day on which this child was vaccinated he did not attend any case of septicæmia, puerperal fever, foul discharge, or acute specific fever. He remembers attending only one case of erysipelas at this time, and his first visit to this case was made three days after the child was vaccinated. He says that so far as he knows no person with any contagious disorder was present in his surgery with the child on the day of its vaccination, although he readily admits that it is quite possible for some person so suffering to have been there without his knowledge.

It is a remarkable fact, if merely a coincidence, that Mrs. L., the mother of the vaccinifer, who on the 7th April (the date of R. S.'s vaccination) believed herself to be in good health, four days later sickened with erysipelas from which she suffered severely, and which a week later she communicated to her own infant, from whom the lymph had been taken on the 7th April. The most probable hypothesis seems to be that both Mrs. L. and the child R. S. came into contact with some common source of infection at Dr. G. F. S. A.'s surgery on the 7th April, the only occasion on which it is known that they met.

Post-mortem examination.

The post-mortem examination made by Dr. H. A——y threw little light on the cause of death. There were a few punctiform hæmorrhages from the superficial veins of the brain. There was some slight bronchial catarrh and some œdema of the vaccinated arm. From the history he had no doubt that the child died of erysipelas to which the convulsions were secondary.

Conclusion.

The child died of erysipelas spreading from the vaccination wounds. Whether the virus was inoculated at the time of vaccination or not, there is no evidence to show. But the fact that one other person present at the surgery on that day, who was neither vaccinated nor touched by any instrument used in the process of vaccination, is known to have suffered from erysipelas shortly afterwards makes it possible that the infection in both cases was contracted from the same source, viz., that of some person who was at Dr. G. F. S. A.'s surgery previous to or at the time of the vaccination on the 7th April. The fact that not one of the twelve children who came to be inspected on that day, and whose vesicles were opened subsequently, suffered from erysipelas, or even from excess of inflammation round the vesicles (they have all been seen by Dr. G. F. S. A. or his assistant) is, it is true, opposed to this view. It does not however, render it untenable, since all might not have come equally into contact with such source of infection. There does not seem to be any ground for supposing either that

the vaccination was carelessly performed, or that the vaccinifer was other than a proper source from which to take lymph.

A copy of the depositions taken at the inquest is appended.

THEODORE DYKE ACLAND, M.D.

(Copy of depositions taken at Inquest.)

Depositions of witnesses, produced, sworn and examined, this 6th day of May, One Thousand Eight Hundred and Ninety-two, at ——, before me, S. S., Esquire, Deputy for E. H., Esquire, Coroner of our Liege Lady the Queen, within the said City, touching the death of R. S., late of ——, daughter of L. J. W. S., a grinder, aged four months, there lying dead.

M. S. saith: Deceased was my daughter. She was a full-time, healthy child, and showed no sign of illness until the day after she was vaccinated. She was vaccinated on April 7th. Dr. G. F. S. A. vaccinated her. He did it from another child in my presence. The day after her arm appeared to be inflamed and five days afterwards a blotch about the size of a five-shilling piece came on her wrist. She seemed to be very ill, and on the eighth day I took her to Dr. G. F. S. A.'s and saw Dr. F. L. S., and he said it was going on first rate. She gradually got worse, and on Easter Monday, April 18th, she was very bad, and on the following day I took her to Dr. G. F. S. A's. again and saw Dr. F. L. S. again, and my mother said to him that she thought deceased had erysipelas, and he gave me a powder and a lotion. I did as he directed, and on the following Friday I took her to Dr. G. F. S. A.'s and Dr G. F. S. A. himself saw her. He ordered the treatment to be continued. Deceased continued to be very poorly, and on the following Thursday Dr. G. F. S. A. called and saw her, and on Friday Dr. F. L. S. called and gave me some medicine. The arm was very much inflamed and she could not lift it. She had convulsions all that week, and on Friday night she had a very bad fit and never recovered, and died the following morning. This is the first child I have lost. I have four living, and I think they are healthy children. About five days after she was vaccinated I noticed an abscess on her head just over her right ear. Dr. G. F. S. A. lanced it on Friday in Easter week. She had a bit of a cough from the time she was vaccinated. Deceased was vaccinated in four places. Her arm did not get rubbed. Her arm began to run the day after I took her to Dr. F. L. S. on the eighth day.

M. × S.

M. A. S., of ——, saith: Deceased's father is my eldest son. I saw deceased after she was vaccinated, and on the same day she was apparently quite well. I saw her again before 10 a.m. the following day, I then noticed that the arm was quite red all round where the cuts were, I thought it very unusual. At night the arm was worse and was about as I should have expected on the fourth day. I did nothing for it. Deceased got very cross and tiresome. It got gradually worse, and on the fifth day I noticed a patch of inflammation above her wrist and I thought it was erysipelas, and that it was a very bad case. I think the sores began to run about the sixth day. About the eighth day they began to dry up. The arm from the shoulder to the elbow was very much inflamed.

M. A. S.

M. B., of ——, saith: I first saw deceased on the fourth day. The pocks were all running then and the arm was inflamed.

M. × B.

G. F. S. A., surgeon, of ——, saith: I vaccinated deceased on April 7th. I got the lymph from Mrs. L.'s child at my surgery. She lives at ——. I always tell the mothers not to let the sores get rubbed. I next saw deceased about eight days afterwards. There was a little redness about the wrist and about the face but the vaccinated marks looked healthy. The child had a little cough and was breathing quickly. I ordered a little lead lotion to be applied wherever the redness appeared. I did not see her again until two days before her death. She was breathing very rapidly, but the marks were still healthy. All along the back of the neck and the left side of the face were inflamed, but there was very little swelling about the arm and shoulder, but there was a little at the back of the left hand. She also showed signs of convulsions by twitching her hands. Her breathing was also between 60 and 70 a minute. I have no doubt the child had erysipelas from the commencement. I disinfect the instruments with perchloride of mercury. I never use the instruments for any purpose except for vaccination. Since the death I have seen fourteen children vaccinated this week before deceased and two others vaccinated the same day, and from the same lymph. They are all quite well.

G. F. S. A.

F. L. S., M.D., saith: I am an assistant to Drs. G. and G. F. S. A. I was present when deceased was vaccinated. I think deceased had erysipelas.

F. L. S.

H. A——y, of ——, saith: I am Physician to the Children's Hospital. I have made an examination of the body of deceased yesterday. The child was about four months old. It was fairly well nourished. The eyes were sunken as if the child had suffered from an acute illness. There were four scabs on the left arm, the usual seat of vaccination. On removing the scabs I found the skin red and shiny. The lower part of the arm above and below the wrist was . The scalp at the back of the head and the back and the buttocks were red and from post-mortem changes probably. Internally I found evidence of bronchial catarrh. The lungs were healthy. The brain was , and a number of small bleedings had taken place from the veins on the surface. There were no important changes, and there was nothing abnormal about the other organs. The cause of death was, I think, convulsions. Having heard the clinical history, I am of opinion that the convulsions were due to erysipelas. The bronchitis was not sufficient to cause death.

H. A——y.

E. A. L., of ——, saith: My baby was vaccinated by Dr. G. on March 31st. She was then very well, and I took her on the 7th April and Dr. G. F. S. A. saw her. I saw no sign of erysipelas. In the week after I began to be ill from erysipelas, and I was attended by Dr. W. and about a week afterwards the baby began to have it."

E. A. L.

Severally sworn before S. S., Deputy Coroner.

CASE 157, REPORTED TO THE COMMISSION BY THE CORONER.

Case of R. A. M.: report to the Commission of Dr. Thomas Barlow.

At the request of the Commission I attended the Coroner's inquest on the child R. A. M., held on the 6th May 1892, at ——, and I made a post-mortem examination on the body of the above child in company with Dr. H. J. O'B. The following is the report of the post-mortem examination:—

Body extremely emaciated. No signs of violence. There are two vaccination scars one-third of an inch in diameter on the left shoulder; there are no gland swellings and no signs of abscess. There is a little œdema of both feet. The heart, lungs, liver, kidneys, and spleen are natural. The stomach contains much unhealthy mucous, and the small intestines are full of slimy green mucous. The Peyer's patches of the small bowel are somewhat enlarged. The appearances found are in favour of muco-enteritis being the cause of death. The condition of the vaccination cicatrices is not compatible with any deep ulceration, and there is nothing in the body pointing to any septicæmia from vaccination.

I append the depositions taken at the Coroner's inquest with the mother's statement as to the history of the child. I find it difficult to understand her statements as to inflammation of the arm after vaccination in the absence of any indications at the post-mortem pointing to past ulceration; but I observe that two previous children, according to her statement, were still-born, and that this child when

born was small, and furthermore that it had suffered from intestinal troubles, and had been fed on nursery biscuits and eggs, which was unsuitable food for a child of that age. The mother states that during the last two months before its death worm powders had been given to it. It is probable that the muco-enteritis, of which evidence was found in the post-mortem, was of some weeks' duration. The swelling of the ankles found in the post-mortem was in favour of lowered nutrition from such a cause as the above.

THOMAS BARLOW, M.D.

(*Copy of depositions taken at Inquest.*)

The Informations of Witnesses severally taken and acknowledged on behalf of our Sovereign Lady the Queen, touching the death of R. A. M., at ——, on the Sixth day of May in the year of our Lord One Thousand Eight Hundred and Ninety-two before me, W. E. B., Esquire, one of Her Majesty's Coroners for ——, on an Inquisition then and there taken on view of the body of the said R. A. M. then and there lying dead.

H. J. O'B., having been sworn upon the day and year and at the place above mentioned, deposed as follows:

I reside at ——. I am L.R.C.S. and registered. I was called to see the deceased on Wednesday, May 4th, about 12.30 p.m. My assistant went and found her dead. I followed and examined the body. No marks of violence. Body extremely emaciated. I have made a post-mortem examination this morning with Dr. Barlow.

Lungs—healthy, anæmie.
Heart—healthy.
Liver—congested.
Stomach—full of unhealthy mucous, as also the
Bowels—full of slimy green mucous.
Glands—enlarged—some sign of bowel disorder.
Kidney and Spleen—healthy.

There were scars like vaccination marks on the left shoulder. No other marks whatever except a bluish mark (possibly post-mortem) on the lower and back portions of the left leg. In my opinion vaccination had very little to do with the cause of death. In my opinion the cause of death was muco-enteritis. No appearance of blood-poisoning.

E. M. upon her Oath saith:

I reside at ——. I am the wife of R. M., a builder's labourer. The deceased was my daughter. Her name was R. A. M.; her age was seven months. She was a small but healthy child when born. She was full timed. When she was born I resided at ——. When she was three months and two weeks old she was vaccinated by Dr. L.'s assistant, Dr. O. He vaccinated her in two places on her left arm. He told me that two marks were sufficient, and I said to my husband when I got home that she ought not to have been done. I said so because the doctor remarked, "What a little mite!" I should not have taken her at all if it had not been for my husband pressing me to do so. It came out in four or five places besides the two marks on her arm. These marks reached nearly to the elbow; some were close to the vaccination marks on her arm. They looked something like the vaccination marks. No matter discharged from them. The scabs of the vaccination marks dropped off after four or five weeks, but the other marks continued quite two months, and then scabs came from them. She gradually began to pine away; she ate well, but was troubled dreadfully with worms. I fed her with the breast, new-laid eggs, and nursery biscuits. She was very ravenous. I did not have a doctor to her, but for the last two months I gave her worm powders. She did not suffer with worms before she was vaccinated. I believe it was the vaccination that was the cause of her wasting; she did not begin to pine away until after she was vaccinated. On Wednesday, 4th May, I left her in bed about 10.30 a.m. I then had no reason to expect her death. I went to pick her up about 12.30 p.m., when I found she looked strange. Her eyes were fixed, her hands were not clenched, legs not drawn up; she was just dying. I took her into the back room, and called a Mrs. S., who lives in the same house. I put her into a warm bath and rubbed her well, and gave her some brandy and sugar. She then drew a heavy breath and opened her eyes. I sent for Dr. O'B., but she died before his assistant's arrival about 15 minutes afterwards. I have had five children, two now living; no inquests before. She has met with no injury that I know of. Her life is not insured, and no one benefits by her death. The other children were still-born. They were my first and second, both six months' children. The child was vaccinated at the station at ——.

E. S. upon her Oath saith:

I live at ——. I am the wife of C. S., a ship's cook. I was called to see the deceased on Wednesday, May 4th, about 12.30 p.m. I found her in the mother's arms; she was dying. I got a warm bath, in which she was put, and some brandy and sugar was given her, and she seemed to revive for a minute. Dr. O'B was sent for, but she died before his assistant's arrival. He came at once. There were no signs of convulsions when I put it in the bath. There were no signs of life except an occasional sigh. The deceased and the parents had been living in my house for two months (5th March they came). I saw it a week after they came. It was very thin, and I advised the mother to take it to the Children's Hospital. She did not do so. I don't know why. I then told her she ought to take it to a doctor, and that I was sure she would find it dead some day, but she did not do so. She said the child had been vaccinated, and the doctor would only do it in two places instead of four. She also said that she had two breaking out below the vaccination marks. I saw four marks; they were then only scars like burns.

CASE 158, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of M. E. W. An inquiry was made into this case by a Medical Inspector of the Local Government Board. The following is an abstract of his report:

Local registrar's register contains entry of death, on the 5th May 1892, of M. E. W., aged seven months, certified by Dr. E., as from "Vaccinia, sixteen days; scarlatina, "four days; convulsions, one day." Dr. Fletcher was directed to investigate this case and reports to the following effect:—

An inspection of the Public Vaccinator's register shows that the deceased was vaccinated on the 18th April from M. N. R. E., aged five months.

From the same child, and on the same day, Dr. E. vaccinated E. T. O., aged one year and five months, and on the 4th May he vaccinated, from tubes taken from the same vaccinifer, E. J., aged one year and two months, and A. J., aged eleven months. Thus it appears that four children have been vaccinated from M. N. R. E., of whom one, the subject of this inquiry, subsequently died.

On June 29th Dr. Fletcher inspected the vaccinifer M. N. R. E., and found her to be a very fine healthy child. She had six good cicatrices, and her mother stated that the child had done well throughout.

On the same day he visited the three surviving children who were vaccinated from the child M. N. R. E.

E. T. O. he found to be a healthy-looking, strong child with six good cicatrices. He did well throughout.

E. J. appeared to be a strong, healthy, country child. He had been vaccinated in three places, and presented three small cicatrices. His mother said he had not been ill subsequent to the operation.

A. J. Dr. Fletcher describes as a healthy child with six good cicatrices. She had been quite well from the time of her vaccination.

On the same day Dr. Fletcher also visited the mother of the deceased child, and from her obtained the following information:—

An elder sister of M. E. W. (the subject of the present inquiry) was taken ill on the "Saturday but one" after M. E. W. was vaccinated; this would be on April 30th. On the following day she had a rash, pronounced by the doctor to be that of scarlet fever. Up to this time M. E. W. had been doing well, but on this same Sunday, May 1st,

her arm became red and shiny at the points of inoculation. The following day Mrs. E. took the child to the doctor's house, but he was not at home and did not see her till the day after, May 3rd, when she had a slight rash. The abnormal appearance noticed on May 1st had by this time spread, involving the whole of the vaccinated arm. No sloughing was observed. The child became worse and died early on the morning of Thursday, May 5th, and the elder child died on May 7th.

The elder child was in the habit of attending school, and did so up to four days before her illness. On inspecting the children in attendance at the school after her death, Dr. E., who is also the Medical Officer of Health, found a child who was desquamating, and who, he thought, had in all probability carried the infection.

The school was at once closed, but no disinfecting or cleaning took place prior to its opening.

The Public Vaccinator's lancet, which he states he kept solely for vaccination, was clean when seen by Dr. Fletcher.

On April 25th, when Dr. E. inspected M. E. W.'s arm, it appeared to be running a perfectly normal course.

Case 159, reported to the Commission by the Local Government Board.

Case of C. H. J. An inquiry was made into this case by a Medical Inspector of the Local Government Board. The following is an abstract of his report:

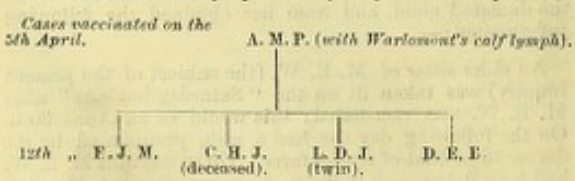
Local registrar's register contains entry of death on the 5th May 1892 of C. H. J., aged seven months, certified by Dr. W. as from "axillary abscess (following vaccina-" tion), ten days; exhaustion." Mr. Sweeting was directed to investigate this case and reports to the following effect:—

The mother of the child stated that the deceased was vaccinated at Dr. W.'s surgery on Tuesday, the 12th April. Vaccination took in three of the four places on the left arm in which it was done; on April 19th they were seen by Dr. W. Everything went on nicely until Sunday, the 24th, when she noticed a hard lump in the left armpit. She took the child to Dr. W., who ordered poultices to the lump and to the vaccination places. After this poulticing, the vaccination crusts which had now formed fell off. No other application was made to the arm. The hard lump got softer and soon an abscess formed. This was opened by Dr. W. about a week before the child's death on the 5th May.

Deceased, she said, was one of twins, the other, a female, being much the stronger. He (deceased) had "inflamma-" tion of the bowels" twice before vaccination. The other twin also had a small abscess in the left armpit after vaccination, which was lanced; she soon recovered. Besides the twins, two other children of hers had suffered from abscesses, and all of them had swellings of the glands from time to time.

Dr. W., who is a Public Vaccinator in another Union, stated that the twin children were brought to him to be vaccinated at his public station on the 12th April. He vaccinated the deceased in four places on the left arm with an ordinary lancet. On the 19th April he inspected the arm; three of the four places had taken, and there was nothing at all abnormal. On the 24th April the child was brought to him with an enlarged gland in the left axilla. He ordered poultices for this. An abscess formed in the axilla, which he opened on the 29th April. He last saw the child on the 2nd May, death ensued on the 5th May. The other twin had a similar, though less extensive and severe abscess, which subsided after being opened.

From Dr. W.'s register Mr. Sweeting found that the deceased was vaccinated on the 12th April from A. M. P., aged six months (who was herself done from Warlomont's calf lymph on the 5th April), along with:—(i.) E. J. M., aged eleven months, (ii.) D. E. B., aged six months, and (iii.) L. D. J., aged six months, the twin. There were no sub-vaccinees. The lymph history may be thus expressed.



Mr. Sweeting was unable to see E. J. M., who was away from home, but found from the register that vaccination had been successful in two places.

A. M. P., the vaccinifer, was an especially fine healthy child, who showed four normal scars.

L. D. J. (twin) showed altogether six normal scars (two the result, Dr. W. stated, of auto-inoculation); there was also a small scar in the axilla, the result of the incision.

D. E. B. showed four normal scars.

With the exception of L. D. J. (twin), none had suffered any ill effects from the vaccination at all.

Mr. Sweeting found the house and premises (a farm) where the deceased lived in an extremely unclean condition. The floors were damp, the roofing defective, refuse of all description (animal and vegetable) and household slops lying about at the back of the house. The privy pit is close to the house, and full of reeking, offensive contents. Altogether, he regards the sanitary circumstances of the cottage as below the average of even a bad country district. The mother, too, seemed a very uncleanly woman.

Case 160, reported to the Commission by the Local Government Board.

Case of W. H. G. An inquiry was made into this case by a Medical Inspector of the Local Government Board. The following is an abstract of his report:—

Local registrar's register contains entry of death on the 6th May 1892 of W. H. G., aged two months, certified by Dr. J. as from "Vaccination, eleven days; diarrhœa and " vomiting, four days." Mr. Sweeting was directed to investigate this case and reports to the following effect:—

The mother of the deceased, a flabby, anæmic young woman of 20, stated that deceased was the first child, and born on the 25th February 1892. He was a fine healthy child, but had "thrush" when a week old. On April 26th he was vaccinated by Dr. H. (their private medical man) at his surgery. This was done in three places on the left arm by cross scratches with a lancet, the lymph being rubbed in from ivory points previously moistened in cold water. All three places took nicely, except that the arm looked rather darker than she had seen other arms look; but on the eighth day after vaccination Dr. H. pronounced the vaccination quite satisfactory. He then opened all vesicles with a lancet and filled some "glass tubes" with them. The same night (3rd May) greenish-yellow diarrhœa set in. On the 4th May vomiting began. She got some stuff from the chemist this day to check the diarrhœa and vomiting. Mr. Sweeting saw the remains of this; it looked and smelt like chalk and cinnamon; it succeeded in allaying the former. The diarrhœa was thought by the mother to have been controlled by it. On the 5th May Dr. J. was sent for in supersession of Dr. H., who had vaccinated the baby, and was indeed usually their attendant. There had been some dissatisfaction with Dr. H. on account of not having called sufficiently often after Mrs. G.'s confinement. Dr. J., the mother stated, at once said that the child was "blood-poisoned." He saw the deceased three times and prescribed various remedies, but without success, for the child died at mid-day on the 6th May. The vomiting went on almost continuously up to death, but the diarrhœa ceased some hours before. The "head " was sunk in," and the body greatly emaciated before death. As to the vaccinated arm, three scabs had formed at the time of death; but beyond a little "hardness" around them they seemed quite the usual thing.

Dr. J., who practises homœopathy, stated that he was called in to see the deceased on the 5th May. The child was then moribund, the fontanelles sunken, the body emaciated, severe and continuous vomiting present. There was also a little diarrhœa, and the stools were offensive. There was a history of diarrhœa and persistent vomiting since the 3rd May. On the 4th May the mother had obtained some medicine from the chemist, which partially checked the diarrhœa. He was informed that the child had been vaccinated on the 26th April by Dr. H., and that on the 3rd May lymph had been taken from the arm. The arm looked healthy, except that there appeared to be some thickening of the skin around the scabs. Besides various homœopathic medicines, he ordered at once Anglo-Swiss condensed milk for the child, who, however, died on the 6th May. An autopsy was made, but nothing definite was found. Dr. J. cut out a piece of the skin for half an

inch around the vaccination scabs, and sent it for examination to a friend of his, Dr. C. The latter found nothing syphilitic about the specimen. Dr. J.'s opinion was that the surgical fact of vaccination had excited constitutional irritation, which set up the diarrhœa and vomiting. The vaccination process he regarded as quite normal, and he had no reason to suspect the lymph as being impure. Dr. J. asserted that he was not opposed to vaccination, and practised it among his patients.

Dr. H., a private practitioner, stated that he vaccinated the deceased on the 26th April in three places on the left arm with an ordinary lancet, scarifying by cross incisions. He used lymph stored on ivory points, taken from a child named A., aged three months, on April 11th. He re-vaccinated, at about the same time and with the same lymph a boy named Y., aged 14 years, and a baby W., aged three months. On the 3rd May he inspected W. H. G.'s vaccination at his surgery and found three large normal vesicles. There was no abnormal inflammation around the arm. He opened all three vesicles with the lancet, and filled six capillary tubes with the lymph from them. These tubes had not been subsequently used; their contents appeared normal, though rather opaque, on the day (7th June) that Mr. Sweeting saw them. Dr. H. did not see the child after the inspection on the eighth day (3rd May); but he had a letter from Dr. J. informing him of the child's death.

Mr. Sweeting saw 27 remaining charged ivory points from the vaccinifer A., taken from that child on the 11th April, and used for the deceased, for Y., and for W. They were charged on both sides and kept in a clean bottle; they appeared free from contamination. Dr. H. is in the habit of using points a second time, but only after boiling them for five minutes. His lancet was clean and in good condition.

Mr. Sweeting also saw the vaccinifer A., who showed six normal scars, two of them very small; no ill effect had ensued after vaccination.

Y., the re-vaccination, a boy at the Grammar School, was well and healthy, and showed a faint stain where the re-vaccination had been performed. Similarly, W., the other co-vaccinee, a very fine baby, showed one normal largish scar, and was in every way well.

The house of deceased is an old-fashioned one and badly arranged. The ground floor contains an eating-shop in front, the kitchen and sitting room behind, all very cramped. The first floor has a photographic studio, with workroom attached. The second floor two attic bedrooms, very close, cramped, and dark. The only occupants of the house besides the parents of the deceased are Mr. G.'s father and mother. The w.c. is indoors, opening directly into the workroom.

The child had been entirely bottle-fed. The mother gave him four bottles a day of an equal mixture of milk and water, to which breadcrumbs were often added. Altogether he had usually about two pints daily.

It might be added that the father is an excitable man of about 26 years, who has been confined in an asylum for nine months for acute mania, produced by alcoholic excess. After the child's death he addressed a strong letter to the local paper attacking vaccination.

Mr. Sweeting concludes by pointing out that diarrhœa is practically endemic in the town (of some 60,000 inhabitants) in which deceased had lived. During the period January, 1st to April 21st, 1892, there have been (according to the Medical Officer of Health) 14 deaths in the Urban Sanitary District from infantile diarrhœa and allied diseases (such as "gastro-enteritis," "cholera infantum," &c.) included under this heading by Dr. Ballard in his Diarrhœa Report. Of these, four (occurring in January and March) were quite close to the home of deceased.

Case 161, reported to the Commission by Mr. J. H. Lynn.

Case of P. P.: report to the Commission of Dr. Theodore Dyke Acland.

P. P., of——, was vaccinated by Dr. M., of——, Public Vaccinator, at Mr. M——y's station in——, on the 13th April 1892.

Cellulitis; abscesses.

Source of lymph. Vaccinifer.

Direct from the arm of V. W., of——.

V. W. is a well-cared-for, healthy-looking child in whom vaccination pursued a normal course, without any inflammation round the vesicles, general eruption, or enlargement of glands. He is the youngest of two children, the eldest of whom looks well and healthy. The father and mother appear also to be healthy.

Co-vaccinees.

Four; Nos. 43, 44, 46, and 47 in the register.

(i.) L. Y. (No. 43), of——. Vaccination normal. No eruption, no excessive inflammation, no enlargement of glands. Four healthy cicatrices; the child looks well and healthy.

(ii.) G. C. (No. 44), of——. Vaccination normal. No eruption, no excessive inflammation, no enlargement of glands. Four healty cicatrices; the child looks well and healthy.

(iii.) E. J. (No. 46), of ——, formerly of ——. The child is evidently greatly neglected. It is filthily dirty, and when seen had been left alone in the room without anybody to care for it, the mother having been out for some time. There are three fairly normal cicatrices, one scar still unhealed. The sleeve, which is irritating it, is saturated with pus and dirt. There is one small ulcer on the child's leg. Considering the neglected condition of the child its nutrition is fairly good.

(iv.) P. S. (No. 47). Vaccination normal; no inflammation, no enlargement of glands, no general eruption. There are three healthy cicatrices and one adherent scab. The child is said to be in good health, but looks rather anæmic.

Sub-vaccinees.

Two; Nos. 57 and 58.

(i.) J. J. C. (No. 57), of——. Vaccination normal. No enlargement of glands, no eruption on body, no excessive inflammation. There are four healthy cicatrices; the child is well nourished and healthy.

(ii.) W. K. (No. 58). Cicatrisation has been much delayed owing to the irritation of the scabs. The mother acknowledges that they have been knocked off three times, as she says that the children are so careless when they nurse it. There is now one healthy scar and three eczematous scabs. There is a small patch of eczema on the dorsum of the left scapula. The child looks fairly well nourished and is cheery; but the house is sickeningly close and dirty. Considering the conditions under which the child lives and the want of care which has been exercised in the treatment of the vesicles, it is wonderful that the child's arm is as well as it is. The father five weeks ago was sent to the ——Fever Hospital; the exact nature of his illness I was unable to ascertain.

Course of vaccination and illness.

Mrs. P., the mother of the child P. P., informs me that vaccination pursued a normal course until Friday, the 22nd April, two days after the lymph had been removed from the vesicles for the purpose of vaccinating Nos. 57 and 58. In accordance with instructions given her by Dr. M. when he opened the vesicles, she had applied lukewarm bread poultices to the arm. On the 23rd (the tenth day) Mrs. P. states the arm was inflamed between the vesicles, but not round them; it does not appear that up to this time there was any excessive inflammation.

On Saturday, the 23rd April, inflammation commenced to spread round the vesicles, and by Monday it had extended from shoulder to elbow. The child was seen on the Sunday by Mr. M——y, who informs me that he had no doubt that it was then suffering from erysipelas, and he referred the case to Dr. M., who had performed the vaccination. On Wednesday, the 27th April, the child was taken to St. Thomas's Hospital and admitted into the female erysipelas ward under the care of Sir William MacCormac. By this time the inflammation had spread to the fingers and to the trunk, and it has since extended to the right leg. An abscess has been opened in the left axilla and an incision made in the right leg to relieve tension, and the child now (7th June 1892) is convalescent.

Treatment of vesicles.

As far as is known, the vesicles were not injured or rubbed in any way, but, as stated above, after they had been opened they were poulticed. No shield was used and no application was made to the arm except under medical advice.

Previous history.

Nothing of importance elicited.

Family History.

Mrs. P. informs me that about ten days after P. P. was vaccinated she suffered from a sore throat, and that another child, F., also suffered in the same way and was taken to see Dr. R. C. as an out-patient at St. Thomas's Hospital

on the 1st May. From the entry in Dr. R. C.'s out-patient book it seems certain that she was mistaken in this date, for on the 23rd April there is an entry, "F. P.; disease, "scarlet-fever." Owing to the notes having been mislaid I have been unable to obtain any details of the case or to find out what evidence was relied upon for believing that the child was suffering from scarlet fever. Dr. R. C. informs me that he does not remember the child, and no application was made to the steward's office to remove the child to a Fever Hospital. No further information on this point can be obtained.

Sanitary surroundings.

The house is dirty and close, but I was unable to detect any offensive drain. There did not seem to be any communication between the rooms occupied by Mrs. P. and the drains outside. All the washing water is poured into an open gulley in front of the house, and all the house slops into the back one. The closet seemed sweet and in good order and ventilated into the open air.

There were in the house six children and six adults, but as far as I could ascertain, with the exception of the sore throats from which the mother and F. P. had suffered, there had been no illness.

Conclusion.

P. P. suffered from cellulitis of the arm and leg spreading from the vaccination wounds. Whether the cellulitis was the direct result of the vaccination or due to some accidental contamination of the wound there is no evidence to show. It is, however, a noticeable fact that Mrs. P. was suffering from sore throat, and P. P.'s sister F. (according to Dr. R. C.'s out-patient register) from scarlet fever on the days *immediately* preceding the first sign of cellulitis of the vaccinated arm; and it is obvious that the child P. P. must have been exposed to the same infection, as he was intimately brought into contact both with his mother and sister.

THEODORE DYKE ACLAND, M.D.

CASE 162, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of J. W. An inquiry into this case was made by a Medical Inspector of the Local Government Board. The following is an abstract of his report:

Local registrar's register contains entry of death, on the 12th May 1892, of J. W., aged three months, certified by Mr. T. as from "exhaustion and debility, the result of "inflammation and deep ulceration after vaccination, one "month seven days." Dr. Copeman was directed to investigate this case, and reports to the following effect:—

Mr. T., Public Vaccinator, who had signed the certificate of death, stated that, previous to the birth of the child in question, he had been engaged to attend Mrs. W., the mother of the child, in her confinement. Having been from home, however, when summoned to Mrs. W., in February, some other medical man was asked by the woman's husband to take charge of the case. Mr. T. stated that he had no further communication with the W.'s until the 11th May (an interval of about three months), when a Mrs. R., one of his club patients and a sister of Mrs. W., told him that the latter was staying at her house with a baby which was very ill and needed his attention. On calling at the house he found that the child was very ill indeed, and apparently at the point of death, and he noticed that the left arm was red and swollen from the shoulder to the elbow, while on the upper part of the arm, at a spot where, as the mother informed him, the child had been vaccinated nearly a month before, he found a shallow moist ulcer about the size of a shilling. There was, he said, no swelling of any other part of the body, no pneumonia, and no evidence of any disorder whatever. He stated, however, that the mother told him the child had been very weakly from birth. He did not, according to his own account, inquire by whom the child had been vaccinated, and it did not occur to him, he said, to do so and to inform the vaccinator of the critical state of the child. On calling again at Mrs. R.'s house next morning (May 12th) he found the child in much the same state as on the previous morning, the swelling of the arm having neither diminished nor increased. He had ordered a poultice to be applied to the arm but he did not ascertain on his second visit whether this had been done or not. He had not, he stated, attempted any further treatment. The same evening the child's aunt came to tell him of its death, when he certified as above. He had made no inquiries, he said, as to the manner in which the child's arm had become infected, but he thought that possibly the inflammation might have been due to irritation of the vaccine vesicle by the sleeve of a coloured dress.

Having learnt that the child J. W. had been vaccinated by a Dr. H., Dr. Copeman called on him also. He stated that he had attended Mrs. W. in her confinement, having been summoned by her husband in an emergency. He did not ask, he said, whether arrangements had previously been made with any other medical man. He said that the child when first born was cyanotic, but as later on it appeared, although somewhat undersized, to be in fair health he proceeded to vaccinate it on the 16th April at his own house. For this purpose he used, as he said, one of three tubes of calf lymph obtained a few days previously from Mr. L., a chemist in another town, who in turn had stated that his stock came from Dr. R., of ——. Dr. H. made one insertion only with a scarifier, which, when seen by Dr. Copeman, appeared fairly clean. The source of the lymph used on this occasion is unfortunately very obscure, the difficulty of tracing its origin being increased by the fact that Dr. H. keeps no accurate record of his vaccinations. Neither the chemist nor Dr. H. could give any further information, the latter stating that when he received the tubes they bore no number or other means of identification. On the eighth day (April 23rd) the child was, he said, brought to his house for inspection, when it appeared to be progressing normally. He opened the vesicle with a clean needle, and collected a small quantity of lymph, although why he had done so, he told Dr. Copeman, he did not know, as he never used human lymph for purposes of vaccination. From that day onwards, he said, he had never seen the child again, nor had he heard that it was dead or even ill until he received a communication on the subject from the Secretary to the Royal Commission on Vaccination.

Dr. Copeman learnt from Dr. H. that, shortly after her confinement, Mrs. W.'s husband was committed to prison, when she removed to a farm a little distance in the county, where a sister of hers was a servant. Here it was that Mr. T. saw the child. Between that date and the time of Dr. Copeman's visit, he found that she had again moved to a place called S., but was believed to be on the point of leaving, if indeed she had not already gone from, S.

After considerable trouble Dr. Copeman discovered the house where Mrs. W. was living with her sister, Mrs. R. It was not the house in which J. W. had died. Both house and inmates appeared unusually cleanly. Mrs. W.'s statement to Dr. Copeman agreed, he says, in the main with that of the two medical men he had previously seen, except that she said that Mr. T.'s first question on coming into the house was as to who had vaccinated the child. She said also that the child had remained apparently well until about a week after inspection, about which time the scab seemed to get a little larger. Four days before the child's death (viz., on the 8th May) she noticed that the arm was a good deal swollen. Previous to the arm becoming bad she had on several occasions applied to it a little cream obtained from the farm on each occasion. She said she had never used the same lot twice, and always scalded out the cup after use. On the 11th May, as the child was fretful and seemed ill, her sister called in Mr. T. He ordered a bread poultice, which was at once applied; but he did not suggest further treatment. It now refused all food, had several convulsions, and finally died on the evening of the 12th May. She added that the "coloured dress" mentioned by Mr. T. was made of blue flannelette which had been washed many times, the colour of which was therefore quite incapable of "running." She was unable to show it to Dr. Copeman as, on the death of her child, she had given it to a neighbour. She also stated of her own accord that she had tied up the sleeve so that the arm should not be rubbed, and although she could not say for certain that this had not taken place, she thought it was unlikely.

On Saturday, the 7th May, the child had, Dr. Copeman learnt, been taken out for some time, but he was unable to ascertain whether it had been brought into contact with any case of infectious disease or not. He found, indeed, from the records of the Medical Officer of Health for the Urban Sanitary Authority, that there had been a slight epidemic of measles in the town during April and May, and that two cases had occurred next door to the house in which the child was born, but, with this possible exception, Dr. Copeman was unable to trace any obvious source of infection.

Case 163, reported to the Commission by Mr. J. H. Lynn.

Case of E. A. D.: report to the Commission of Dr. Theodore Dyke Acland.

E. A. D., of ——, was vaccinated when about a month old by Dr. A. D., in September 1889.

Abscesses; necrosis of humerus.

Not known. Dr. A. D. has kept no record of the case and cannot remember whence he obtained the lymph.

No record.

No record; it is believed that there were none.

Vaccination was performed in one place on the *right* arm. After a searching inquiry from both father and mother, I have been unable to ascertain that the vaccination showed at any time any departure from the normal. Mrs. D., the mother, states that the arm was not unduly inflamed, that there was no swelling in the axilla and no rash upon the body, that the vesicles scabbed over quickly and firmly, and that there was no suppuration beneath the scab.

Mr. D., the father, does not profess to have any accurate knowledge of the course of events, and his statements, which he admits are not to be relied upon, do not coincide with those of his wife, who, he says, knows all about the child. As far as Mrs. D. knows, the vaccinated arm was quite well at least two months before any abnormal symptom manifested itself, and it was more than a year before the abscess formed on the vaccinated arm. About two months after the vaccinated arm had entirely healed, Mrs. D. states that she noticed a lump on the back of the *right thigh*, another on the left thigh, and another on the left forearm; and from the scars that are now present it would appear that there must have been one on the left buttock. The date of the first appearance of these lumps cannot be accurately fixed, but, as Mrs. D. says that the child was attended by Mr. C., and the first entry in Mr. C.'s case-book is the 20th September 1890, it seems probable that a considerably longer period than two months elapsed between the time of vaccination and the appearance of these inflammatory masses.

Mr. C. continued to attend the child throughout September, October, November, and December 1890, during which period he or Dr. K. opened two of these abscesses and evacuated pus. In December 1890 (*fifteen months* after vaccination) another abscess appeared just above the insertion of the right deltoid. It formed rapidly, and on the 7th December it was aspirated. On the 17th January 1891 the abscess was opened and a drainage tube inserted by Mr. C. The first appearance of this abscess was a small lump, which formed about an inch above the vaccination scar and the same distance below the tip of the shoulder. The vaccination scar itself was not interfered with, and Mrs. D., the mother, informs me that she is certain that the inflammation did not begin round or below it, that it never broke down, and that the inflammation which surrounded the abscess did not at any time reach or involve the place where vaccination had been performed. As far as Mrs. D. knows there has not been any alteration in the condition of the scar from the time it first completely healed after vaccination.

The abscesses in the left thigh and left forearm discharged and healed up; that in the right thigh did not suppurate and eventually subsided. The abscess over the upper part of the right arm has continued to discharge.

In *February* 1891 the child was taken to see Dr. R., of ——, who informs me that there was a sinus over the upper part of the humerus, leading down to a patch of bare bone. He saw the child twice only, the last occasion being on the 6th July 1891. He wished to open up the sinus and to attempt the removal of the bone, but the parents would not consent to this being done. Since this date the child has not been systematically under the care of any doctor.

When I saw the child on the 25th June 1892 I found the scars of the abscesses on the thigh and the left forearm. About one inch below the tip of the shoulder there is a deep sinus with healthy margins without granulations, the skin being completely healed. With a probe a small patch of bare bone was felt, the position being either at or just below the line of the epiphysis.

Having the opportunity of doing so, I took the child to see Mr. Edward Lund, Consulting Surgeon to the Manchester Royal Infirmary and Emeritus Professor of Surgery in Victoria University, who, with Mr. Herbert Lund and myself, examined the case. He is of opinion that there is a small patch of necrosed bone in the position indicated, but that there is no evidence that the shoulder joint is involved. Mr. Herbert Lund has consented to take the child into the Salford Hospital under his care with a view of removing the sequestrum.

The child's nutrition is good; but it has the appearance of being strumous. For some months it has suffered from a profuse purulent discharge from the right ear, and there is some enlargement of the cervical glands.

Method of vaccination. Not known.

Previous history. Nothing of importance elicited.

Family history. E. A. D. is the eldest child; there is one other, a baby, five months old, who seems to be well nourished and healthy. The mother, Mrs. D., is a delicate-looking woman; she says that she has lately been ill with congestion of the lungs and pleurisy. On examining her chest I found that there was disseminated tuberculosis on both upper and lower lobes of the right lung, with evidence of caseation. There is a considerable flattening under the right clavicle with prolonged expiratory murmur and frequent fine crepitus after coughing. She has lately been losing weight, and is now sweating at night. The only other member of the family who seems to have suffered from phthisis is her uncle. The father is a fairly healthy-looking man, and he says he has never ailed anything. He has a patch of sycosis on the upper lip on the left side.

General surroundings. Nothing of importance noted.

Sanitary condition. Nothing of importance noted.

Conclusion. I have in this case been unable to obtain any evidence that vaccination pursued other than a normal course; neither is there anything to show that the suppuration which subsequently took place was related to the previous vaccination. The family history is bad, the mother being in an advanced stage of consumption; and the only certain evidence goes to prove that a year had elapsed subsequent to the vaccination before the child was first taken to a doctor.

Addendum. The further progress of the case is given in the following letter from Mr. Herbert Lund:—

22, St. John Street, Manchester,
6th September 1892.

Dear Sir,

I explored the sinus in the case of E. A. D., and found a large cavity between the head and shaft of the humerus. The bridge connecting the head and shaft appeared so thin that I did not do much, but contented myself with scraping and sponging it with chloride of zinc. The child improved in general condition and the cavity was filling up gradually when the friends thought fit to take their child home! This was August 30th, and I have heard nothing since.

With kind regards,
Sincerely yours,
Herbert Lund.

Dr. Acland.

Theodore Dyke Acland, M.D.

Case 164, reported to the Commission by Mr. J. H. Lynn.

Case of G. S. D.: report to the Commission of Dr. Sidney Coupland.

Vaccination. G. S. D., born on the 19th February 1892, living at ——, was vaccinated at the vaccination station in the district of Dr. E. R., Public Vaccinator, on Wednesday, the 27th April 1892. The vaccinifer was a child named G. E. P., who had been vaccinated on the previous Wednesday, and who also furnished lymph for eight other children, four being direct (arm-to-arm) and five (including G. S. D.) from tubes charged just previously to their arrival at the station. The insertions were made in four places on the left arm, in the usual situation, and when inspected on the eighth day (the 4th May) by Dr. E. R. he found four typical vesicles with a slight areola. He opened the vesicles and charged seven tubes with lymph, which he has not (yet) used for any vaccinations.

Course of illness. Dr. E. R., who furnished me with the above information, further stated that the child was brought to the

station on the "16th day" (? 15th day) with the "vesicles "all in an ulcerated condition, no 'tops' visible, extensive "erythema, and swollen forearm." Dr. E. R. questioned the mother as to whether any poultices had been applied or vaccination shield worn; but she said that the only application had been some cold lotion applied to the arm on the 10th or 11th day, by direction of a chemist. Dr. E. R. dressed the ulcerated vesicles with boracic acid, applied iodine and belladonna to the forearm, which he bandaged. On visiting the child subsequently he found Mrs. D., the mother, suffering from an "ulcerated throat ". . . . for which she was applying whisky very "freely," and the infant was receiving very little attention. He continued his attendance on both mother and child, but complains that since the mother had been informed that the case was to be inquired into, there had "been some disposition . . . . to neglect my instructions." In proof of this he showed me two reports by his officers whom he had sent independently to call at the house on different days. Mr. F. B. wrote, under date the 27th May: "According to your request when on my round "to-day (Friday) I called on Mrs. D., at ——, and saw the "arm, but was surprised to find she had not kept the "bandage on as requested by you, and from the mother I "could not learn that anything in the matter of treatment "was being done." And Mr. J. B. wrote, under date the 28th May:—"As requested I visited Mrs. D., of ——, "to-day (Saturday). The child was brought down from "the bed to me. I found none of your directions for "treatment being carried out, neither did it appear to have "*had* any bandage on for some time."

Present condition. At the time of my visit (on the 29th May) I found the infant presenting a healthy appearance, and in a good state of nutrition. There were four recent vaccination marks on the left upper arm, but no evidence of any previous extensive or deep ulceration. The forearm was swollen by œdema from the elbow to the hand, the œdema being most marked on the dorsum of the hand, where the skin was red and shiny; but there was no heat of the part, nor any tenderness. The condition suggested some lymphatic obstruction, and possibly the formation of a small abscess on the dorsum of the hand. There was no bandage being worn, and the hand was not supported in any way.

Mother's account of child's illness. Mrs. D., the mother, informed me that the day after the vesicles had been opened, *i.e.*, on Thursday, the 5th May, some redness appeared over the upper part of the arm and the shoulder, extending to the root of the neck and across the chest. On Saturday, the 7th (or 11th day of vaccination), the infant seemed ill "in itself"; refused the breast; whilst the arm was red and swollen to the elbow. The scabs at the sites of vaccination had formed, but there does not appear to have been any evidence of ulceration at this time. On Sunday, the 8th, the child was worse; it was very feverish and fretful; the arm was swollen, red, and shiny, and "very hard," and the hand had now become swollen. She took the child to Mr. R., chemist, who gave her some lead lotion. She states that he remarked that the scabs were drying up very quickly. On the night of Monday, the 9th, the scabs became detached, and the sites appeared as "open sores," discharging matter which soon dried up again. On Wednesday, the 11th (*i.e.*, 15th day of vaccination), she took the child to the vaccination station to see Dr. E. R. There was then considerable swelling of the fingers and back of the hand, whilst the forearm was about twice the natural size. Dr. E. R. painted it with iodine from the fingers to the elbow, and applied a bandage. The swelling asted in the elbow until the 25th. The vaccinal sores did not increase in size; and the new scabs were removed by Dr. E. R. yesterday (28th May).

During my interview with Mrs. D. a neighbour (Mrs. M.) called, and confirmed the above statement, and particularly dwelt on the marked illness of the child on the 8th May, saying that it remained ill for about a fortnight.

The child had been perfectly healthy since its birth. Both Mrs. D. and Mrs. M. averred that nothing but a light handkerchief had been placed over the arm. A neighbour had lent the former a "shield" (which I saw, it was a rudely constructed wire framework), but it had never been applied.

On the 12th May Mrs. D. was taken ill with a headache and sore throat, and was seen and prescribed for by Dr. E. R. on the 14th. (It is highly probable that this may have been induced by her night and day attendance on her child.)

Family history. The father is 21 years of age, a spoon and fork filer, and a strong, healthy man. Mrs. D. herself is a healthy young woman, 20 years of age. They have two other children, whom I saw, namely, A. E., three years old, who has never been vaccinated, and A., eighteen months old, both healthy looking. The latter was vaccinated at the usual age by Dr. E. R., and the mother thinks she has got thinner since.

Dwelling. The dwelling is small and dry, but ill-kept. There is no through ventilation, and only two rooms, a bedroom above and a dwelling-room, containing a sink, on the ground floor. The sink is trapped. The closet (pail system) is at some distance from the house down the Court.

Vaccinifer. I called at the house of the vaccinifer, G. P., of ——, but her parents had taken her with them into the country for the day. I was informed by the neighbours that she was a very healthy child, and that her vaccination had given no trouble.

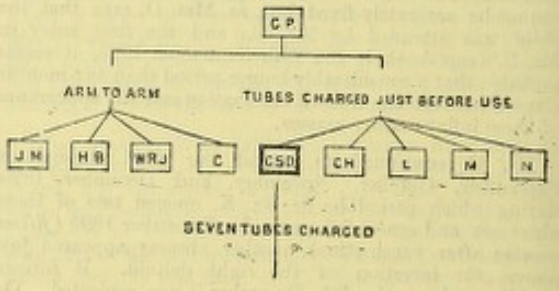
Co-vaccinees. I also saw three of the co-vaccinees of G. S. D., namely: (i.) W. R. J., aged eleven weeks, of ——, (ii.) J. M., aged two and a half months, of ——, and (iii.) H. B., aged four months, of ——.

(i.) W. R. J. is the second child of its parents, the first having died in infancy. He is being fed by hand and looks healthy. His arm presented four vaccination places, each with still adherent scabs; two of them were closely contiguous. Their aggregate area was about three-quarters to one square inch.

(ii.) J. M., a healthy child having four recent places on the arm, in one of which only was the scab adherent.

(iii.) H. B., a rather puny child, with three out of four scabs adherent.

There was no abnormal character about the vaccination in either of these cases, and Dr. E. R. assured me that each of the other co-vaccinees was doing perfectly well.



Summary. The case appears to be one, in its later history, of a somewhat unusual sequel to vaccination.

It did perfectly well until the vesicles were punctured. The following day there was some erythema spreading upwards from the sites of vaccination, and later downwards. At the same time the places themselves took on an unhealthy action. It does not appear from the mother's account that the ulcerations preceded the cutaneous inflammation. Nor was the local lesion at all severe; there is now hardly any evidence at the seat of vaccination of there having been undue ulceration there.

But, apparently, in consequence of the erysipelatous condition which afterwards spread to the forearm, there has been a persistent œdema of that part of the limb and of the hand. Indeed, the latter looks as if there may be some pus forming beneath the skin of the back of the hand. Whether this be so or not, the condition is obviously one which will shortly subside under care, and it may have persisted longer than necessary from neglect of the doctor's orders. [I ought to add that in a letter from Dr. E. R., the day after my visit, he says that the re-application of the bandage has been followed by a marked improvement.]

I presume that the œdema is due to lymphatic obstruction rather than venous; as there is no evidence of the latter. I may remark that at no time were any enlarged glands noticed in the axilla.

That the opened vesicles must have been infected from some extraneous source there can be little doubt; and that the vaccine itself is not to blame is sufficiently proved by the successful course taken by the eight co-vaccinees, and by the case of this infant itself up to the eighth day. Nor is it probable that it was infected at the time of puncture, since D. E. R. is a Public Vaccinator of 25 years' standing, fully conversant with all the details and precautions needful in vaccination and very successful in its practice. (I give,

in a note below,* a copy of his "instructions" to mothers respecting the after-treatment of their infants.) I can only infer that the inflammation was initiated by some contamination of the freshly punctured vesicles.

I add a chronological summary of the case. In Mr. Lynn's letter, informing the Commission of the case, the first date, that of the vaccination, is given as the 20th and not the 27th April. The latter is, however, according to Dr. E. R., the correct date :—

27th April 1892.—*Vaccinated with lymph from G. P.*
4th May 1892.—*Inspected; four good vesicles which were punctured, and seven tubes charged with lymph from them.*
5th May 1892.—*Redness over upper arm and shoulder, spreading to root of neck and across chest.*
7th May 1892.—*Extension of redness and swelling to elbow; scabs dry; child seems ill and refuses food.*
8th May 1892.—*Feverish; "very ill"; swelling of fore-arm and hand; lead lotion applied.*
9th May 1892.—*Scabs detached.*
11th May 1892.—*Seen by Dr. E. R.; shallow ulcers at vaccination sites; extensive erythema and swelling of forearm.*
29th May 1892.—"*Lymphatic œdema*" *of forearm and hand; child otherwise healthy and natural.*

SIDNEY COUPLAND, M.D.

CASE 165 [SERIES], REPORTED TO THE COMMISSION BY MR. J. H. LYNN.

Case of E. W. and V. E.: report to the Commission of Dr. Theodore Dyke Acland.

E. W. and V. E. were vaccinated by Mr. T. H. W., Public Vaccinator of ——, at the —— vaccination station on the 20th April 1892.

Calf lymph obtained from Dr. R. Two tubes were obtained at the same time. One of them was opened for a private vaccination on the 19th April, the remainder being stored on ivory points and used for the vaccination of E. W. and V. E. on the following day, the 20th April.

One other besides E. W. and V. E. Some doubt existed in Mr. T. H. W.'s mind as to which of two children, private cases, D. G. T. or P., had been vaccinated from the tube of lymph subsequently used for vaccinating E. W. and V. E. Mr. T. H. W. is certain that D. G. T. and P. were each vaccinated from a *fresh* tube of lymph; Mrs. T. is certain that her child was vaccinated on the 19th April, and Mrs. P. that hers was vaccinated on the 21st April. There can, therefore, practically be no doubt that E. W. and V. E., who were vaccinated on the 20th April, were vaccinated with the same lymph as the child D. G. T.

D. G. T., a well-nourished, typically healthy-looking child. The inflammation of the arm succeeding vaccination was severe, reaching from the shoulder to the elbow. The two lower vesicles coalesced, but vaccination was not followed by any glandular enlargement or general eruption on the body. The scabs came away naturally on the 31st May, six weeks after vaccination. The cicatrices were healthy.

[*Note.*—The infant P., vaccinated on the 21st April from the second tube of calf lymph, was vaccinated in three places. There was some slight inflammation round the points of inoculation and two of them coalesced, but the arm was well by the third week and there was no rash and no enlargement of glands. The child appeared typically healthy.]

Other vaccinations on 20th April.

Eight other children were vaccinated at the —— station on the 20th April. Of these eight, three (Nos. 180, 181, and 182 in the register) were vaccinated with stored lymph from No. 170, who had been vaccinated on the 12th April; and five (Nos. 183, 184, 185, 186, and 187) were vaccinated from a private case of Mr. T. H. W.'s named D. In order to ascertain as far as possible whether the excessive inflammation which occurred in the cases of E. W. and V. E. was due to the lymph or to the method of vaccination, or to some cause present in the surgery on the 20th April, I inspected all these children except H. (No. 180), who had been seen quite recently by Mr. T. H. W., and in whom vaccination had pursued a normal course. The others were :—

A. G. (No. 181). Vaccination normal. No eruption; no enlargement of glands; no excessive inflammation. Four healthy cicatrices. The wounds were healed by the middle of May.

J. G. (No. 182). Vaccination normal. Cicatrices healthy.

S. D. (No. 183). The vaccination wounds at the date of my visit, the 1st June, were still covered with two large scabs, the two upper and the two lower vesicles having coalesced. The arm had been frequently rubbed and the scabs injured, but notwithstanding this the child is in good condition and healthy. There is no general eruption, no enlargement of glands, and no eczema.

K. S. (No. 184). During the second week the child had an erythematous rash all over its body, but there was not much inflammation round the vesicles. There are three healthy cicatrices, two of which have coalesced into one. There was no enlargement of axillary glands. The scabs came off naturally about the 21st May, and the child is now in good health.

E. H. (No. 185). During the second week the inflammation extended from shoulder to elbow, but did not spread to the body. There was no enlargement of glands, but there was a pustular eruption during the second and third weeks, not lasting for many days. The vaccination wounds healed quickly and well, and had cicatrised by the first week in May. There are now three small irregular cicatrices, and the child is in good health.

W. E. E. (No. 186). Vaccination is said to have been normal although the four vesicles have coalesced, leaving one large irregular scar. The child has had no rash and no enlargement of glands. The arm was quite healed by the middle of May, and the child is now quite well.

Sub-vaccinees.

None.

Method of vaccination.

Vaccination was performed with a grooved, toothed instrument (a Weirs scarifier), which, when I saw it, did not seem to be in very first-rate condition. It is an instrument the use of which must be attended with a certain amount of risk, since it could only be kept clean by the most scrupulous care. The lymph used, as has been stated above, was taken from a freshly opened glass tube the day previous to its use for the vaccination of E. W. and V. E., and stored on points. It was mixed with glycerine, which tended to make it dry slowly. To allow for this Mr. T. H. W. attached the points to a small piece of wood, in which he had received the tubes, and then placed them in a tin box in which he kept his vaccination instruments. In this manner the points were carried about for 24 hours without any precaution for their protection.

Firstly, as to V. E.:

Course of V. E.'s vaccination and illness.

V. E., aged six months, was vaccinated on the 20th and inspected on the 27th April. Two or three days after vaccination the arm began to inflame and a considerable

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* "*Instructions to be observed during vaccination :—*

"*Prevent the vaccination being injured by the clothing of the child or the person who nurses it. This can be done by nursing the vaccinated arm away from the nurse's body, and keeping the arm covered with a piece of well-washed linen or a soft napkin.*

"*Do not use 'tie-ups' or 'vaccination shields.' Both are injurious, causing great suffering from the pressure on the surrounding blood-vessels or veins.*

"*Do not give the child any medicine unless ordered by a doctor. Diarrhœa requires immediate attention.*

"*The greatest care is required during the whole of the vaccination period that the child be not exposed to cold, or any disease such as sore throat, measles, or scarlet fever, the same particular care being required as if the child were suffering from bronchitis or any other illness.*

"*After the child has been inspected the same day in the following week, and the vaccination vesicles opened to remove the lymph, which is always necessary to prevent the child suffering more than is needful, nothing more is required to be done than keeping the part clean from any further discharge or dust, the arm to be kept dry free from cold, and rubbing as before stated.*

"*Do not on any account apply cream or milk. Both are very irritating by turning sour, and are apt to convey germs of disease to the vaccination, therefore dangerous.*

"*Do not apply Fuller's Earth, or any dust or poultices, or anything else, except a little zinc ointment, without advice from the doctor who vaccinated the child.*

"*If not well at the end of the next week following inspection, the child should be again taken to the doctor who vaccinated, for advice as to treatment. All vaccinated arms should be quite well in 21 days.*
"*E. R., M.D.,*
"*Public Vaccinator, ——.*"

abscess formed in the axilla, which burst. There was a great deal of discharge from the abscess but not much from the vaccination wounds, which, at the time of my visit on the 1st June 1892, were quite healed. The mother informs me that the scabs were rubbed, but not actually knocked off. The two lower vesicles coalesced. There could be no doubt but that the child had been seriously ill although it then looked bright and well. It had had no eruption and no enlargement of other glands. There are now three healthy scars, and a considerable sinus in the axilla surrounded by thickened and inflamed tissue.

Secondly, as to E. W.

Course of E. W.'s vaccination and illness. On the day of inspection Mr. T. H. W. noticed nothing abnormal in the appearance of the vesicles, but towards the end of the second week the arm became much inflamed and the inflammation spread rapidly. The child was put under medical treatment, since which time the sloughing which had commenced has entirely ceased, and there is now a deep healthy ulcer, nearly square, at the point where all the four vaccination vesicles have run into one. The edges are clean, not overhanging, and the base is even and covered with small granulations; the edge is cicatrizing rapidly. There is very little induration round the ulcer, but the tissues bear evidence of severe inflammation, and the skin was still, when I saw the child, dusky, and looked as if it had lost its vitality. There were a few minute papules at the back of the neck, which were first noticed during the second week after vaccination. There had been no great constitutional disturbance and the child looked, and was said to be, well.

Treatment of vesicles. Up to the time when the arm began to inflame no application of any kind was made to the vesicles which, as far as is known, were not rubbed nor injured in any way.

Previous history. Good.

Family history. E. W. is the third child, the first two having been stillborn. I was unable to elicit any circumstances in the family history bearing upon the case.

General surroundings. On the day of vaccination the mother came straight home without going into any shop or public-house, and, as far as she knows, she did not come in contact with any case of infectious disease. The cottage is detached, and there had been no illness of any kind in it or next door. It was very poor, but scrupulously clean, and there was no communication with any catchpit or cesspool in the house, although there is a small ditch running through the garden outside, into which the slops and refuse are thrown. This was freely open to the air, and there was no offensive smell from it. The privy is entirely separate from the house, and there was nothing in the sanitary condition of the house and surroundings which appeared specially likely to infect an open wound.

General summary. From the above facts it will be seen that, of all the vaccinations performed on the 20th April at the —— station, two only were characterised by severe inflammation round the vesicles. In some of the other cases the vesicles coalesced, but the history of these cases seem to show that this was probably due rather to the fact that the insertions were placed too near together than to excessive inflammation. In one case (S. D.) the healing of the wounds was delayed by injury to the scabs. The two children who suffered severely, E. W. and V. E., were vaccinated with calf lymph which had been opened the day previously and stored in a manner which can only be regarded as highly dangerous. The child, D. G. T., who was vaccinated with the same lymph when it was first opened, suffered from considerable inflammation. Taking all the circumstances into consideration, it seems probable that the bad results of the vaccinations in E. W. and V. E. were due to the use of lymph which had been opened and left exposed to the air for 24 hours before use. There is no evidence to show that the instrument used for the vaccinations contributed to this result, but, in consequence of what has taken place, Mr. T. H. W. has discarded its use and has obtained an ordinary lancet.

THEODORE DYKE ACLAND, M.D.

CASE 165, REPORTED TO THE COMMISSION BY MR. J. H. LYNN.

Case of A. G.: report to the Commission of Dr. Sidney Coupland.

A G., son of J. G., aged thirty-five years, bricklayer, and S. G., his wife, aged thirty-three, of ——, was born on the 15th January 1892, and vaccinated at the district vaccination station on the 9th of May 1892 by Dr. E. R., Public Vaccinator.

Source of lymph. Dr. E. R. reports that A. G. was vaccinated, together with five other children, from the arm of R. D. of ——

Vaccinifer. R. D., the vaccinifer, is one of a family of three healthy children, and has passed through a thoroughly normal vaccination.

A. G. was brought for inspection on the 16th May. The vesicles were then "in perfect condition," and the child was used as the vaccinifer for the infant, T. L. W., of a neighbour (Mrs. W. of ——). A. G.'s arm has "progressed very well."

When I saw A. G. on the 29th May (the twentieth day of vaccination) there were four sites of normal vaccination from which the scabs had been recently detached. Two of the places were united at their margins, but there was no evidence of any ulceration having taken place. I gathered from the mother that one or two pustules had formed in the vicinity of the vaccination sites; but there was no undue redness of the arm, and the child, although slightly fretful, never refused the breast.

Mrs. G., the mother, further stated that she had four other children, aged six, four, three, and two years respectively; that they were all healthy, and had been vaccinated in London, where she used to live; and that A. G.'s arm was no worse than theirs had been.

Her husband is opposed to vaccination himself; and his consent was obtained to the case being reported as one of injury by the gentleman who called to see it on the twelfth day, when Mrs. G. says "the arm was at its "worst."

Sub-vaccinee. I also saw the infant T. L. W., aged six weeks, who was vaccinated on the 16th May from the arm of A. G. The child, who had just had an attack of bronchitis, was in good condition and presented four good sized scabs with slight areola. Mrs. W. thought its vaccination had taken better than her other children's. These, three in number, had been vaccinated in ——. A fourth child, two years of age, has never been vaccinated, as it was suffering from abscesses in infancy.

Co-vaccinees. I saw one of the child A. G.'s co-vaccinees, namely, F. B., aged five months, of ——; a healthy child, presenting four good sized adherent scabs. There had been no trouble in this case nor in that of any of the other four co-vaccinees of A. G., whose names were D., S., L., and W.

Summary. From the appearance of the arm and from the history of the vaccination as furnished by Dr. E. R. and Mrs. G., the child's mother, I am unable to ascertain that anything abnormal has taken place in this case. It is quite possible that there may have been some slight surrounding erythema of a transitory nature, but there has certainly been nothing of such severity as to constitute the case one of "injury following vaccination."

SIDNEY COUPLAND, M.D.

CASE 167, REPORTED TO THE COMMISSION BY THE PUBLIC VACCINATOR.

Case of E. H.: report to the Commission of Dr. Theodore Dyke Acland.

Vaccination. E. H., of ——, was vaccinated, when three months old, by Mr. W. S., Public Vaccinator, on the 30th July 1891.

Death. 11th December 1892.

Certified cause. "Acute nephritis; anasarca."

Certified by. Mr. R. C. A., M.R.C.S.

Source of lymph. Direct from the arm of R. T. H.

Vaccinifer. R. T. H. (No. 382 in the register). A very dirty but apparently healthy child. Vaccination pursued a normal course without complication. There are four healthy scars, which are regular and show no signs of undue inflammation. R. T. H. is the sixth child; the others are all healthy. The mother has had no miscarriages. I was unable to find any reason why the child should not have been selected as vaccinifer.

Two; Nos. 384 and 385 in the register.

(i.) R. B., No. 384. A delicate-looking child. Vaccination normal without complication of any kind. There are four normal scars. The youngest of nine children, of whom six are alive. One died of bronchitis, and two (twins) survived only for three days.

(ii.) F. S., No. 386. A plump, rosy-looking child. Vaccination pursued a normal course without complication. The youngest of thirteen children, of whom eight are alive. Vaccination is stated to have pursued a normal course in all.

Four; Nos. 391, 394, 395, and 396. Vaccinated on the 6th August 1892 by Dr. McL., Superintendent of the —— Asylum, acting as deputy for the Public Vaccinator.

(i.) E. L., No. 391. A delicate child with granular lids. Vaccination normal, without complication. Three normal cicatrices. The child is now (30th December 1892) in better health than it was before vaccination. She is the youngest of eight children, in all of whom vaccination is stated to have been without complication.

(ii.) E. C., No. 394. A typically healthy child. Vaccination was normal. Four healthy cicatrices. She is the youngest of seven children, in all of whom vaccination pursued a normal course. One child died of bronchitis eight months after vaccination. The mother informs me that she attributed the fatal result to vaccination, because a bullous eruption appeared on the child's body subsequent to vaccination. As far as I could ascertain from her statement this eruption was pemphigus, and I was unable to trace any connexion between it and vaccination; it did not appear until one month after the vaccination wounds were entirely healed.

(iii.) J. E. S., No. 395. The family had removed to London. I am informed by Mrs. L., a neighbour, that at the time of their removal the child was well.

(iv.) M. A. H., No. 396. A healthy-looking child. Vaccination without complication of any kind. There are four normal scars and the child is well.

Up to the eighth day, the 6th August 1891, there seems to have been no suspicion that vaccination was pursuing other than a normal course. The child was selected by Dr. McL. as a vaccinifer, because the vesicles appeared typically healthy. Mrs. H., the mother, informs me that during the night of the eighth the vesicles stuck to the night-dress, and during the next day (the ninth) there was a considerable amount of inflammation around them. She dressed the arm with castor oil on rags, and as the inflammation still increased she poulticed it, but did not obtain any medical advice for some days. The axillary glands commenced to swell but did not break down, and neither at this time nor subsequently was there any general eruption on the body. Thirteen or fourteen days after vaccination the mother took the child to Mr. R. C. A., who states that when he first saw the child "all the places had broken up "by inflammation into one slough, much of which had "become detached, the sores were deeply inflamed and "the diameter of the wound was from side to side of the "arm, say, two inches or more. The cavity was very deep. "I treated her and the wound eventually healed. But the "child never again was healthy. I believe she suffered "from chronic septicæmia, and died as stated above." Mrs. H., the mother, informs me that the arm was 12 weeks in healing, and that subsequently the child did not seem to rally, but continued to pine. She did not suffer from diarrhœa until just before death, but she used to sweat very much, and about a fortnight before she died began to suffer from dropsy.

As far as I was able to ascertain vaccination was well and carefully performed. Mr. W. S. uses only an ordinary lancet, which he says he is very careful to cleanse. At the date of my visit (30th December 1892) his instruments were in excellent order, clean and bright.

Mrs. H., the mother, says that the vesicles were not in any way rubbed or injured until they stuck to the night-dress on the eighth day. On the ninth and subsequent days she applied castor oil and poulticed them, but subsequently she made no application to them except under medical advice. No shield was used.

Good.

Nothing of importance elicited. E. H. is the youngest of nine children, six of whom are alive. One died of whooping-cough aged three, and one died after an accident. Three of the six living children I saw. The incisor teeth of the two youngest are very much decayed and irregular, but they do not give ground for any suspicion of syphilitic taint. Mother is a stout woman; at the time of my visit she was unwell as she was just recovering from influenza. Father a healthy-looking man. He is a groom. As far as he knew he had not been in contact with infectious disease either of persons or horses.

General surroundings. I was not able to ascertain that the child had been brought into contact with any infectious disease or suppurating wound, and neither Mr. W. S. nor Dr. McL., who respectively vaccinated and took lymph from the arm of E. H., were in attendance on any case of septic or infectious disease at the time.

Sanitary condition. Unsatisfactory. House dirty and rooms small. There is no drain communication with the house at all. Outside and just in front of the row of houses is a row of privies, which at the time of my visit, when there was a hard frost, were not offensive, but which in hot weather would seem likely to cause considerable unpleasantness, if they did not actually constitute a source of danger.

Conclusion. The child E. H. suffered from severe inflammation of the arm after vaccination, and, according to the evidence which I have been able to obtain, did not subsequently recover its usual health. Whether, as Mr. R. C. A. supposes, the child suffered from chronic septicæmia and acute nephritis from which, as he states, it eventually died, is open to doubt. In the first place I was unable to obtain any evidence either from him or from Mrs. H. that the ulcer in the arm had resulted in the formation of pus in any part of the body; in fact, they both agree that the sore on the arm was healed 14 months before the child died. Mr. R. C. A., in conversation with me, stated that he relied for his diagnosis of chronic septicæmia on the child's giving evidence of hectic fever; but he had on no occasion taken the temperature to satisfy himself that the child *was* suffering from pyrexia. He further stated that the child died of acute nephritis, there being shortly before death albumen in the urine and œdema of the limbs. He also thought that the mesenteric glands must have been affected because the child wasted and suffered from diarrhœa. Mr. R. C. A., however, does not appear to have made such examinations as were necessary to substantiate his statements, which can be regarded as little more than surmises.

Whether the child's death was directly due to septic absorption from the vaccination wounds, or to some general constitutional disturbance set up by the shock of the inflammation on its arm, I have not been able on the evidence to decide, but there does not seem to be any ground for supposing either that vaccination was improperly performed or that the vaccinator or lymph were at fault. The method of treating the vesicles was such as to increasing the tendency to suppuration.

THEODORE DYKE ACLAND, M.D.

CASE 168, REPORTED TO THE COMMISSION BY THE MOTHER OF THE CHILD.*

Case of G. K. B.: report to the Commission of Dr. Theodore Dyke Acland.

Vaccination. G. K. B., of ——, born on the 10th November 1888, was vaccinated privately by Mr. E. F., L.R.C.P., on the 4th April 1889.

Death. 31st May 1889.

Certified cause. "Vaccinia: septic absorption."

Certified by. Mr. G. H. P., M.R.C.S.

Source of lymph. Calf; obtained from Dr. R. Owing to the lapse of time it is impossible to be certain which batch of lymph was used.

Co-vaccinees. No record of all the children vaccinated from the same calf. One child vaccinated from the same tube "did absolutely well."

* *See minutes of evidence of Mrs. C. K. Beresford, appended to the Commission's Sixth Report, Questions 22876-903. The Commission also examined two other witnesses as to this case, the medical man who vaccinated the child in question, and one of the medical men under whose care she subsequently came. See minutes of evidence of Mr. E. Fyson, L.R.C.P., and Mr. F. Taylor, M.D., appended to the Commission's Sixth Report, Questions 23,019-83.*

Course of vaccination and illness. For details see the evidence of Dr. Frederick Taylor and of the vaccinator appended to the Commission's Sixth Report. The arm inflamed during the second week. Secondary pocks formed round the points of vaccination. Pocks, apparently by auto-inoculation, formed on the face and nose. When seen by Dr. Taylor, seven weeks after vaccination, there was a gangrenous wound at the point of inoculation and a sloughing wound on the nose.

Conclusion. Dr. Taylor is of opinion that the condition might be described as "vaccinia gangrenosa," and that vaccination "must have had something to do with it, but still there "must have been another factor, because the other child" (vaccinated with the same tube of lymph) "did not suffer."

THEODORE DYKE ACLAND, M.D.

CASE 169, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of M. R.: report to the Commission of Dr. Arthur Pearson Luff.

In October 1892 I was requested by the Commission to investigate the circumstances attending the death of M. R., late of ——, and the alleged connexion of the death with vaccination. I beg to report that I have made a thorough inquiry into the case, but there have been several difficulties in conducting this inquiry, owing to the death having taken place on the 27th March 1892, and to the parents of the deceased having since removed from the district.

The entry in the register of the death of the child was to the effect that M. R., six months of age, died on the 27th March 1892, the cause of death being certified by Dr. W. H. O., of ——, as "vaccination; erysipelas; pyæmia."

Dr. W. H. O. subsequently stated that he did not himself vaccinate the child, and that the mother informed him that the child was vaccinated at the public vaccination station at B. The child, however, was in fact vaccinated at public station at R. by Dr. W. B. J., of ——, who wrote as follows with reference to the case: "With refer- "ence to M. R.; this child was vaccinated by me at R. "public vaccination station on March 1st, 1892. The "vaccinifer was H. C., who was then and is now quite "healthy. One other child was vaccinated at the same "time and from the same source and suffered no incon- "venience, namely, M. O. At the inspection on March "8th four well-developed vesicles appeared in both "cases.

"The child was again seen by me on March 22nd, with "the vesicles badly rubbed. The arm, which was very "dirty, was much inflamed, and the child was very "feverish and ill.

"I prescribed for her and gave directions for the proper "treatment of the arm, and the mother promised to let me "see the child again. I never did so, as they changed "residence, and I lost sight of the case, and I did not hear "of the death till July last. The erysipelas, which I "understand supervened, was manifestly the result of "injury to the vesicles.

"I may mention that I have been for over twenty years "a Public Vaccinator, and have, during that time, vacci- "nated several thousand cases. I have never seen a fatal "result. I adopt every care and precaution in performing "the operation. My knowledge of the people enables me "to reject cases with a doubtful history as vaccinifers, and "I give each person printed instructions as to the treat- "ment of the arm. The utter carelessness and neglect of "common-sense precautions on the part of mothers has "often made me wonder how I escaped bad results. "Amongst a certain class of mothers, cases of dirt, "rubbing of the arm, attempts at protection by means of "shields saturated with the discharge of other arms, and "general defiance of all the laws of septic infection, is the "rule rather than the exception. No surgeon would "expect to escape without a large per-centage of bad "results with ordinary wounds exposing the same area "of surface, under the circumstances with which I have to "contend."

Dr. W. H. O., who certified the death of the child, in answer to questions put to him, stated that the mother of the deceased informed him that up to the time of vaccination the child was a healthy one and never had any eruption on the body, that about the fifth day after vaccination she noticed a blister on the opposite arm to the vaccinated one, and that afterwards the hand and wrist became swollen and inflamed below the blister; and this swelling, according to her account, flew about the body and came and went in the face, abdomen, and legs. Dr. W. H. O. himself first saw the child on the eighth day after vaccination, when he found there was erysipelatous inflammation and œdematous swelling of the vaccinated arm, the upper part of the body, and the other arm. He attended the child until its death on the 27th March 1892. With the exception of the erysipelatous blush, he did not see any other rash. Sloughing of the vaccination places occurred, resulting in the production of four deep unhealthy sores. The signs of pyæmia, in his opinion, were œdematous swelling, followed by abscesses in different parts of the body, viz., in the arms, face, abdomen, and legs. The child was treated freely with port wine and other liquid nourishment, but ultimately died from collapse.

Though there was no case of erysipelas in the house in which the parents of the child lived, there was a case of erysipelas next door at the time that the child developed it.

Dr. W. B. J., the vaccinator, at an interview that I had with him, informed me that the deceased was vaccinated on the 1st March from H. C., of ——, another child, M. O., being vaccinated on the same day.

H. C. is at the present time (February 1893) a healthy child, and his vaccination pursued a perfectly normal course. *Vaccinifer.*

M. O. is also at the present time a healthy child, her vaccination has been a normal one, and she has not suffered from illness connected in any way with vaccination. *Co-vaccinee.*

Dr. W. B. J.'s account of the vaccination of the deceased child M. R. was to the effect that all four places took; that on the 8th March (the seventh day after vaccination) he saw the deceased and examined the arm, when he found four successful vesicles; that he next saw it on the 22nd March (21 days after vaccination), and that it was then suffering from unmistakable erysipelas all down the left arm, the axillary glands being much enlarged.

I next proceeded to interview Mrs. R., the mother of the deceased, and found that she had moved to ——. I made an inspection of the sanitary condition of the house in which the child's parents had lived at the time of the death of the child, and found that it was an ill-ventilated house provided with only one w.c. of the long hopper pattern, with a very poor water supply, the w.c. being in a dirty condition. On proceeding to ——, where the parents now live, Mrs. R., the mother of the deceased, stated that her child was a fine healthy child until a few days after vaccination; that a week after vaccination the child became bad, and that she then took it to Dr. W. B. J., the vaccinating doctor, who was just leaving his house, and saw it in the street, telling her that the child was all right. As she felt sure that the child was ill she took it round to Dr. W. H. O. At that time the places on the arm were suppurating, and the wrist and hand were swollen.

In my opinion, and so far as I can ascertain by inquiries made so long after death, the cause of death was, as certified, due to erysipelas and subsequent pyæmia. There is a discrepancy in the statements of the two doctors as to the condition of the arm of the child about a week after vaccination. Dr. W. B. J., the vaccinator, stated that on the seventh day after vaccination the arm was in a healthy state, and the result was described by him as successful; whereas Dr. W. H. O. states that the child when seen by him on the eighth day after vaccination had erysipelatous inflammation and œdematous swelling in various parts. *Conclusion.*

In my opinion, the erysipelas was not introduced at the time of the vaccination with the vaccine lymph, for the following reasons:—

(i.) The vaccinifer H. C. did not suffer from any illness either at the time of his vaccination or subsequently, and the vaccination in him pursued a perfectly normal cause.

(ii.) M. O., the other child vaccinated from H. C. at the same time as the deceased, remained quite well after vaccination, and the vaccination in her pursued a perfectly normal course.

(iii.) According to the statement of the vaccinator, Dr. W. B. J., no erysipelas had developed on the deceased on

the seventh day after vaccination; and, according to the statement of Dr. W. H. O., erysipelatous inflammation had developed on the eighth day after vaccination.

As I have before stated, there was a case of erysipelas in the house next to that occupied by the parents of the deceased during the week following the vaccination of the child, and it is possible that this was the source of infection.

ARTHUR PEARSON LUFF, M.D.

CASE 170, REPORTED TO THE COMMISSION BY MR. J. H. LYNN.

Case of T. R. Copy of two letters received by the Commission from the medical man by whom T. R. had, it was stated, been vaccinated.

DEAR SIR, 10th June 1892.

YOUR note to hand *re* T. R. Enclosed you will find a detailed account which differs markedly from the information you have already received. The history of the case consists of notes taken by myself during my attendance on the child, and from the mother herself.

I am, etc.,

Bret Ince, Esq. C. F. W.

P.S.—I have still some of the calf lymph left, and shall be pleased to let you have it for microscopical examination if desired.

(*Enclosure.*)

Re T. R's. Case.

On May 27th, 1892, the father and mother of the above (T. R.) brought their child to be vaccinated to my surgery at ——. They ought to have taken the child to a station for vaccination about one and a half to two miles from their house during the month of April on the second third or fourth Monday, but the mother told me they were prevented from so doing because the child had had such bad colds, and so she could not take the child out.

I vaccinated the child with F.'s calf lymph in four places. The child had a *red dress* on, and I cautioned the mother about it, and told her to keep the arm out of the sleeve when she got home or use a white dress, as the dye might get in.

On May 29th, at 6 a.m., I received a message to go and see Mrs. R.'s infant, and I reached there (a distance of about three and three quarter miles) at 6.40 a.m.

The mother gave me the following history of the child's illness. On May 28th, at 2 p.m., the child was suddenly sick, and had diarrhœa, so she gave the child a Steedman's or Stedman's powder. The child was quite well before this. The diarrhœa and sickness continued till I saw the child the next day, several times during each hour. No mention was made of vaccination whatever, nor did she ascribe the child's illness to it.

When I saw the child the following was the condition :—

(i.) The child was lying on its mother's lap;

(ii.) And was feverish;

(iii.) Fauces and tonsils inflamed;

(iv.) Tongue furred;

(v.) Stomach tender and distended with flatulence;

(vi.) The vomit consisted of about pint a of undigested food, most probably Robb's or Brighton biscuits (this was shown to me in a chamber by the mother);

(vii.) The stools were watery, offensive, and some blood in them and were passed very frequently in the hour (the stools were shown to me on the diapers or napkins);

(viii.) The child was weak and prostrate from the diarrhœa and sickness.

(1.) Cold; (2) improper food, biscuits.

The child has had colds several times and so could not be taken out before. Fed on Robb's Brighton biscuits (a large bag of the biscuit swas shown me by the mother on my asking her what the child had been fed on).

I told them to come for medicine directly, and I would make it up when I got home. The medicine was not fetched until 9 o'clock.

I ordered milk and *no* biscuits, keep child in warm, &c. ***Treatment.***

I visited the child again in the afternoon about 3.30, and child had only been sick once and bowels acted once, but child still prostrate. The child died at 10.30 p.m. same night. They came for a certificate the next day in the morning, and *no* mention made about vaccination.

(*a.*) Infants are very susceptible to enteritis. ***Remarks.***

(*b.*) Enteritis more common in the summer.

(*c.*) And especially when cold in morning and evening and hot in the day, and also when moisture in the air. (At the time of the child's illness it was hot in the day and cold in the evening and morning, with mist rising off the ground in the evening.)

(*d.*) Chief exciting causes, *cold* and *improper food*, both present in this case.

(*e.*) Prognosis in these cases: very fatal in children; enteritis is the most important cause of infantile mortality; duration of illness very short in bad cases.

(*f.*) I have three people at the present time suffering from enteritis, and each with sudden onset and due to cold, and same symptoms.

(*g.*) The child was vaccinated with calf lymph obtained from Mr. W. F.

DEAR SIR, June 29th 1892.

I AM in receipt of your letter *re* T. R.

No mention was made of the vaccinated arm, nor was my attention called to it.

I am, &c.,

Bret Ince, Esq. C. F. W.

CASE 171, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of L. D. An inquiry was made into this case by a Medical Inspector of the Local Government Board The following is an abstract of his report:

One of the Medical Officers of Health in this Union reported to the Board on June 3rd, 1892, that "on or "about the 8th of May" a child named D., who had been vaccinated on the 19th April, had died, aged two months, from "erysipelas; debility." Dr. Bruce Low was directed to investigate this case, and reports to the following effect :—

L. D., the daughter of a coal-loader, was vaccinated when one month old by the Public Vaccinator, Mr. B., at his surgery (the public station) on the 19th April 1892. She died on the 18th May [Dr. Bruce Low remarks that the Medical Officer of Health seems to be under some misapprehension as to the date of death], and Mr. B. certified the death to have resulted from "erysipelas, 14 "days; debility."

Mr. B.'s register shows that the child L. D. (No. 418) was vaccinated along with two others (Nos. 417 and 419) direct from the arm of an infant named E. S. (No. 415). In each case four insertions were made, and all of these were successful.

Mr. B. vaccinates with a lancet, which, when seen by Dr. Bruce Low on the 28th June, was bright and clean. It is, Mr. B. says, kept in a case and is used for no other purpose, and is dipped in water and wiped on a clean napkin between each operation. Before commencing his weekly vaccinations he disinfects his hands in a carbolic solution. He had, he says, no zymotic disease or septic cases in his practice about April last.

Dr. Bruce Low visited the infant E. S., the vaccinifer, and found it a clean, healthy-looking child; one of a family of seven children, all healthy. Mrs. S. said the baby's vaccination passed through a normal course. At no time was the arm inflamed, and the child never gave her any trouble.

Dr. Bruce Low also visited the two co-vaccinees, viz., R. M. and F. S—d. Both children had done well. The respective mothers state the arms were never inflamed, and the vaccination places of both healed within the usual period. When seen by Dr. Bruce Low these children had each four good scars. The infant F. S—d. was used as a vaccinifer for three other children, none of whom it was found on inquiry had had any bad symptoms after their vaccination.

Mrs. D., the mother of the deceased infant, stated that the baby's arm on the eighth day (April 26th) when taken for inspection was free from any undue areola. The arm continued, she said, to go on well till about the 6th May, when she observed that one of the scabs had "come off," and that the place had been bleeding. The infant had long sleeves to its white linen dress, and there was blood on the sleeve. About this time she noticed that redness began to appear and spread from the injured place. She applied nothing to the arm. On the 8th May she took the child to Mr. B.'s surgery, who attended the child afterwards at its home till it died.

Mr. B. says he found on the 8th May that there was some diffused inflammation about the shoulder above the vaccinated arm. One scab had been knocked off, and he found linen fibres adhering to the dried blood on the arm. From this he formed the conclusion that the sleeve had been sticking to the arm. There was a place on the back of the child's hand (of vaccinated arm) suspiciously resembling a burn, but the mother denied that the place was a burn at all, and could not account for the mark. Mr. B. attended the child, and it seemed for a few days to do well; but patches of inflammation appeared on the body and chest, and the child died on the 18th May, the thirtieth day of the vaccination.

The child was fed from the breast. There had been no recent sickness in the house nor among the neighbours. The cottage was fairly clean when seen by Dr. Bruce Low, but Mr. B. says that at times he has found it dirty. The family consists now of four persons—the father, mother, and one surviving child, aged two, and the grandmother, aged 73, stone deaf, and dirty in her person and habits. She nursed the deceased occasionally.

Mrs. D. suffers frequently from epileptic fits. Her mind and memory, after fits, are not clear, and her statements cannot always be relied on. She had a bad confinement, and nearly lost her life in labour when deceased was born. Mr. B. attends the family. He says that though Mrs. D. was ill after confinement there was no suspicion of puerperal septicæmia. Mrs. D. denied having hurt her child's arm, or that the sleeve had stuck to the place after the scab "came off." She admitted, however, that she had had a fit, when nursing her other child, and let it fall.

Mr. B. is convinced from what he saw that the arm had had rough usage (probably during a fit), and that afterwards the sleeve had, more than once, stuck to the injured place, and that this had given opportunity for access of spreading and unhealthy inflammation, which ultimately caused the child's death.

Mr. B. informed Dr. Bruce Low that the mother failed to carry out his instructions as to treatment, and that the child during its illness was neglected. On frequent occasions he found the child alone and unattended to in the house; the mother, he says, spends a good deal of her time in other people's houses.

Case 172, reported to the Commission by the Coroner.

Case of L. A. L.: report to the Commission of Dr. Theodore Dyke Acland.

Vaccination. L. A. L., of ——, was vaccinated by Mr. C. A., M.D. Lond., F.R.C.S., Public Vaccinator, on the 17th May 1892.

Death. 4th June 1892.

Inquest. 9th and 15th June 1892.

"That the child died from blood-poisoning following "vaccination, but how the poisoning occurred there is no "evidence to show. The vaccination appears to have "been carried out with every care." *Verdict of Coroner's jury.*

According to the register the child L. A. L. was vaccinated direct from the arm of M. H., of ——. According to the statement of the mother and grandmother she was vaccinated from the arm of *two* children. This is absolutely denied by Dr. C. A., and no corroborative evidence was adduced at the inquest to support the statement. *Source of lymph.*

M. H. (No. 469 in the register), a typically healthy-looking child, in whom vaccination pursued a normal course. There was no enlargement of glands, no rash on the body, and no excessive inflammation round the vesicles. On the 15th June, when I saw the child, I found four normal cicatrices without any evidence of there having been suppuration or excessive inflammation. The mother stated that the child had been quite as well since vaccination as it had been before. *Vaccinifer.*

M. H. had been vaccinated with lymph taken from the arm of a child, F., a private case, and a relative of Dr. C. A.'s, who in turn had been vaccinated the week previously with calf lymph obtained from Dr. R. The child F.'s vaccination pursued a normal course, and both the mother and Dr. C. A. assured me that there was no excess of inflammation, no enlargement of glands, and no eruption on the body. The vesicles healed well and rapidly, leaving four normal cicatrices. The child was in good health and had been so since birth. *Vaccinifer of vaccinifer.*

On the 10th May four children were vaccinated by Dr. C. A. at the public station; their numbers in the register are 466–469 inclusive. Inasmuch as they were present at the station on the 17th May, I have seen them all with a view of ascertaining whether they or their parents could have constituted a source of infection for the child L. A. L. I have not found in any case circumstances which would lead me to suppose that this was the case. *Co-vaccinees of vaccinifer.*

(i.) L. C. (No. 466), of ——. The youngest of three children born in three years, has, according to the mother, always been "a poor little thing." Her nutrition is bad, and she is feeble and anæmic. In spite of this, vaccination pursued a normal course, and was followed by no excess of inflammation, no eruption, and no enlargement of glands. One vesicle got rubbed, but did not subsequently inflame. The mother states the child to be now as well as she ever has been. There is no illness in the house, and, as far as the mother is aware, she has not been in contact with any infectious disease.

(ii.) E. K. (No. 467), of ——. A well-nourished, healthy-looking child, in whom vaccination pursued a normal course, without excessive inflammation, enlargement of glands, or eruption on the body. The vesicles healed well and quickly. The child has been well since birth. As far as I have been able to ascertain there has been no infectious disease in the house, and Mrs. K. has not been exposed to any contagion.

(iii.) E. W. (No. 468), of ——. A healthy-looking child who, the mother says, has never ailed since birth. Vaccination pursued a normal course. The mother is, and has been, quite well, and, as far as she knows, has not been in contact with any person suffering from infectious disease. The landlady, Mrs. T., took the child on the eighth day for inspection, and she assured me that she is, and has been well, and had not, to her knowledge, been exposed to any infection.

(iv.) E. R. (No. 470), of ——. A well-nourished, healthy-looking child, who has always been healthy except for some papular and vesicular eruption on body and extremities, which, according to the mother's statement, had existed since birth, and had not been affected in any way by vaccination. This eruption appears to be eczematous and not specific. Vaccination pursued a normal course, leaving four healthy cicatrices. A brother, C., died a year ago, so the mother says, of bronchitis, three months after vaccination. In his case the vaccination wounds did not heal. Living in the same house is a child, A. F., reported recently to have recovered from diphtheria, for which he was treated in the —— Fever Hospital. He is said to have been quite well for some considerable time before the child L. A. L. was vaccinated.

Four; Nos. 471–474 (inclusive) in the register. *Co-vaccinees of L. A. L.*

(i.) F. S. (No. 471), aged six years. I did not see this child as he was at school, but the mother informed me that vaccination had been delayed on several occasions

because he had been ill. He had suffered from eczema, and had had chicken-pox shortly before he was vaccinated, but the vaccination does not appear to have pursued an abnormal course. I was informed that all the scabs were detached and the wounds healthy, and that there had been no excessive inflammation, and no eruption on the body. There had been no case of infectious disease in the same house, and the mother, who was at the time ill in bed with bronchitis, assured me that, as far as she knew, she had not been in contact with any such disease.

(ii.) F. W. (No. 472), of ——. A healthy-looking child in whom vaccination pursued a normal course, leaving four healthy scars. There had been no illness in the house, and the mother, so far as she knew, had not been in contact with any infectious disease.

(iii.) A. B. (No. 473). A fairly healthy child, with three normal scars on the arm, and one scab still adherent at the time of my visit on the 16th June. This was well accounted for by the fact that the sleeve of an Indian-red frock was rubbing the arm directly across the area of the vaccination, thus irritating the vesicles and delaying their healing. With this exception vaccination had pursued a normal course; there had been no general eruption and no enlargement of axillary glands, and the child was well. The mother, as far as she knew, had not been in contact with any infectious disease, and no one was known to have been ill in the house. The house was very dirty and badly kept.

(iv.) E. S. (No. 474), of ——, had moved, and could not be found.

None. Owing to the inflamed condition of the arm on the eighth day the vesicles were not opened.

According to the statement of Mrs. L., the mother of the child L. A. L., lymph was taken from the arms of *two* children, and a considerable point was made of this at the inquest; but, from the manner in which Mrs. L. gave her evidence, and from some confusion in her account as to the way in which vaccination was performed, I am very doubtful as to the accuracy of this statement, especially as, as has been noted above, the fact is denied by Dr. C. A., and there is no indication from the register that such was the case.

Mrs. L., the mother of L. A. L., states that she noticed some redness round the points of inoculation the morning after her child was vaccinated, but Mrs. M., Mrs. L.'s mother, who was present at the vaccination, says that she noticed the redness the same evening about 9 o'clock, although she did not call the mother's attention to it. It is not certain when the vesicles began to form, but according to the evidence given at the inquest it seems clear that on the eighth day there was a considerable amount of inflammation round them. Dr. W., who inspected the child as the deputy of Dr. C. A., says that he noticed nothing particular about the look of the vesicles themselves, but that there was considerable inflammation extending nearly from shoulder to elbow. After the eighth day the inflammation spread rapidly over the shoulder and to the body and extremities; an inflammatory mass appeared on the neck, which did not suppurate. Dr. S., who was attending the case, states that he has no doubt that the inflammation was erysipelas, and he believed that the child died of some septic inflammation which had taken place through the vaccination wounds, though how this originated he was unable to say.

Dr. C. A. handed in a written report to the Coroner, which I give here in full, in which the principal facts of the case are stated:—

"L. A. L. was vaccinated by me on May 17th, 1892, "from an infant named M. H., in whom the vaccination "ran the regular course, and whose arm was quite well (as "also was the baby) when I saw it last Thursday. It is "perfectly well too now, and will be at the inquest next "Thursday. H.'s infant was vaccinated from my cousin's "child, a very healthy infant whom I vaccinated from the "calf. L.'s infant, therefore, was vaccinated with lymph "that had only passed through two children, both typically "healthy infants.

"The mother's statement that her infant was vaccinated "from *two* children is evidently a mistake. I have vaccinated some 20,000 cases, but never in my life used "lymph except from one child at a time. Probably the "mistake arose from my not having enough lymph on the "lancet to complete the operation, and going back to the "table where the charged tubes would be lying and using "one of them. To save the mother's time we often take "the lymph in tubes, which are laid across a slip of paper, "upon which in every case the name of the child from "whom the lymph came is written, and I might, therefore, "take some direct from an arm and some from a tube, but "in all cases it would be the same lymph. After using a "tube it is immediately broken and thrown away. "Directly I have vaccinated a child I fill up the vaccination paper, first writing across the corner the name of "the child I have vaccinated *from*, so that it is impossible "to make a mistake. The Local Government Board "insists most strongly on Public Vaccinators using only "lymph the exact source of which is known.

"To ensure safety I have a glass of water on the table "into which I dip the lancet every time after using it, "and then wipe it on a clean cambric handkerchief before "using it. I am so accustomed to do this that I do it "mechanically. The lancet I use is unlike any other I "have, and is never used save for vaccination, nor has it "ever been used for any other purpose since I bought it.

"As to the condition of the arm when brought for "inspection on 24th May I cannot speak, as my deputy, "Dr. W., attended that day. He will be at the inquest "to tell the jury what he knows about the case. I never "saw the case after May 17th, when I vaccinated it.

"Since I heard last week of this inquiry I have called "upon every other infant that came to the vaccination "station the day L.'s infant was vaccinated, whether to be "vaccinated or to have the arms inspected. All the cases, "nine in number, are, without exception, quite well, and "all the parents say the arms got on capitally. It is quite "evident, therefore, that wherever L.'s infant became infected with the germ of erysipelas it did not do so at the "vaccination station, and the germ most certainly was "not conveyed to it by the vaccine lymph; and from the "symptoms described by Dr. S., I am sure his view is "correct, viz., that the vaccine wound on little L. A. L.'s "arm became accidentally infected in some way, subsequent to vaccination, just as any other wound might do, "even the scratch of a pin, or the sting of an insect. I "I ought to add that I was not attending any case of "erysipelas at the time.

"C. A., M. S., M.D. Lond., F.R.C.S.,
"Public Vaccinator for ——,
"June 14th, 1892."

From the evidence of Mrs. L., the mother, at the inquest it appeared that she considered the child was ill from the day after vaccination, but she assured me that she did not think that the child was ill during the first week, and that it was not irritable until after the eighth day, although the arm was much inflamed on Sunday, the 22nd May. It would appear that she cannot have thought that there was anything really the matter with the child, for from an inquiry which I made subsequent to the inquest I elicited the fact that on the Saturday she and her husband took it at five in the evening to Epping Forest, and remained out with it until between nine and ten. That the mother did not consider the child to be seriously ailing may further be gathered from the fact that she did not take it to the doctor until the evening of the day of inspection, eight days after vaccination.

Treatment of vesicles. In her evidence Mrs. L. stated that she did not go anywhere on her way home from the station on the day of vaccination, that she made no application of any kind to the vesicles, that she did not rub them, and was very particular to prevent the sleeve from causing irritation.

Method of vaccination. In answer to questions from myself, Dr. C. A. stated that under no circumstances whatever does he use a capillary tube on more than one occasion, that he has discarded the use of points for many years, that his lancet is kept by itself and used for the purpose of vaccination only, and that as he commenced his vaccinations at 9.30 in the morning he had seen no cases on that day, and that, therefore, so far as he knew, there was no probability of his having conveyed infection by his person or clothes to the child when he vaccinated it.

Previous history. As far as is known the child was healthy up to the time of vaccination. It was an only child; the parents are both young and appear to be reasonably healthy, although the father is of poor physique and anæmic.

Family history. Nothing of importance ascertained.

General surroundings. Poor and dirty. The parents sleep in the same room in which they live, and occupy the house in common with Mrs. M., Mrs. L.'s mother, who has six children. None of the inmates of the house, as far as I was able to ascertain, had recently suffered from any infectious disease.

Sanitary condition.

No drain communicated directly with the house so far as I could ascertain. The scullery sink discharged over an open gulley through a hole in the wall. The stench from the closet was almost unbearable, and on my remarking that Mr. and Mrs. L. had stated that they did not know the drains were out of order, Mrs. M., Mrs. L.'s mother, admitted that she had complained to the landlord, and that they were being put in order that morning. The man who was engaged at work upon the drains informed me that the drain from L.'s premises had been completely choked, and that he had been engaged in removing the obstruction. He agreed with me that the stench from it was nearly as bad as anything could be. The closet also next door, which backed upon the L.'s premises, was said to be stopped, and the man further informed me that this house next door to the L.'s had been tenanted by a person who was practially destitute, and that the whole place was greatly in need of repair. The gulley in this house, over which the scullery pipe discharged, was stopped up, and the whole of the surrounding ground was saturated with filth, and overgrown with green slimy moss, such as appears on places which are constantly kept moist. The back premises of the L.'s house were extremely untidy, and littered with all kinds of refuse, so that any of the children playing in the yard, and coming in to nurse the baby would have ample opportunity of infecting an open wound with some septic virus. Both Dr. S. and Dr. C. A. are aware that the neighbourhood of ——— Road, where L. A. L. lived, is very unhealthy. Dr. S. had recently had two cases of sloughing wound from accident in the immediate neighbourhood of the L.'s house, one in No. 18 and another in No. 8. Both were injuries to the leg, in one the girl slipped and grazed her shin, and in the other the man slipped in the street. In both cases the wounds took on an unhealthy action but are now well.

The verdict in this case seems to be in accordance with the facts. The child died of some diffuse inflammatory affection spreading from the vaccination wounds. The satisfactory behaviour of the lymph in the other cases vaccinated with it tends to the conclusion that neither the lymph nor the vaccinator were at fault; whilst the filthy state of the house and the extremely insanitary condition of the premises, together with the fact that the child was kept out late at night when it was said already to be ill, make it impossible to doubt but that it was exposed to grave danger, both from its surroundings and its treatment.

THEODORE DYKE ACLAND, M.D.

CASE 173, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of W. N.: report to the Commission of Dr. Thomas Barlow.

I examined this case in June 1892 at the Westminster Hospital, and I have nothing to add to the very complete report of it by Dr. Colcott Fox, under whose care the child was, in the Transactions of the Clinical Society, Volume 26, at page 108. A copy of Dr. Fox's report of the case is appended to this.

The case was undoubtedly one of generalised vaccinia as distinguished from impetigo following vaccination, and though much less severe it was of the same character as one (Case 214 *) the subject of a report by Dr. Theodore Acland to the Commission, and likewise recorded in the same volume of the Clinical Society's Transactions at page 114.

THOMAS BARLOW, M.D.

(From the Transactions of the Clinical Society, Volume 26, pages 108–9.)

Two cases of Generalised Vaccinia. By T. Colcott Fox, M.B. Read February 10, 1893.

CASE I.—William N. was born in a lying-in-hospital on May 21, 1892, and on the 25th of that month was vaccinated, with a number of other infants, from a baby selected at the National Vaccine Establishment in Lamb's Conduit Street. In William N. only did anything unusual occur. The mother was discharged from the hospital at her own request on June 2, and on that day her infant was examined in the usual course by the authorities at the hospital, and the vaccination had apparently run a normal course. The mother, however, states that at this time a very small vesicle was present on the scalp. From this date, the ninth day after vaccination onwards, lesions appeared day by day. On the 8th June, *i.e.*, on the 15th day, the baby came under my observation at the Westminster Hospital, and then the vaccinated arm was swollen, reddened, covered with a dense aggregation of varioliform vesicles rather smaller than perfect vaccine vesicles, surrounding the primary lesions. Other typical vaccine vesicles, perhaps thirty or forty, were disseminated sparsely, and far apart over the trunk (back and front), the limbs, and especially the scalp. The child did not appear to be very ill, only peevish and fretful; the skin temperature was 99·4° F. On June 12, the nineteenth day, the vaccinated arm was completely covered with a crust, and a few additional lesions had developed on the trunk and limbs. The mother pointed to a small *pustule* recently evolved, and remarked that the later lesions did not attain the size of the earlier ones. On June 15, *i.e.*, on the twenty-second day, the eruption was subsiding rapidly, but Dr. Gossage, the house physician (to whom I am indebted for careful observation of the case), noticed the evolution of a few abortive *pustules* for a few days longer. These later small lesions attained the pustular stage very rapidly, and were not characteristic of vaccinia. The earlier typical vaccine vesicles tended to leave scars, though very slight ones.

On the brother's scalp was an irregularly-rounded large pus bulla, characteristic of those seen in Pediculosis capitis, and unlike a vaccine vesicle.

* *See page* 102.

CASE 174, REPORTED TO THE COMMISSION BY THE CORONER.

Case of A. V. C.: report to the Commission of Dr. Arthur Pearson Luff.

On the 16th June 1892, at the request of the Commission, I proceeded to ——, and, on the 17th, attended the Coroner's inquest touching the death of A. V. C., aged eight months, late of ——, daughter of A. C., a sign-writer. A communication had previously been received by the Commission from the Coroner's officer, to the effect that a statement had been made that the infant had died from illness caused by vaccination, and that the deceased was vaccinated by Dr. W., of ——.

The evidence of the mother of the child was that she took the child to Dr. W. on the 28th May 1892 to be vaccinated, the child at the time being somewhat troubled with teething. The child was little, and was rather delicate, but had never had any particular illness. Dr. W. vaccinated her, using a tube which he said contained calf lymph received from London that day. About the third day after vaccination the infant began to be restless and to whine, and did not take her food properly. The vaccinated places (four in number) filled well, but she seemed very poorly. The mother took her to the doctor again seven days after the vaccination, not seeing anything necessary to take her for before, and thinking there was no special illness, beyond the ordinary run of vaccination, and Dr. W. made no special remark on seeing the child. Deceased seemed afterwards very poorly and occasionally took her food badly, but at other times took it greedily. The arm continued to be very inflamed, but the mother never saw any swelling or redness except at the vaccinated part. All Monday, the 13th June, the infant seemed to be worse, but the mother did not call in medical assistance. The same night the mother and father went to bed at 11 p.m., the deceased sleeping in the same bed. At 4 a.m. on Tuesday morning the mother last saw the child alive, when it was lying on its side on the mother's arm, on the left side of the mother, the face of the child being opposite the mother's neck or breast; the child was then awake and seemed to be breathing rather heavily, but much the same as during the day. The mother did not cover the child's face and did not give it nourishment. The mother went to sleep, and between 6 and 7 a.m. awoke, when she discovered the child was dead, lying on her left side, the face not being covered.

In answer to questions that I put, the mother stated that the child did not suffer from convulsions, vomiting, or diarrhœa after vaccination, nor did any rash appear upon the body, or upon the extremities, apart from the vaccination marks.

The post-mortem examination was made by Dr. Ashby, Physician to the Manchester Hospital for Children, and lecturer on diseases of children in Owen's College. Dr. Ashby stated that the body was poorly nourished, but not

emaciated. There were four scabs on the left arm corresponding to vaccination marks, the scabs were easily removable and left superficial healing ulcers. Internally, the lungs were gorged with dark fluid blood, the veins of the skull were gorged, and some small hæmorrhages had taken place on the surface of the brain. The stomach was much dilated, and in a condition of catarrh. The bones of the skull were more or less rickety. There were no other important appearances. The immediate cause of death was asphyxia, which may have been produced by having been wrapped in a shawl, or by convulsions. Death was probably fairly rapid.

In answer to questions put by the Coroner, Dr. Ashby said that there were no signs of inflammation about the arm, and that he did not in any way connect death with vaccination.

In answer to a question I put, Dr. Ashby said that there were no appearances in any way indicative of septicæmia.

Dr. W. stated he was Public Vaccinator for ——, and vaccinated A. V. C. on the 25th May from calf lymph which he had received the same day from Dr. R., of London. He produced his book containing a note of the child being brought the following week, and of the vaccination being marked, "successful in four "vesicles." After that he heard nothing until he heard of the child's death. He vaccinated three other children from the same lymph at the same time, and he had seen them all on the preceding day (16th June), and they were all doing well. He vaccinated also on the same day fo ur private patients with the same lymph and they were all doing well.

The father of the child confirmed the mother's evidence, and stated that after vaccination the child seemed to be ailing, but not more than, in his opinion, most children do at the vaccination period. On Monday, the 13th June (the day preceding death), he considered that the vaccination was taking its ordinary course, and he did not think that the child was bad, or likely to die, or in need of a doctor's attendance.

The verdict of the Coroner's jury was that the deceased child was found dead in bed from asphyxia from natural causes.

on. The cause of death was asphyxia, most probably from overlaying on the part of the mother, or from the bedclothes suffocating the infant. I am confident that the death of the child was not in any way directly connected with vaccination. The statement that had been made to the effect that the infant had died from illness caused by vaccination was apparently a rash and careless statement made by the mother, owing to some irritation caused by the refusal of Dr. W. to give a certificate of death, and to his insisting that an inquest was necessary. This statement of the mother's was not repeated in the witness-box.

ARTHUR PEARSON LUFF, M.D.

CASE 175, REPORTED TO THE COMMISSION BY MR. J. H. LYNN.

Case of H. E.: report to the Commission of Dr. Theodore Dyke Acland.

H. E., aged two years, of ——, was vaccinated by Mr. E. T. R., M.D., on the 17th May 1892. Vaccination had been purposely deferred by the parents, and not because the child was in ill-health.

Ulceration of arm at point of vaccination.

f Direct from the arm of E. F. W., aged five months.

er. E. F. W. was vaccinated when she was six weeks old, and the arm healed without complication and was well in fourteen days. The child's health has been good since birth. She is now well-nourished, with a clear skin, and no evidence of syphilis.

er E. F. W. was vaccinated from H. W., of —— ; whose vaccination also was without complication. The wounds healed well and quickly, and have remained so. The child is rather anæmic, but well nourished. About a month after vaccination there was an eruption of papules, chiefly about the back and neck, which lasted for a month, leaving no discolouration. The child's skin is now clear, without eruption of any kind, and there is no evidence of syphilis.

None *Co-vaccinees.*

None. *Sub-vaccinees.*

Vaccination appeared to pursue a normal course until towards the close of the second week. Mrs. E., the mother, assures me that she made no application to the arm except under medical advice; that she did not cover the vaccination wounds; that she did not attempt to wipe away the lymph at the time of vaccination, and did not use a shield. She says that, by the twelfth day, the arm was very much inflamed, the redness extending from elbow to shoulder. The arm was not inspected on the eighth day by Dr. E T. R. as he was away; but it was seen, Mrs. E. says, by Dr. R——e, Dr. E. T. R.'s substitute, at the dispensary. This must have been an error, for I have seen Dr. R——e, and he informs me that he did not see the case; but that it was seen by a *locum tenens* who was acting for him. It is said that on the eighth day the areola was more marked than usual, and about the eleventh day, when Dr. E. T. R. saw the arm, ulceration had already begun. He informs me that the ulcers had hardened edges and a dirty, sloughy base. He treated the child with iodoform, etc. On the 8th June, the twenty-fourth day after vaccination, the child came under the care of Dr. W., who for many years has acted as Public Vaccinator. He informs me that when he first saw the case he considered it as one of simple vaccinal ulceration, and treated it as such with boracic ointment, giving the child internally compound syrup of phosphates. Under this treatment the wounds rapidly healed. When first seen there was considerable excavation with purulent discharge, the ulcers not being covered with a scab. There was no enlargement of axillary glands, and no abscess in the neighbourhood of the wounds. There was one ulcer only, vaccination having been performed in only one place. There was no rash upon the body. *Course of vaccination and illness.*

On the 8th September 1892, when I saw the child, it was stout, rosy, and healthy looking, with a clear complexion, no eruption on the body, and with no evidence, that I could detect, of congenital disease. The skull was well formed, the teeth excellent, the cornea clear and bright. Just below the insertion of the deltoid there is a linear scar, on the outer end of which there is a little puckering with some induration, but otherwise the scar is soft and smooth, with no sign of thickening around its base. There are no enlargements of glands in the axilla or neck. At the tip of the elbow there is another scar which looks as if it might have resulted from a wound, and it is said to have been caused by the child having fallen upon the kerb on the morning of its vaccination. The wound of which this scar is the result is that which is alluded to by Dr. E. T. R. and Dr. W. as "the sores on the arm." It has nothing to do with vaccination or with the child's previous history, and is merely the result of a rather deep abrasion. *Present condition.*

A simple lancet was used, which, Dr. E. T. R. assures me, was cleaned after each vaccination, and often soaked in carbolic lotion. *Method of vaccination.*

As far as I could ascertain, good. The child was brought up by hand after the first fortnight, and was therefore not being suckled during vaccination. *Previous history.*

The father and mother are said to enjoy good health, and there has been no illness in the house. Mrs. E., the mother, has had nine children, of whom I saw four. The eldest is a girl of sixteen, and the youngest a child of a few months old. In none of them was I able to detect any sign of congenital syphilis. Dr. W. has made further inquiries, and he writes to me that he has been unable to elicit any information that would lead him to suppose that either the father or mother has suffered from syphilis, or that any of the children who are alive are otherwise than healthy. *Family history.*

Three children have died; the second at sixteen months during dentition. The certificate is signed by Dr. M., dated the 23rd June 1878, as "whooping-cough, 21 days; "convulsions, 3 days." The third child was prematurely born, owing, as the mother says, to her having fallen downstairs when she was pregnant; it lived only one day, and was not registered, being reckoned as a still-born child. The seventh child was born at the eighth month, and survived four weeks. The certificate is signed by Dr. C., dated the 13th February 1889, as "marasmus; asthenia: "premature child." The living children, with the exception of the baby, have been all successfully vaccinated by Dr. W. without any complication or unusual result.

Fairly satisfactory. The house was not very clean, but was of the ordinary type of a labourer's cottage. *General surroundings.*

Sanitary condition. There was no connexion between the house and any drain, and I was not able to detect any sanitary defect which does not often exist in the houses of the poor; or anything likely to create an unusual source of danger for persons suffering from an open wound.

Conclusion. From the early appearance of ulceration and from the deep excavation, suppuration, absence of scab and absence of induration of glands, I am of opinion that there is no evidence that this case was one of inoculated syphilis; all the evidence tends to show that it was one of simple vaccinal ulceration, and, so far as I have been able to ascertain, the supposition put forward by Dr. E. T. R., that the family history "being undoubtedly bad, several children "dying at an early age, implies the presence of syphilis," is without foundation.

THEODORE DYKE ACLAND, M.D.

CASE 176, REPORTED TO THE COMMISSION BY THE PERSON CONCERNED.*

Case of Frederick John Harsant.

Mr. Harsant, after giving evidence before the Commission on the 29th June 1892, *was examined by Sir William Savory, Dr. John Syer Bristowe, and Dr. William Job Collins, members of the Commission.*

Copy of a letter subsequently received by the Commission from the War Office.

War Office,
10th April 1894.

SIR,

I HAVE the honour to acknowledge the receipt of your letter, with enclosure, of the 21st ult., and, in reply, to inform you that endeavour has been made to obtain information with regard to Mr. Harsant's evidence but that considerable difficulty has been experienced owing to the length of time that has elapsed since that gentleman's enlistment.

The Annual Return of Sick, Shorncliffe, for 1868 has been examined, and the remarks with reference to vaccination at that Station are as follows:—"Vaccination has "been successfully carried out in the various Corps "occupying the Camp during the year."

No admissions to hospital appear to have occurred from Cow-Pox, or for any disease of a nature similar to that described in the evidence.

I attach a copy of Mr. Harsant's Medical History Sheet in which it is seen that his statement is quite uncorroborated and that *failure* was the result of re-vaccination in his case.

I have, etc.,
W. A. MACKINNON, D.G.

* *See minutes of evidence of the Rev. F. J. Harsant, appended to the Commission's Sixth Report, Questions* 23,213-327.

(*Enclosure.*)

MEDICAL HISTORY.

—	Battalion or Brigade.	Regiment or Corps.	Regimental Number.
On enlistment		*105th*	*1469*
Transferred to: On 18			
Transferred to: On 18			
Transferred to: On 18			

Surname: *Harsant.* Christian name: *Frederick.*

Enlisted on *6th January 1868.* at

Birthplace: Parish: *Framlingham.* County: *Suffolk.* Country: *England.*

Age (last birthday): *18 years.*

Former Trade or occupation: *Painter.*

General Remarks on his Habits and Conduct in the Service, Temperance, &c.

Good. Temperate.

(Signed) *W. G. Bradish, Captain.,*
Commanding Depôt, 105th L. I.

The results of each subsequent examination to be recorded in all cases of transfer to other regiments.

Height	*6 feet 6 inches.*
Circumference of chest (over the nipple)	*34¼ inches.*
Spirometer	
Weight	
Dynamometer	
Small-pox marks	*None.*
Vaccination marks	*Right arm.*
When vaccinated	*Childhood.*
Hair	*Brown.*
Pulse (regular)	*74 beats.*
Respiration	*20 inspirations.*
Muscular development	*Moderate.*

Rank and Dates of Promotion; also Dates of Transfer to other Regiments.	Dates of Punishment; and whether Corporal or by Imprisonment.
Nil.	*Nil.*

The above was his state when examined on the *13th day of January 1868.*

(Signature): (*Signed*) *E. Watson.*

(Rank): *Staff Surgeon 10th D. Bn.*

Re-vaccinated on *27th day of February 1868.*

Result: *Failed.*

(Signature): (*Signed*) *E. Watson.*

(Rank): *Staff Surgeon 10th D. Bn.*

Discharged by purchase 6th June 1868.

(*Signed*) *W. Hensman,*
Staff Asst. Surgeon, 10th Depôt Battn.

Station, Garrison, Barrack, General Hospital, &c.	Date of Arrival at the Station.	No. in Admission and Discharge Book.	Date of Admission to Hospital. Year.	Month.	Day.	Date of Discharge from Hospital. Year.	Month.	Day.	Diseases: (a) Primary, (b) Secondary.	Duration of Diseases. Days.	Treatment. Class of Remedies.	Observations. Circumstances in or by which Disease was induced.
Shorncliffe, 13th Jan. 1868.	*13th Jan. 1868.*											

Case 177, reported to the Commission by Mrs. A. Geall.*

Case of N. R. F.: report to the Commission of Dr. Theodore Dyke Acland.

N. R. F., aged six months, of ——, vaccinated privately by Mr. G. H. in March 1877.

3th April 1877.

"Vaccination; sloughing wound; exhaustion."

Mr. H. M. L., M.R.C.S.

No record.

No record.

No record. Vesicles believed not to have been opened.

[*Note.*—Owing to the lengthened period which has elapsed since the events occurred and to the fact that Mrs. F., the mother of N. R. F., is in too feeble a state of health to answer inquiries in person and has on two separate occasions begged to be excused, the record of the case is unavoidably incomplete. The following account of the case is taken from the statement of Mr. H. M. L., who attended the child through her illness.]

"The vesicles after the first week formed into large "crusts, with a deep red blush around. These crusts "came off leaving deep suppurating ulcers which gradu- "ally coalesced. I cannot say whether the glands were "affected. . . . . There was a great want of "power, and the child died from exhaustion."

No record.

First with bread poultices; afterwards with ointment.

According to Mr. H. M. L. the child N. R. F. had a cough some little time after vaccination, accompanied by frequent epistaxes and there was a suspicion of whooping-cough. According to an account of the case forwarded to the Commission by Mr. J. H. Lynn on the 29th June 1892, "soon after the operation" (of vaccination) "was "performed the child had a cough come on, which got "gradually worse, until it caused blood to flow from the "nose."

The family of F.'s were frequently under the care of Mr. H. M. L., who considers that "they were not a "healthy family."

According to Mr. H. M. L. "there was a great want of "cleanliness."

The evidence in the case is incomplete, but it tends to show that the child N. R. F. suffered from severe ulceration of the arm at the seat of vaccination and that at any rate this was one factor in causing death. Whether and how far the child's health had suffered previous to vaccination, or what if any extraneous causes may have determined the vaccinal ulceration, I have not been able to ascertain.

Theodore Dyke Acland, M.D.

Case 178, reported to the Commission by the Mother of the Child.†

Case of M. C. P. An inquiry was made into this Case by a Medical Inspector of the Local Government Board; and an analysis of his report is given on page 12, *where the case is numbered as Case XXVII.*

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* *See minutes of evidence of Mrs. A. Geall, appended to the Commission's Sixth Report, Question* 23,352.

† *See minutes of evidence of Mrs. M. A. Pearce, appended to the Commission's Sixth Report, Questions* 23,353–82.

Case 179, reported to the Commission by the Mother of the Child.*

Case of Annie Elizabeth Perkins.

Copy of a letter received by the Commission from the Crown for the City of Leeds, by whom an Inquest had, it was stated, been held on the body of Annie Elizabeth Perkins.

Coroner's Office,
6, South Parade, Leeds,
22nd March, 1894.

Sir,

I am in receipt of your letter of the 21st, asking for copy evidence taken on the death of a child named Annie Elizabeth Perkins, in February 1877.

I am unable to comply with the request, the papers for that year having been destroyed. In 1890, the old papers were destroyed except from January 1880, it being considered, on consultation with the City Authorities, that ten years' accumulation would be quite sufficient.

From the extract of evidence sent with your letter, I see that Mr. Corrie was the medical man in charge of the case. Mr. Scattergood was called by me at the inquest as an expert, an independent witness. Mr. Corrie is now dead, but Mr. Scattergood is still in practice and is at present Dean of the Yorkshire College. I have sent to inquire and find that he has bound up in his note-book a full note of his examination of the body, and cuttings from the local newspapers of the evidence given at the inquest.

I am, &c.,

Bret Ince, Esq. Jno. C. Malcolm.

Copy of a letter received by the Commission from Mr. Thomas Scattergood.

41, Park Square, Leeds
May 10th, 1894.

Dear Sir,

In reply to your inquiry concerning the case of the child Perkins, I herewith forward:—

(1.) A copy of my notes of the post-mortem examination;

(2.) Newspaper reports of the inquest.

I shall feel obliged if you will return the latter when convenient.

Yours, &c.,

B. Ince, Esq. T. Scattergood.

(*Enclosures.*)

(1.) *Extract from note-book.*

Feb. 10th, 1877, at 3.30 p.m. in the presence of Mr. Corrie, made a post mortem at 11, Haigh's Buildings, York Road, on the body of Annie E. Perkins, æt. three months, who died Feb. 9th at 5.30 a.m., 34 hours previously.

Skin, generally of a yellow colour, with a few patches of bright red on arms and legs, and post mortem livid discolourations on the other parts: everywhere swollen, tense, and pitting on pressure.

Left arm showed three vaccination marks, dry, and without scabs. Close to point of left elbow was a wound rather less than one of the vaccination marks, and where I am told there had been a burn.

On right arm below elbow was a vesicated patch about an inch square with a sloughy appearance. Vessications on the nates where there had been pressure, on the arm, and on the ear. No enlargement of axillary or cervical glands: no appearance of inflammation of lymphatics.

There was a good layer of fat beneath the skin of thorax and abdomen.

The internal organs were all healthy. The lungs, liver and brain, contained rather less blood than usual; there was some fluid in the ventricles of the brain. Beneath

* *See minutes of evidence of Mrs. M. Perkins, appended to the Commission's Sixth Report, Questions* 23,449–74.

the scalp on right side was some vascularity and inflammatory effusion. There was no pyæmic abscess anywhere in the body.

(2.) *Newspaper reports of the Inquest.*

Alleged case of improper vaccination in Leeds.

Yesterday, Mr. Malcolm, Leeds Borough Coroner, held an inquest at the Town Hall on the body of a child, three months old, named Ann Elizabeth Perkins, whose parents live at 11, Haigh Street, York Road. It had been alleged that the child died from the effect of improper vaccination, hence this inquiry. A large number of prominent anti-vaccinators were present in the court. Mr. Baker, barrister, said he was instructed by Mr. Pickering to appear on behalf of the parents of the child.

Mrs. Perkins, the mother of the deceased, said that the child was vaccinated by Mr. Joseph Corrie, on the 23rd January. On the eighth day after the operation was performed, Mr. Corrie took off the lymph. On the following day the child became ill, and her shoulder was swollen and inflamed. The child was seen every day by Mr. Corrie until Thursday last, and she died on Friday morning. After she was vaccinated the child got a slight burn on the left arm below the elbow. The arm was red where it had been burnt. The spot was covered when the doctor called, but she told him what it was.

The Coroner (addressing Mr. Baker) said that of course he wished to render this inquiry as thorough as possible. At the same time he had been informed that he (Mr. Baker) was not attending the inquiry at the request of the parents of the deceased, but that someone had induced them to allow someone to attend. This was simply a court held to ascertain the cause of death, and not for the purpose of discussing or theorising about any particular dogma. He did not wish to raise any objection to Mr. Baker's appearance, if he could show that he appeared really at the request of the parents.

Mr. Baker.—I am simply instructed by Mr. Pickering on behalf of the parents of this child.

The coroner said that anyone to whom blame was likely to be attached had a right to be represented. It was not so necessary that anyone who had a complaint to make should be represented, so long as the Coroner made a due inquiry into the circumstances. He was not aware that there was any accusation that the officer who had charge of the case had not brought all the necessary evidence into court. He hoped, therefore, that Mr. Baker would not prolong the inquiry unnecessarily.

Mr. Baker then cross-examined the witness, who, in answer to his questions, said that before the deceased was vaccinated she was quite healthy. The child was a little fretful after the burn.

Mr. Joseph Corrie, in reply to the Coroner, said that he assisted his brother, Mr. James Corrie, in his practice. He was not a qualified medical practitioner. He vaccinated the deceased on the 23rd January. On the same day he vaccinated another child from the same lymph. He took the lymph from the child of a Mrs. Wood. When he took off the matter from the deceased he saw the burn on the left arm. The arm was somewhat inflamed round the margin of the burn. The vesicles on deceased's arm were pure and white, and there was very little inflammation. The lymph was perfectly pure and healthy. On the second night after taking off the lymph he again saw the deceased, and found that the arm was uncovered, contrary to his instructions and rather inflamed. He gave instructions as to the treatment of the child, and visited her again on the following Sunday. Her chest, the left side of the neck, and the left arm were then inflamed. He told the parents to send for some medicine. He did not see the child again.

Cross-examined by Mr. Baker.—Did you apprehend any danger from this burn that has been spoken about?—Witness: Yes. I dare say I said that it was a most unfortunate thing.

Do you think from what you saw that the burn was likely to have anything to do with the cause of death?—It may have set up erysipelas.

Mr. James Corrie, surgeon, examined by the Coroner, said that he acted as deputy for Mr. Holmes, who was the Government vaccinator for the district. He saw the deceased on the eighth day after she had been vaccinated. The vesicles were pure, pearly and white, and he observed nothing unusual. There was a cloth round the child's elbow, which he was told was on account of a slight burn. He did not examine it. When he next saw the child there was erysipelas in the left arm, neck, left side of the head, and on part of the chest, and the vesicles were elevated and swollen. He prescribed the usual remedies, but the erysipelas continued to progress until the child's death. The lymph used in the vaccination of the deceased he had had since August, and he thought that on an average he had vaccinated three children a week with it since then.

The Coroner.—Have you found any difficulty in any other case?—Witness: No.

Has your attention been called to any case?—No. He had seen the results of the use of the lymph taken from this child and they were satisfactory, except in one case, where the child had rubbed its arm. The other cases were as satisfactory as anyone could wish.

The Coroner.—To what do you attribute the erysipelas?—Witness: I cannot attribute it to any definite cause. There is one thing. The child's parents are living in a house in a street which is simply a "puddle."

The condition of the atmosphere might very materially affect the child?—I cannot say, of course, that it did. Witness added that in testifying as to the cause of death he put "burn" into the certificate, as he thought there might be an inquest, and he wished that every fact in the case should be known. The primary cause of death was erysipelas.

Cross-examined by Mr. Baker.—Had the child erysipelas before it was vaccinated?—Witness: Not that I am aware of.

It was vaccinated, and after it was vaccinated erysipelas appeared?—It was vaccinated, it was burnt, and after the lymph was taken off then erysipelas appeared.

How does vaccination become a secondary cause and erysipelas the primary cause when the child was vaccinated a week at least before erysipelas appeared?—Because in giving a certificate of death we must give the approximate cause of death, which in this case was erysipelas. The other causes we must give afterwards.

Mrs. Emma Wood and a *Mrs. Strong* were next examined, and stated that they had each had a child vaccinated by Mr. Corrie recently. The children were now in good health. (Mr. Corrie stated that Mrs. Strong's child was the one he vaccinated with the lymph used in the case of the deceased.)

Mr. Scattergood, surgeon, said that he had made a post-mortem examination of the deceased. The child was plump and stout. The skin was of a yellow colour, with spots of bright red on the arms and legs, and a dark red in other parts. After describing the other appearances of the body, he stated that there was no disease of any of the internal organs. He should suppose that death resulted from erysipelas.

The Coroner.—Can you go further, and say what had produced erysipelas?—Witness: There was nothing in the appearance of the body to enable me to state positively what was the cause of the erysipelas.

The symptoms you have given us—are they symptoms of blood poisoning?—No, sir. I ought to have added, with regard to my post-mortem, that there was no swelling or enlargement of the glands of the armpits or neck, nor any other indication of poisoning.

You put it as a simple case of erysipelas? What the erysipelas arose from you can't say?—I cannot say positively.

Cross-examined by Mr. Baker.—Do I understand you to say that the burn had anything to do——?—Witness: No, I do not say anything of that kind. My answer was that there was a burn and marks which had the appearance of being vaccination marks, but that there was nothing in my post-mortem examination to lead me to say from which of these erysipelas had arisen.

Might the erysipelas have arisen from the burn?—It is quite possible.

I thought I understood you to say that you had not formed any opinion as to the cause of the erysipelas?—I

stick exactly to the words I gave the Coroner. I said a burn such as that might cause erysipelas.

But you did not come to that conclusion before I asked the questions?—Oh, yes; certainly.

Witness, in answer to further questions, said that he had not read Dr. Jenner's works, and was not aware that he said that erysipelas, if it does not always follow vaccination, was generally the consequence of it. From his own experience, he knew that erysipelas was a result of vaccination.

The Coroner.—I take it that erysipelas may arise from many causes, vaccination being one.

Mr. Baker.—Do I understand you that you were unable to suggest to the jury any cause for the erysipelas?—Witness: I adhere most strictly to the words of my answer. I object to have any other words put into my mouth.

In your opinion is erysipelas ever caused by vaccination?—Certainly it is.

In this case vaccination was performed and erysipelas followed. Is that the fact?—I have heard the evidence. Mr. Scattergood added that he must not be understood to be fencing the questions, but was adhering strictly to the results of his post-mortem.

In answer to one of the jury, *Mr. Scattergood* said that if the arm was left exposed after the lymph was taken off, he thought erysipelas was much more likely to follow. If there had been friction on the sore, it was much more likely that erysipelas would follow than if there had been no friction.

The Coroner.—Mr. Corrie mentioned another matter, viz., that malaria might have a great influence on the sore.

Mr. Scattergood said that atmospheric causes were very likely to produce it. He was free to confess that erysipelas might follow vaccination, and that they were unable to state any other cause for it—vaccination, too, which had been performed with as pure lymph as could be obtained, and with as much care as could be given to the operation. In the case of one of his own children, of which he took special care, erysipelas undoubtedly followed vaccination, and was caused by it.

Mr. Baker then called *Dr. W. Hitchwood* of Liverpool, who said that he had given considerable attention to the subject of vaccination, and has had many years' experience as a vaccinator. He had made a post-mortem examination of the body of the deceased, and he agreed in the main with the evidence given by Mr. Scattergood. He was of opinion, however, that the erysipelas was caused by the vaccination, but he imputed no want of skill in performing the operation, or impurity in the lymph. He would never have thought of mentioning the burn on the child's arm in connection with its death, the wound being very slight.

Mr. Crossby, surgeon, Leeds, was also examined by Mr. Baker, and said he examined the body of the deceased, in company with the last witness. He agreed with Dr. Hitchwood's evidence.

This was all the evidence, and Mr. Baker was about to address some remarks to the jury, but

The Coroner said that it was not the practice in this court, or in any coroner's court in this district, for legal gentlemen to address the jury. The jury were quite competent to form an opinion as to the cause of death.

Mr. Baker said the practice was new to him, but he must bow to the Coroner's decision.

The Coroner then summed up the evidence. He said that the case was a very simple one. It was unnecessary for the jury to enter into any controversy, as to whether or not erysipelas had been caused by the vaccination. It was sufficient to find that death arose from natural causes, for erysipelas was called a natural disease. It was for the jury, then, to say, after considering the evidence of the medical gentlemen, whether they were satisfied that it arose from vaccination, or from the burn. If they thought it arose from vaccination, they were justified in adding that to their verdict. On the other hand, if they had a doubt as to this point, they were justified in saying that the child died from erysipelas, but that the evidence did not show from what cause it arose.

The jury retired to consider their verdict. After a short interval the Coroner was sent for by the jury. On his return into court,

Mr. Baker said that some of those present objected to his seeing the jury except in open court.

Ald. Tatham.—We should have preferred that the jury had come here.

The Coroner said that it was the jury's request and he did not know what they wished to ask him.

Ald. Tatham.—That is what we do not know.

The Coroner said that if they were assuming that there was any party feeling in the matter, he would have the jury called into the court and explain what took place.

Ald. Tatham.—It would be more satisfactory to the public outside.

When the jury returned into court, the Coroner explained that the jury had asked him about the wording of their verdict, and he directed them as before, that it was not compulsory upon them to state what produced erysipelas.

The jury found that Ann Elizabeth Perkins died from erysipelas, but the primary cause of the erysipelas they could not agree upon.

(*Another account.*)

Mr. Scattergood, surgeon, was the next witness. He deposed that, at the request of the Coroner, he had made a *post-mortem* examination of the body of the deceased. The skin was of a yellowish colour, with patches of bright red on the arms and legs, and darker red in other parts. On the left arm there were three vaccination marks, dry, and without scabs. Immediately below the point of the left elbow there was a place about a third of an inch in diameter with the cuticle off and the skin slightly ulcerated. He was told that was the place which had been burned. On the right arm, just above the elbow, there was a place with the skin off about a square in extent, and looking dark and sloughy. There was a slight blistering on the left leg, and buttock, and left ear. On removing the scalp on the right side, there was some reddening and some effusion of watery fluid beneath. There was no disease in any of the internal organs. The brain, lungs, and liver had rather less blood in them than usual. There was a little serum in the ventricles of the brain.

The Coroner.—Can you form an opinion from the examination you have made as to the cause of death?—Judging from the appearances of the skin, and the absence of appearances in the internal organs, I should suppose that death resulted from erysipelas.

Can you go further and say what has produced the erysipelas?—There was nothing in the appearance of the body to enable me to state positively.

Do the symptoms show blood-poisoning?—No, sir. I ought to have added, with regard to the *post-mortem* appearances, that there was no swelling or enlargement of the glands under the armpit, or in the neck, and no inflammation or other indication of blood-poisoning.

You put it as a simple case of erysipelas, but from what it arose you cannot say?—I cannot say.

Mr. Baker.—I think you say that the burn had nothing to do with it?—I do not say anything of the kind. My answer was that there was what I was told was a burn, and there were vaccination marks, but there was nothing in my examination to lead me to say from which of those erysipelas had arisen.

Do you think erysipelas might arise from the burn?—I think it is quite possible that erysipelas might arise from such a burn as that.

I understood you to say that you could not form any opinion as to what caused erysipelas?—I stick to the words I gave; and will you please take my answer. I decline to give any other. I say such a burn might cause erysipelas.

But you had not come to that conclusion before I put the question?—Oh, yes, certainly.

You have had considerable experience in vaccination?—I have had the experience of my private practice, and as a public vaccinator in early days.

Is it not a fact that Dr. Jenner asserted that erysipelas, if not always following vaccination, was very generally the consequence of it?—I do not know that he said that, I am sure. I know from my own experience that erysipelas is sometimes the result of vaccination.

The Coroner.—I take it that erysipelas might arise from many causes, vaccination being one?—Certainly.

Mr. Baker.—Did I not understand you that you were unable to suggest any cause for erysipelas?—I adhere most strictly to the words of my answer, and object to any other being put into my mouth.

Is erysipelas ever the natural effect of vaccination in your opinion?—Certainly it is, and in my own experience.

And in this case vaccination was performed and erysipelas followed it? Is that a fact?—I have heard the evidence and so have you. I am strictly adhering to the *post-mortem* examination, and not giving an opinion upon the evidence, because the Coroner has not asked me to do so.

In answer to the Foreman of the Jury, *Mr. Scattergood* said: I think it much more likely that erysipelas will follow vaccination when there is rubbing of the vesicles or exposure to the air than when there is not. I think atmospheric causes might bring about erysipelas. I freely confess that erysipelas may follow vaccination, and we may be unable to assign any other cause whatever—vaccination which has been performed with as good lymph as can be obtained, and with as much care as can be used both then and in the subsequent treatment. That has followed in the case of a child of my own, where the court may be sure I used the utmost care, and in that case erysipelas followed vaccination and was caused by it.

Case 180, reported to the Commission by the Father of the Child.

Case of C. F. E.: report to the Commission of Dr. Theodore Dyke Acland.

Vaccination. C. F. E., aged two months, of ——, was vaccinated by Dr. W. S. S., Public Vaccinator, on the 21st October 1887.

Alleged injury. Purulent ophthalmia; ulceration of corneæ; blindness.'

Source of lymph. According to Mrs. E., the mother, direct from the arm of A. C., of ——. At the time of my visit (August 1892) the vaccination register could not be found and I had to rely upon the statements of Mr. and Mrs. E., the father and mother of the child C. F. E., as to the source of lymph. Subsequent inquiry showed these statements to be correct.

Vaccinifer. A. C., the vaccinifer, now five years old, is a sturdy, healthy-looking boy. He has three normal cicatrices on his arm at the point of vaccination. The mother states that a few days after the lymph was taken a red rash came out all over the child's body. This was followed by much discharge, especially over the forehead, and Mrs. C., the mother, states that constant attention was paid to the eruption on the forehead in order to prevent the discharge from irritating the eyes. This is corroborated by Dr. F., who attended the child. The eruption gradually subsided, and although the child is said to have been ailing for six weeks the arm healed well, and the child recovered without further complication. Dr. F. informs me that he has attended Mr. and Mrs. C. and their family for some time, that as far as he knows they are healthy, and that neither they nor any of the children have ever shown any sign of syphilis. Mrs. C.'s family history is, however, bad. She has lost six sisters from consumption, though, as far as I was able to ascertain, none of her own children had suffered from tubercular disease. Two have died; one, it is said, of measles and one of bronchitis. I was not able to ascertain that there was any truth in a statement made by Mrs. E., the mother of the child C. F. E., that the C. family suffered from affections of their eyes beyond the fact that one of the brothers of Mr. C., the father of the vaccinifer A. C., is myopic and one has cataract.

Co-vaccinees. Five; Nos. 478–482 in the register. They were inspected by Dr. W. S. S. on the eighth day, the 28th October 1887, and according to the register vaccination was then normal in all of them. The Vaccination Officer has ascertained that of these five children two, Nos. 481 and 478, are now (August 1892) dead. The former died on the 29th March 1888, nine months after vaccination, aged ten months, the certified cause of death being "bronchitis, "4 days; convulsions, 3 hours." The latter died eleven months after vaccination, aged sixteen months, of "inflammation." In both cases vaccination had been without complication of any kind.

[*Note.*—On the same day five other children, Nos. 484–488, were vaccinated from two other vaccinifers, Nos. 473 and 456. One of these five, No. 485, is in Dr. Barnardo's Home, and was well when last heard of; the child is illegitimate and the mother is syphilitic, but no children were vaccinated from him. In the other children vaccination was uncomplicated; they all have four scars, except one, No. 487, who has three.]

Sub-vaccinees. None.

Course of vaccination and illness. Mrs. E., the mother, states that her child's arm became inflamed before the eighth day, and that there was a great deal of discharge from the wound. This statement is not corroborated by the vaccination register, in which it is stated that on the eighth day vaccination was successful, and there is no note as to any abnormal symptoms. It is, however, certain that soon after the eighth day there was a considerable amount of discharge from the wound, the four vesicles becoming covered with one scab and being surrounded with considerable inflammation. The mother further states that sores were caused on the arm by direct inoculation with pus from the suppurating vaccination wounds. (Mrs. E., the mother, also states that her finger was inoculated from the wound, and that she suffered considerably from consequent inflammation.) Subsequently a vesicular rash appeared, which was especially thick over the head and face. There was a good deal of discharge from it, the discharge drying and forming thick crusts with much purulent secretion beneath them. These crusts covered the eyelids. At this distance of time it is not possible to fix the exact date of this eruption. The mother states that the inflammation of the eyes commenced at *latest* during the third week after vaccination, and that it had not existed more than seven or eight days before the child was seen by Mr. T., of ——. This appears, however, to be incorrect, since the child was vaccinated on the 21st October, and was not seen by Mr. T. until the 29th November (five and a half weeks after vaccination), so that it is probable that the inflammation was of longer duration than Mrs. E. supposes, or that it commenced at a later date. Such evidence as I have been able to gather tends to show that at the commencement Mrs. E. did not appreciate the gravity of the affection to the child's eyes, and she herself informs me that she would not allow Dr. W. S. S. to examine the eyes on the first occasion on which he desired to do so; and it would seem probable that the eyes had at that time been affected for some days. There is a good deal of discrepancy between the statements made by Mrs. E. and Dr. W. S. S. with regard to the treatment of the ophthalmia at its onset. According to Dr. W. S. S.'s account he began to treat it vigorously as soon as he was permitted to examine the child's eyes; and as far as I have been able to ascertain, I am of opinion that his statement is correct, and that if there was any neglect in the treatment of the eyes it was due to Mrs. E.'s not being aware of the importance of rigorously carrying out the directions which were given to her; but at this distance of time it is a matter of great difficulty to get any precise or intelligible account of the sequence of events.

On Saturday, 26th November, five weeks after vaccination, the child was seen by Dr. P. in consultation with Dr. W. S. S. He found that the child was suffering from purulent ophthalmia, that there was perforation of the corneæ, and that sight was practically destroyed. He did not think that anything could be done to save the eyes, but advised Mrs. E. to take her child to —— for advice. Mr. T. writes: "The case is entered in my out-patient "book as one of ophthalmia neo-natorum, though strictly "speaking it was not, since I have a note 'both eyes "'lost apparently, corneæ opaque and perforated, eye "'only began to get bad eleven days ago.'" He further informs me that his note threw no light upon the cause of the ophthalmia, it merely recorded the fact that the child's eyes had been affected for nearly a fortnight before he was brought to the Eye Infirmary, and he expresses his opinion that there is no reason why the ophthalmia should not have been produced by direct contact with the suppurating vesicles.

Present condition. The child at the present time is delicate looking but fairly well nourished, with slight signs of rickets. There are four soft rather large cicatrices at the point of vaccina-

tion, with two large and many small scars on the upper arm and shoulder, caused, according to the mother's statement, by the discharging sores resulting from the inoculation from the suppurating vaccination wounds. Their appearance is compatible with this view. There are a few small hard glands in the neck, but none in the axilla. The right cornea is entirely destroyed. The left is in a large measure destroyed and is very opaque, and there is also a large anterior staphyloma. The child can just perceive light, but cannot distinguish objects, so that sight is practically destroyed.

A shield was used to protect the vaccination wound, but Mrs. E. says that she is certain that it was not used until after the arm had become inflamed and the vesicles were discharging; this statement is corroborated both by the person who procured the shield and the person who lent it. It had been used on a previous occasion by a Mrs. M., of ——, whose child had been vaccinated some weeks previously to the infant C. F. E. The vaccination in this case pursued a normal course, and there was no suppuration of wounds, which healed well and quickly. The shield was well washed by Mrs. E., but the linen covering the wires was not changed.

Satisfactory.

Satisfactory.

It is important to note that there is no evidence to show that the child was afflicted with ophthalmia before vaccination. Both Dr. P., who attended Mrs. E. at her confinement, and Dr. W. S. S., who vaccinated the child, are of opinion that when the child was vaccinated it was well. I have not been able to elicit any fact in corroboration of the view that the child's condition was due to any disease inherited or contracted from its parents, or inoculated at the time of vaccination as suggested by Mr. E., the father.

Good as far as could be ascertained. Mother not strong; she is shortly expecting her confinement. Father not robust, but believed to be free from organic disease. The other four children are well, none of them have had ophthalmia or any discharge from their eyes.

C. F. E. suffered from purulent ophthalmia, perforation of corneæ, and consequent blindness. There is good ground for believing that the ophthalmia commenced within four weeks of vaccination, and that it was preceded by suppuration of the vaccination wounds and eruption like impetigo both on the arms, scalp, forehead, and eyelids. Under these circumstances it is probable that the eyes were inoculated with purulent discharge either directly from the vaccination wounds or from the impetigo. Whether such inoculation might have been prevented by proper care on the part of the mother cannot at this distance of time be certainly determined, but the evidence tends to show that at the onset of the eruption no steps were taken by her to prevent infection of the eyes, and that they were permitted to become encrusted with discharge, and to remain in this condition for some days before any active treatment was resorted to.

I have been unable to ascertain any external cause for the suppuration of the vaccination vesicles unless it were due to the lymph. It should be noted that the vaccinifer shortly after the lymph was taken from his arm is said to have suffered from an eruption apparently of impetigo and similar in character to that which affected the child C. F. E.

[*Note.*—See Case CXVIII., page 41, in which purulent ophthalmia occurred about fourteen days after vaccination.]

THEODORE DYKE ACLAND, M.D.

CASE 181 [SERIES], REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of F. J. P. and others: report to the Commission of Dr. Theodore Dyke Acland.

F. J. P., of ——, (No. 15 in the register), was vaccinated by Dr. T. S. J., of ——, Public Vaccinator on the 30th June 1892. *Vaccination.*

19th July 1892. *Death.*

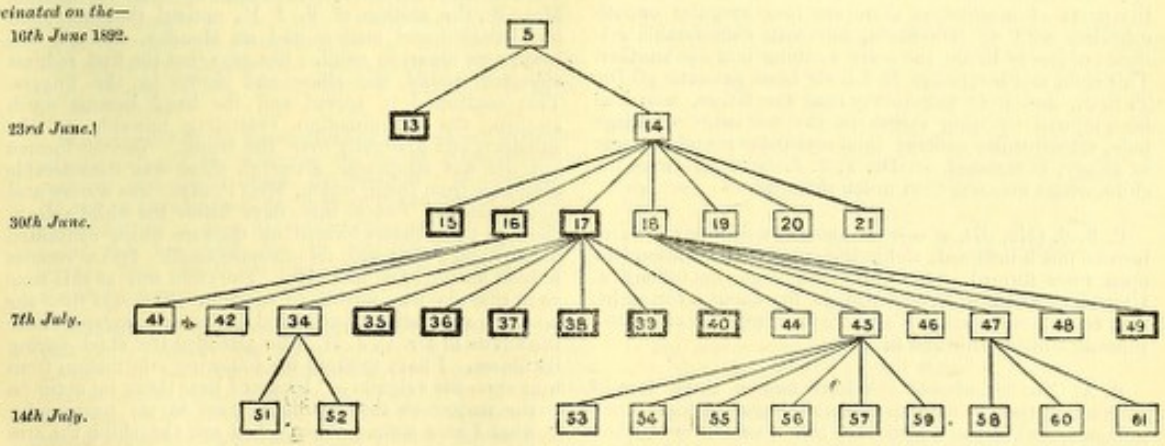
"Erysipelas; asthenia." *Certified cause.*

Dr. C. J. H., of ——. *Certified by.*

[*Note.*—The local registrar, Dr. T. S. J., forwarded information of this case to the Local Government Board because he himself had on the 30th June vaccinated the infant in his capacity of Public Vaccinator. He added that neither the medical man who certified the death nor the parents appeared to blame the vaccination.]

Direct from the arm of M. S. (No. 14 in the register), then of ——, since removed to ——. *Source of lymph.*

For convenience a diagram is appended showing the connexion of the cases vaccinated by Dr. T. S. J. on the 16th, 23rd, and 30th June, and the 7th and 14th July 1892.



M. S. (No. 14), when I saw him on the 30th September 1892, was in good health. His mother stated that vaccination was normal, that he did not ail at the time, that the arm was not inflamed, and that the wounds were well by the third week. There are now four small reddish cicatrices, healthy looking, without induration, and giving no evidence of undue inflammation. As far as I could ascertain there was no reason why the child should not have been selected as a vaccinifer. M. S. was one of two children vaccinated on the 23rd June from E. W. (No. 5 in the register), of ——. *Vaccinifer of vaccinifer.*

Vaccination in the case of E. W. (No. 5) was without complication. There are four normal cicatrices. On the 9th September when I saw the child she seemed in excellent health.

H. H. (No. 13), of ——, the second child vaccinated from E. W. had considerable inflammation (from shoulder to elbow) round the vesicles during the second week, and there was much swelling of the glands in the axilla. No abscess formed. The child was out at nurse in consequence of the illness of his mother and the arm had not *Co-vaccinee of vaccinifer.*

healed when the person in whose care he had been lost sight of him.

Co-vaccinees of F. J. P. (No. 15).

Six. On the 30th June seven children (Nos. 15–21) were vaccinated from No. 14. The course of the vaccination and illness of F. J. P., the subject of this report, is stated below. Of the remaining six, the arms of two, Nos. 16 and 17, showed an undue amount of inflammation. The other four vaccinations pursued a normal course. I have seen all these children. They are as follows:—

N. S. (No. 16), of ——. During the second week after vaccination the arm was considerably inflamed. The inflammation lasted for about a week. There was some discharge from the vesicles, not offensive; no abscess formed round them nor in axilla. There are now four healthy cicatrices, and the child is well.

M. C. B. (No. 17), of ——. Erythema began to spread round the vesicles about the eighth day, and on the 10th day the arm was much inflamed with offensive discharge from the pocks. This continued for three or four weeks, and the child has been an out-patient at the —— Hospital for Children until now (30th November 1892) under the care of Dr. S. H. B., who informs me that when he first saw the child she had "four small unhealthy ulcers "on the upper part of the arm in the usual situation for "vaccination; these healed up rapidly with simple treat-"ment (boracic fomentations). After this the child "developed some pustules of impetigo contagiosa, which "yielded to hydrarg. ox. flav. locally." There are four elongated cicatrices, showing that there has been some loss of tissue. There are also scars on the left forearm and some impetigo on the head. The child is otherwise fairly well.

In Nos. 18, 19, 20, and 21 vaccination was without complication, and the cicatrices are normal in all.

Sub-vaccinees of No. 17.

On the 7th July seven children (Nos. 34–40) were vaccinated from M. C. B. (No. 17), one of the co-vaccinees of the child F. J. P. Of these, six (Nos. 35–40) pursued an abnormal course; vaccination in one case (No. 34) being without complication.

G. H. (No. 35), of ——, since removed to ——. Mrs. P., who now occupies the first-mentioned house, informed me that G. H.'s arm was much inflamed after vaccination, and was not well when the child left. This date I was unable to ascertain with precision, but the case was known by Dr. T. S. J. to have been abnormal.

F. M. (No. 36), of ——. After the eighth day there was much inflammation round the vesicles, which spread to the fingers but not to the body. Subsequently a large ulcer formed, which discharged freely and which did not heal for a month. No abscess formed in the axilla, but one open sore formed on the elbow, which is now well. At the point of inoculation there are four irregular smooth cicatrices with no induration, but with considerable evidence of loss of tissue, the scars running into one another. This child and his father had both been patients of Dr. T. S. J., and it is noteworthy that the father, who had been injured by being struck in the face with a carriage pole, subsequently suffered from erysipelas round the seat of injury, contracted, so Dr. T. S. J. believes, from the child, whose arm was then much inflamed.

E. F. S. (No. 37), of ——. About the fifth day the arm became much inflamed, and at the point of vaccination four open sores formed, with much discharge, not offensive. Ulceration is said to have continued for about a fortnight. The child is now well. There are four irregular cicatrices, showing considerable loss of tissue.

R. A. (No. 38), of —— Within two or three days of vaccination (precise date uncertain) the arm became much inflamed, and by the eighth day the vesicles were broken and discharging. The wounds stuck to the night dress two or three times in the first week, and there was considerable ulceration round the seat of inoculation. The inflammation extended from shoulder to elbow. No scabs formed for a month. Mrs. A., the mother, states that she made no application to the arm except under medical advice; this she did not obtain until the eighth day, when boracic acid ointment and vaseline were ordered and applied. No shield was used, and Mrs. A. says that she removed the sleeve of the child's dress entirely at first so as to avoid rubbing the vesicles. There was no general eruption, and no glandular enlargement or abscess. There are now four scars, one small and regular, the three others have practically coalesced, and round the cicatrix there is a zone of scarred tissue, showing that there had been considerable surrounding inflammation. The child, who is now well, is dirty, and the house is filthy.

E. L. N. (No. 39), of ——, suffered towards the end of July from erysipelas, which was, however, limited to the vaccinated arm. There was some ulceration of the vesicles, but no abscess formed. The parents inform me that the child has now (3rd October 1892) entirely recovered.

B. M. (No. 40), of ——. The formation of the vesicles in this case appears to have been delayed; according to the mother's statement they were not mature by the eighth day, and were not fully formed until the middle of the second week. The arm subsequently became inflamed and swelled from shoulder to elbow. Bread poultices were applied for 24 hours by the advice of a chemist who saw the arm. The vesicles ulcerated and discharged considerably. There was slight enlargement of the axillary glands, but no abscess. The wounds were healed in a month. There are now (30th September 1892) three large scars, one of which is irregular. There is no induration round them nor of the glands in the axilla. The child is well.

Sub-vaccinees of No. 18.

On the 7th July six children (Nos. 44–49) were vaccinated from F. K. (No. 18), another co-vaccinee of the child F. J. P. These children I have seen, and find that in five (Nos. 44–48) vaccination pursued a normal course without complication, and they are now well. In one (No. 49) vaccination was abnormal.

M. D. W. (No. 49) is believed to have been well up to the time of inspection. On that day she was *brought up to the vaccination station by the mother, who was nursing a case of scarlet fever at home.* A few days later the arm became seriously inflamed, the vesicles suppurated, and there was much offensive discharge. The inflammation did not extend to the body, but three or four pustules formed on leg and neck, which discharged. The ulcers remained unhealed for six weeks. The mother informed me that the vesicles were not rubbed, as far as she knows, that she used no shield, and made no application to the wounds except under medical advice.

Sub-vaccinees of No. 16.

On the 7th July two other children (Nos. 41 and 42) were vaccinated from N. S. (No. 16), another of the child F. J. P.'s co-vaccinees. Vaccination in both cases was normal. The mother of one of these children, J. W. W. (No. 42), who nursed the child and who brought him up to the station, had an ulcerated leg at the time, which was much inflamed but believed not to be erysipelatous. In consequence, however, of her state of health and of the feeble health of the child, she requested that no lymph might be taken from its arm for other vaccinations.

Sub-vaccinees of F. J. P. (No. 15).

None; the child was not brought up for inspection.

Course of vaccination and illness.

On Sunday, the 3rd July, the third day after vaccination, Mrs. P., the mother of F. J. P., noticed that her child was irritable and restless, and on Monday, the 4th, the lower arm began to swell. She says that the first redness appeared round the elbow and down to the fingers. This continued to spread and the hand became much swollen, the inflammation extending upwards to the shoulder, and gradually over the trunk. Vesicles formed but did not suppurate, although there was considerable discharge from them, which, Mrs. P. says, was watery and not purulent. Two or three days before the child's death she says that blisters formed on the hips which contained blood-stained fluid with an offensive smell. Other vesicles formed on the back and side. The child was at this time so ill that she was unable to move it. She says that she made no application of any kind to the arm, except under the advice of Dr. C. J. H., who attended the child during its illness. I have received the following information from him upon the subject:—"I regret I have taken no notes on "the matter, so that I entirely trust to my memory for "what I here state. When I first saw the child the arm "from the finger tips to the shoulder was red and swollen "with the erysipelatous rash. The rash was then "encroaching on the neck. The vesicles had the appearance "of health, but subsequently, when the scab separated, "developed into ulcerating sores. The erysipelas then "spread over the whole body, and two large sanguineous "bullæ formed on the buttocks, which burst and dis-"charged offensive pus; they finally developed into "ulcerating surfaces. The conclusion I came to was that "the poison had been contracted subsequently to vac-"cination, as I gathered from the mother that there was "no redness to speak of around the vesicles until they "had become fully formed. I thought possibly they had "been rubbed with some of the body linen which may

" have been dirty, as the mother had a poor home, a large " family, and the house showed some want of cleanliness ; " and I knew Dr. T. S. J. to have had large experience. " You state in your letter I attended within three days of " the vaccination, but I am not clear on the point, but " believe quite a week had elapsed."

The child was not seen again by Dr. T. S. J. until the 15th July, four days before her death. He says that the vesicles were then free from redness, and that the child was being attended by Dr. C. J. H. for erysipelas. He states that the left hand was swollen but free from redness, and that the child died from exhaustion caused by fever and bed sores on the 19th July. He further adds that the vesicles when seen by him appeared to have been unaffected by the inflammation which had passed over them, that there was no sloughing or abscess, that they were not unduly prominent and were drying up; they looked like a vaccination of nine days' standing without the areola. He considered that the erysipelas was merely concurrent and not consequent upon vaccination.

I was unable to see Dr. T. S. J. vaccinate, but he states that as far as his instruments are concerned he is very careful. With regard to this statement I should say that he vaccinates with an ordinary lancet, which he carries about in his pocket; and that when I saw it, it was extremely blunt, the point having been broken off. It was not in the condition which such an instrument should be. He assured me that it was washed before commencing to vaccinate and between each operation.

As far as is known, good.

Nothing of importance was elicited. There are eight children living. Two, besides F. J. P., have died ; one of diphtheria, and one after osteotomy.

The house is filthy, very close, and stuffy ; the parents are evidently nearly destitute. There is said to have been no case of illness in the house at the time.

Dr. T. S. J. informs me in a letter that there was a good deal of erysipelas about in the neighbourhood at the time. He also tells me that he attended cases of erysipelas on the 14th June and the 10th and 15th July, but not on the 30th June when F. J. P. was vaccinated.

F. J. P. died of erysipelas spreading from the vaccination wounds, and from the history of the case it would seem probable that the erysipelas was the direct result either of vaccination or of some circumstance which occurred at the surgery on the 30th June, the day on which vaccination was performed.

In support of the view that the erysipelas was directly due to the vaccination, attention may be drawn to the fact that two other children vaccinated at the same time and directly after F. J. P., viz., Nos. 16 and 17, both suffered from abnormal inflammation round the vesicles ; but I have been unable to elicit any facts with reference to No. 14, the vaccinifer of these three cases, which would lead to the supposition that his vaccination pursued an abnormal course or that he was other than a fit subject from whom to take lymph.

With regard to the possibilities of unexpected infection, attention should be called to the entire disregard of all ordinary precaution shown by Mrs. W., the mother of No. 49, in coming with her baby to the vaccination station straight from a case of scarlet fever; and it should be noted that her child, No. 49, was the only one of the group, Nos. 44–49, whose vaccination presented any abnormal symptons.

Although, as has been said, the evidence tends to show that the erysipelas was probably directly due to the vaccination or to some circumstance that occurred at the station on the 30th June, the fact cannot be disregarded that the child's home was so dirty that an open wound could not fail to be a source of more than ordinary danger.

In the case of the seven children (Nos. 34–40) vaccinated on the 7th July from M. C. B. (No. 17), a co-vaccinee of the child F. J. P., it can hardly be doubted that the abnormal results were due to the quality of the lymph. None of the six children in this group whose vaccinations were abnormal were used as vaccinifers. I have seen or made inquiries with regard to the cases vaccinated from No. 34 (the only normal case in this group), and the other cases vaccinated on the 14th July who were indirectly connected with the subject of this report, but I have obtained no evidence that the vaccinations were followed by any complications, nor do the results seem to throw additional light upon the case of the child F. J. P.

In this inquiry I have been greatly assisted by Dr. T. S. J. and by the Vaccination Officer, Mr. L., who has succeeded in tracing many of the children who had removed from the addresses given.

THEODORE DYKE ACLAND, M.D.

CASE 182, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD

Case of E. L. C. Copy of the depositions taken at an Inquest held on the body of E. L. C., and of the verdict returned by the Jury.

Information of witnesses severally taken and acknowledged on behalf of our Sovereign Lady the Queen, touching the death of E. L. C., at ——, on the 29th day of July 1892, before me W. C., Her Majesty's Coroner for ——, on view of the Body of the said person then and there lying dead :—

H. C. on her Oath saith :

I am the wife of E. C., an engineer, and live at ——. The deceased, E. L. C., was my child. She was three months old. On Wednesday morning last the deceased did not seem well, and I sent my mother for the doctor. Dr. C. came directly. He told me to give the child a little brandy and milk to moisten the lips, and he would send another doctor or come himself. Dr. M. F. came about an hour afterwards, and he said the child was certainly dying, and he could not see clearly what was the cause of death. I kept on with the brandy and milk up to the time of her death at 5.30 on Wednesday evening last. The child was fed on cow's milk and water. The child was vaccinated yesterday three weeks by Dr. A., the Public Vaccinator, at the station at ——. The vaccination did not rise very much. It came to a small head. I took the child to Dr. A. again yesterday fortnight; he looked at the child and said it was a weakly child. The child was born to time, and has got thinner since birth. The child had a little cough. She took her milk all right. I have seven children living. The deceased's life was not insured.

By the Jury :

I could not suckle the child as it was tongue-tied. Dr. C. operated on the child. I could not get her to take the breast. The child seemed pretty well when vaccinated. She was thin. There was no threat held out to me if I did not get the child vaccinated.

H. C.

M. F. on his Oath saith :—

I am a duly registered medical practitioner in charge of Dr. O'M.'s practice while he is away on his holidays. Mr. C. is not a qualified medical man, and he asked me to attend to the case. I went on Wednesday last about 1 p.m. to see the deceased, and found her in a dying state. I made a superficial examination of the deceased. The heart was beating very slowly. The breathing slow and gasping. I saw nothing externally to account for the illness except from inflammation of the eyelid. One eye was closed and one was open. The body was slightly emaciated. Round the place of vaccination it was inflamed.

M. F.

The before-written depositions of H. C. and M. F. were severally taken on Oath this 29th day of July 1892, before me,
W. C., Coroner.

(*Adjourned until the 4th August 1892 for post-mortem examination.*)

At the adjourned Inquisition held on the 4th day of August 1892 :

M. F. on his Oath further saith :

I have made a post-mortem examination of the body of E. L. C. I found the body healthy. The brain was healthy. On the heart there was a small fatty tumour, and one on the right side of the heart. Surrounding the

heart there was a good deal of fluid. I think the cause of death was inflammation of the pericardium of the heart. The child was not well nourished. There was no food in the stomach. A very little fluid. The liver was a little congested, and so were the kidneys. There was nothing to show that the vaccination had anything to do with death.

M. F.

The before-written deposition was taken on Oath this 4th day of August 1892, before me,

W. C., Coroner.

Verdict.

That the said E. L. C., of the age of three months, on the twenty-seventh day of July in the year of Our Lord One Thousand Eight Hundred and Ninety-two, died from natural causes, namely, inflammation of the pericardium.

Case 183, reported to the Commission by the Local Government Board.

Case of J. J. M.: report to the Commission of Dr. Arthur Pearson Luff.

At the request of the Commission I have made a thorough investigation into the circumstances attending the death of J. J. M., aged 13 months, of ——, who died on the 23rd July 1892.

From the depositions taken at an inquest held in the case on the 26th July 1892 by Mr. E. N. W., Deputy Coroner for ——, I have obtained the following information:

Depositions at inquest. S. J. M., of ——, the mother of the child J. J. M., gave evidence to the effect that the deceased was a healthy child up to the time that he was vaccinated on the 27th June 1892. She did not wish him to be vaccinated, and therefore postponed it as long as she could. She received a notice from the Vaccination Officer to have him vaccinated when he was about three months old, but did not do so, as she was going away hopping. She went on three Mondays to Dr. J. J. I., the Public Vaccinator, to have the child vaccinated, and he told her, on the first two occasions, that he was not quite satisfied with the stuff he had. She again took the deceased to him on the 27th June, when he told her that he had some fresh stuff, and vaccinated the child. For about eight days after vaccination the child was ill, and she took him again to Dr. J. J. I. on the 19th July, 19 days after vaccination. As the child was then getting worse, Dr. J. J. I. told her to poultice the arm, and gave her some linseed meal for the purpose, but she did not use it. Dr. J. J. I. came to see the child every day, but it got worse, and on the 23rd July, *i.e.*, 26 days after vaccination, the child died.

Post-mortem examination. The evidence of Dr. D. N. R. was to the effect that he was at present living with Dr. B. at ——, and was acting as locum tenens for Dr. J. J. I., who was away. He had that day made a post-mortem examination of the body of the deceased. It was fairly well nourished and was not very much wasted. There was one large wound on the upper part of the left arm as large as a five-shilling piece; most of the tissues about it had sloughed away, down to the muscles, and the wound had an unhealthy appearance. The brain, liver, kidneys, spleen and heart were all healthy; but in the left lung there were signs of inflammation; the base of the right lung was congested, and there was some purulent fluid in the left pleural cavity. The cause of death was inflammation of the left lung, caused by the unhealthy condition of the vaccination wound. He could not say that the child had been improperly vaccinated, as the wound might have been poisoned by some substance introduced from without. He was strongly of opinion that vaccination should be performed before the period of teething.

Dr. J. J. I., of ——, made a statement to the effect that he vaccinated deceased on the 27th June from some calf lymph which he received from Messrs. C. S. & Co. He had used lymph received from them for the last four or five years without any mishap. The child seemed healthy when vaccinated. He saw the deceased again on the 4th July, seven days after vaccination, when there were four very mild pustules on the left arm, and he was quite satisfied with the operation. The child was brought to him again on the 7th July, ten days after vaccination, when it was suffering from phlegmonous erysipelas over the belly and back. He attributed this partly to want of attention on the part of the mother, as she ought to have brought the child to him directly the erysipelas appeared. The erysipelas in his opinion was caused by blood-poisoning. There may have been something from outside to cause blood-poisoning, but he thought there was nothing wrong with the lymph he had used.

Verdict of jury. "The deceased died from pneumonia, consequent on "the unhealthy state of the wound on the left arm, the "result of vaccination, which we believe to have been pro-"perly performed."

I have since visited the mother and doctors concerned in this case, and the following are the results of my investigation:—

The mother informs me that the child was, in her opinion, a healthy one, and was vaccinated in four places. The child seemed well until about the tenth day after vaccination, when the arm became hard and red around the vaccination spots and half-way down to the elbow. About the eighteenth day after vaccination the four places seemed to run together, and form one large place. She did not notice any discharge from it. The child took the breast up to within two days of his death. No person in the house at the time was suffering from any wound, and there was no case of erysipelas or fever in the vicinity, as far as she knew.

From my own inspection of the house, I found that the sanitary arrangements were fairly good, the closet being a Hopper one, with a good water supply.

In a letter received from Dr. J. J. I. on the 4th November 1892, in answer to questions put by me, he informed me:

(*a.*) That no other children were successfully vaccinated from the lymph used to vaccinate deceased on the 27th June, but that on the 4th July another child was vaccinated from deceased, and this child did well.

(*b.*) The rash upon deceased when seen by him on the tenth day after vaccination was most certainly erysipelas and the skin was brawny and indurated in the neighbourhood of the vaccination pustules, and extended over the clavicle. The temperature was raised at the time, and the child suffered from vomiting, but not from convulsions.

(*c.*) There was no erysipelas in the house or neighbourhood at the time to his knowledge. The mother had a bad name for want of cleanliness.

At an interview that I had with Dr. J. J. I. he stated that the deceased when seen by him seven days after vaccination was then in very good health, and on that occasion he vaccinated a child, S. E. R., of ——, from the arm of the deceased.

Sub-vaccinee. I have seen this child S. E. R., and she is in a healthy condition, and neither at the time of vaccination nor since has suffered any inconvenience from vaccination.

Dr. J. J. I. informs me that in the case of the child J. J. M., the erysipelas supervened somewhere between the seventh and the tenth days after vaccination, that he attended for the erysipelas at home, and that the arm gradually got worse. He knew of no case of erysipelas in the neighbourhood at the time, and the sanitary condition of the houses around was considered good.

Dr. D. N. R., who made the post-mortem examination, in answer to a letter sent by me, informed me that the skin around the wound was thickened, and there was no appearance of granulations at the edges of the wound or elsewhere. The ulceration was deep, and laid bare part of the deltoid muscle. The skin and cellular tissue round the wound were softened down to the subjacent muscles for at least an inch. There was no abscess in the axilla. In the left pleural cavity there were two or three drachms of semi-purulent fluid. There was nothing in the shape of a metastatic abscess in the kidneys, liver, spleen, or lungs; those organs appeared to him to be healthy. The wound on the left arm was in a gangrenous condition, and he regarded the pneumonia of the left lung as being septic in origin, and due to absorption of septic matter from the vaccination wound.

In this case it appears that vaccination went on well until the eighth day, and that between this and the tenth day, erysipelas supervened, in consequence of which the wound got into a gangrenous condition. The child, no doubt, died from septicæmia, due to absorption of septic matter from the wound; the final cause of death being, in the opinion of the medical man who made the post-mortem examination, septic pneumonia.

ARTHUR PEARSON LUFF, M.D.

CASE 184, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of F. N. T.: report to the Commission of Dr. Theodore Dyke Acland.

F. N. T., aged six months, of ——, was vaccinated by Mr. H. T., M.R.C.S., Public Vaccinator for ——, on Monday, the 8th August 1892.

26th August 1892.

"Erysipelas following vaccination, one week."

Mr. H. T., the Public Vaccinator.

From the arm of C. S., who was vaccinated on the 16th May 1892. The lymph was stored in capillary tubes.

C. S. was, at the date of my visit (22nd October 1892), suffering from chicken-pox, and was obviously unwell, but until this illness she had not ailed anything since the time of her vaccination. Mrs. S., her mother, informed me that the arm was more or less inflamed when the lymph was taken from it, but of this I have been unable to obtain any corroborative evidence. She further stated that the vesicles were not healed for a month, and that there was some enlargement of the glands in the axilla. The child did not suffer then, nor has she since (until attacked with chicken-pox), from any eruption on her body. She has now two large healthy scars, each of which is composed of two of the vesicles, which had coalesced. C. S. was vaccinated direct from the arm of A. D., of —— (No. 489 in the register).

A. D.'s vaccination pursued a normal course, and the arm was entirely healed at the end of three weeks. From May up to the 2nd July the child was in good health. On the latter day it was suddenly taken with symptoms of acute intestinal obstruction due to intussusception; and, notwithstanding operation, he died after only three days' illness.

None.

None.

The statements of Mrs. T., the mother of the child F. N. T., about the child's condition during the first week after vaccination are very contradictory, and do not seem to be reliable. She stated that the arm was "fearfully" inflamed" when she reached home on the day the child was vaccinated, by which, as far as I could make out, meant that the points of insertion were visible. She says that the redness which appeared at first entirely died away before the vesicles formed. As far as she knows during the first week the arm was not rubbed or injured in any way. At the same tine she admits that her other children used to nurse the baby and take it out of the cradle. On the eighth day, when the child was taken for inspection, Mr. H. T. informs me that the vesicles looked as if they had been rubbed, that there were open sores at the points of inoculation, and that the arm was considerably inflamed. Mrs. T., the mother of the child, contradicts this statement, and says that no inflammation appeared on the arm until the following Saturday, the 20th August. It is certain that Mr. H. T. advised treatment before the 20th August, and he informs me that he saw the child several times between the 15th and the 26th (the day on which the child died), and that the treatment of the arm was carried on under his direction. The mother's account is that the child seemed fairly well until Saturday, the 20th August, that it then became restless, and when she uncovered the arm in the morning she found that it was inflamed to the bend of the elbow, and swollen down to the wrist. She states that the child was not seen by Mr. H. T. until Monday, the 22nd August. At that date it is certain it had well-marked erysipelas; vesicles had formed round the points of inoculation and at the elbow, which subsequently burst and discharged. Diffuse inflammation spread rapidly over the body and down the other arm. Great constitutional disturbance followed, and between the 22nd and the 26th August the child had several convulsions. Mrs. T—r, the next-door neighbour, who took the child for inspection on the eighth day, informs me that the child had a vesicular eruption on the back of its neck on the third day after vaccination, and that on the eighth day the scars were covered with a dark scab, and that the scabs did not come off until after the arm had been poulticed. I have been unable to reconcile these conflicting statements as to the condition of the arm, but it seems certain that the vesicles were not normal on the eighth day, and that by the fifteenth day a widely diffused erysipelatous inflammation had spread from them, which eventually proved the primary cause of the child's death.

Treatment of vesicles.

Mr. H. T. is definitely of opinion that the vesicles had been rubbed before he saw the child on the 15th August. No shield was used and no application was made to the arm except under the doctor's direction.

Method of Vaccination.

A mechanical scarifer was used to make the scratches. This instrument consists of four toothed blades actuated by a spring, and is used by Mr. H. T. only for making the scratches. It is open to the grave objection that it is practically impossible to clean the blades without taking the instrument to pieces, and in fact Mr. H. T. does not attempt to clean it between each vaccination. Inasmuch as it was obviously *possible* that erysipelas in the case of the child F. N. T. originated from the use of this instrument, it seemed advisable to inspect not only the child who was vaccinated immediately before him, but also all the children who were vaccinated on the same day. I consequently visited them, and the results were as follows:

G. W. B., of —— (No. 9 in the register, but whose Christian name "G." appears therein as "E."), was the *last* child vaccinated on the 1st August; F. N. T., the subject of this report, being vaccinated *first* on the 8th August. The house where this child G. W. B. lives is offensive in the extreme, not from any particular sanitary defect, but from the general dirt of the house and want of cleanliness of the inmates. The child himself is small, puny, and anæmic, and he is an only child. He has three small reddish scars, two of which have run into one. His aunt, who is nursing him, assures me that there was no inflammation after vaccination, no enlargement of glands, and no eruption. The child has now some slight eczema, especially in the folds of the groins. I was unable to discover any evidence of syphilis either from the appearance of the child or from the history of his parents.

On the 8th August eight children, besides F. N. T., were vaccinated. They were:—

(i.) P. F., of —— (No. 11 in the register). This child I was unable to see as he had left the neighbourhood, but the neighbours reported that vaccination had been successful and that the child was well.

(ii.) H, H., of —— (No. 12). A healthy child; vaccination normal. Four normal scars.

(iii.) E. H., of —— (No. 13). A healthy child; vaccination normal. Four healthy scars.

(iv.) R. S., of —— (No. 14). The child's parents have removed to ——, but the person who is now living in their house informed me that the vaccination presented no irregularity, and that the child was well.

(v.) G. W. C., of —— (No. 15). Vaccination was normal, and the child was well until the 29th August, when it was taken with a sudden attack of diarrhœa, followed by collapse and death. The child had always been delicate, and had had diarrhœa before vaccination on and off for nearly a month.

(vi.) E. T., of —— (No. 16). Vaccination was followed by a certain amount of inflammation and some glandular enlargement. During the second week the arm was inflamed from shoulder to elbow, but there was no rash upon the body, and the arm was entirely healed in three weeks. There are now three scars at the points of four insertions, two of the vesicles having run into one. The child had always been delicate, and at the time of my visit (22nd October 1892) was suffering from extensive eczema on the head and back; this had, however, only existed for a few days.

(vii.) E. W., of —— (No. 17). Vaccination normal; four small, almost invisible scars. The child is well.

(viii.) E. L., of —— (No. 18). Vaccination normal; four small reddish scars. The child is suffering from eczema of the head.

Previous history. The child F. N. T. was the youngest of nine children, and had been delicate from birth. Vaccination was postponed on a previous occasion by Mr. H. T. owing to the state of the child's health. Mrs. T., the mother, did not expect the child to live. She says that the child took very little notice of anybody, always had a cough, and that his extremities looked blue. Mr. H. T. informed me that he considered the child hydrocephalic, and Mrs. T., the mother, states that he had said to her that the child looked as if it had water on the brain. The mother also told me that Mrs. H. T., who saw the child when it was a month old, expressed her surprise that it was alive.

Family history. The mother is a feeble woman and suffers much from bronchitis. She stated that during her pregnancy she was in "dreadful poverty," and during last winter had much worry and anxiety. I was unable to elicit any facts concerning the rest of the family which seemed to have any bearing upon the case.

Sanitary condition. The was no sanitary defect in the house as far as I could discover. There is no direct communication between any of the rooms and the drain. The sink discharges over an open gully, and everything is clean and sweet. The closet is entirely disconnected with the house. There has not lately been any illness in the house or next door.

Conclusion. The child F. N. T. died of erysipelas spreading from the vaccination wounds. There is no evidence to show that the erysipelas was caused either by the use of improper lymph or of the scarifer. None of the other children vaccinated on the same day, and subsequently to F. N. T., suffered in a similar manner. It is clear, from the history of the case, that the child had been exceptionally feeble from the time of its birth, and it is not improbable that the erysipelas was due to the retention of inflammatory products in the wounds, which suppurated after vaccination owing to the low vitality of the tissues.

THEODORE DYKE ACLAND, M.D.

CASE 185, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of A. S.: report to the Commission of Dr. Theodore Dyke Acland.

Vaccination. A. S., aged five months, of ——, was vaccinated in four places by Mr. T. V. D., deputy to Mr. F. G. B., M.R.C.S., Public Vaccinator, on the 2nd August 1892.

Death. 30th August 1892.

Certified cause. "Vaccination; erysipelas."

Certified by. Mr. F. G. B., Public Vaccinator.

Source of lymph. Direct from the arm of G. W. D. (No. 190 in the register).

Vaccinifer. G. W. D. (No. 190) is not a strong looking child, but is said to have been quite well until a month ago when he had diarrhœa; this has now ceased. He has a large head, and dentition has not yet commenced. Vaccination is said to have been without complication. G. W. D. was vaccinated from M. M. Her vaccination was without complication of any kind. She appears to be a delicate child.

Co-vaccinees. None.

Sub-vaccinees. None.

Course of vaccination and illness. Vaccination appeared normal up to the eighth day. The vesicles were then pricked, but no lymph was taken or stored. Two days later (11th August) the mother says the arm began to inflame, and she took the child the next day to Mr. F. G. B.'s surgery. In Mr. F. G. B.'s day-book and visiting list the first date of attendance is entered as the 19th August, not the 12th August. It is possible that when first the child was taken to the surgery it was treated by the assistant as a club-patient, no entry being made in the book. The note in the register of infectious diseases is to the effect that erysipelas commenced 12 days after vaccination. Whatever the date of the commencement of the erysipelas, the mother states that the arm was red from shoulder to elbow by the 10th day, the redness subsequently extending all over the body, fading in one place and appearing in another. Mr. F. G B. has no doubt that the child was suffering from erysipelas when he saw it on the 19th August. There was slight swelling of the axillary glands, but no abscess formed, and the vaccine vesicles did not ulcerate nor suppurate. The child did not rally, and died on the 30th August 1892, twenty-eight days after vaccination.

Treatment of vesicles. Mrs. S., the mother, informs me that she made no application to the vesicles, and did not wipe off the lymph. She says that the scabs were not knocked off or injured. They apparently formed naturally and dried up before the child died.

Method of vaccination. I have not been able to see Mr. T. V. D. vaccinate, but his instruments were in good order at the date of my visit, the 17th April 1893, and the tubes were carefully labelled, and put away in a box kept for that purpose only.

Previous history. Good.

Family history. Said to be good. There had been no recent sickness of any kind, either in the S.'s house or next door. The sanitary condition of the house is above the average, and it is clean and airy.

General surroundings. Vaccination was performed at Mr. F. G. B.'s surgery, in which patients of all kinds congregate. The waiting room is small, and is said to have been very crowded on the morning of the 2nd August, the day on which A. S.'s vaccination was performed.

In the course of my inquiry three separate persons told me that on the morning of the vaccination there was a woman present in the surgery whose breast was full of abscesses; she had brought her child to be vaccinated, and had made considerable complaint about her condition. In consequence of this statement I visited the whole of the children who were vaccinated on the 2nd August with Mr. F. G. B., without finding the woman, and since the date of my visit, Mr. F. G. B. has pursued his inquiries without success. He writes, "The nearest thing I can find in "corroboration of the statement we were trying to verify "is, that Mrs. J. S., of ——, who was suffering from "strumous glands in the neck, and had a piece of red "flannel round her face, had her child T., No. 211 in vaccination register, vaccinated on the same day that Mrs. "S.'s child was up for inspection." In the nine children whom I inspected vaccination had pursued a normal course without complication, and I was not able to discover any case of erysipelas with which it is possible that the child A. S. was brought into contact.

With regard to the occurrence of erysipelas in the district, the returns of the Medical Officer of Health, Mr. F. G. B., show that the deaths from erysipelas during 1892 were far more frequent than in preceding years. They number seven, as against a total of five for the *whole* of the *nine* preceding years. Mr. F. G. B. states in his report under the heading of erysipelas "nineteen cases have "been reported, and seven deaths have occurred, four of "them under five years of age. Out of the cases reported "eight were in children under one year, and three of them "in children under one month. The only death that calls "for special reference took place at ——, after vaccination, and occurred to a child aged four months." (The subject of this report.) "The operation of vaccination "was successfully performed, and on the eighth day the "arm was inspected and found in a satisfactory condition. "Four days after erysipelas appeared in the other arm, "side of head, and face. It affected different parts of the "body consecutively, and ultimately the child died on the "twenty-eighth day. It was, in my opinion, a case of "idiopathic erysipelas, and was not due to vaccination. "The child from whom the lymph was taken was perfectly healthy, and made a good recovery after the "operation."

Conclusion. The child A. S. died of erysipelas spreading from the vaccination wounds. There is no evidence to show that it was invaccinated; neither have I been able to trace any circumstances in the history of the vaccinifer, the vaccinator, or the child's general surroundings which seem to point to a definite source of infection. The plan of vaccinating children in a small surgery where persons suffering from every kind of ailment apply for relief is undesirable, and cannot be unattended with danger, as the infants are thus unavoidably exposed to the risk of infection.

THEODORE DYKE ACLAND, M.D.

CASE 186, REPORTED TO THE COMMISSION BY THE CORONER.

Case of B. I. W.: report to the Commission of Dr. Sidney Coupland.

B. I. W., of ——, was vaccinated when about five months old by Mr. A. B. G., M.R.C.S., of ——, on the 5th April 1892. The child died on the 30th August 1892, and an inquest was held by Mr. C. L. R. on the 2nd September. A copy of the depositions then taken, and of the verdict returned by the jury, is appended to this report.

I visited —— on the 22nd October 1892 and called on Mr. A. B. G., who had vaccinated the child, and attended her during her subsequent illness. He had stated in evidence at the inquest that "the child has died from "marasmus, ensuing upon vaccination."

Mr. A. B. G. informed me that he vaccinated the child with Dr. R.'s calf lymph obtained from Mr. K., chemist, of ——. He thought at the time that the child looked "rickety," and that it was thin, although its mother considered its health to be very good. However, he only made one insertion, "because," he said, "of its not appearing to "be robust." The result of the vaccination was the formation of a well-marked vesicle by the eighth day, without any surrounding inflammation. The subsequent scab, however, remained adherent until the child's death; it was about the size of a threepenny piece.

Mr. A. B. G. always uses a lancet, carefully cleansed, in his vaccinations. There were no other children vaccinated from the same tube of lymph as this case; nor did he use the child as a vaccinifer. Indeed he almost invariably employs calf lymph, owing, he told me, to an objection on the part of parents to arm-to-arm vaccination. He vaccinated three or four other children on the same day (5th April) as B. I. W., from other tubes of lymph, obtained at the same time as that used in this case. In all these children vaccination ran a normal course.

The child's illness commenced "about a week or two" after the vaccination with a convulsion, followed by diarrhœa, which persisted, together with progressive emaciation, until her death. Mr. A. B. G. said that the mother looked after the child carefully, and that there was no ground for an imputation of its having been "starved," which had been made at the time.

From Mrs. W., the mother of the child B. I. W., I learnt that the infant was born on the 8th November 1891, and that it had been always hand-fed, with diluted cow's milk alone. There had been nothing abnormal noticed about the child, which slept well, never had any gastro-intestinal disturbance, and was well developed, so that its mother was "quite proud of her." Dentition had not commenced. During the week after vaccination there had been no appreciable change in the infant's health; its appetite did not fail; there was no trouble with the vaccinated arm. It was shortly after the 12th April (when Mrs. W. took the child for the usual inspection after vaccination) that it was attacked with a "fit," but the precise date of this attack could not be fixed. This ushered in a series of convulsions, and its onset could not be accounted for by the mother. There had been no change in the child's diet; no gastro-intestinal derangement preceded the fits. But on the contrary the fits themselves seemed to be the starting point of such disturbance, for from that time onward it began to suffer from diarrhœa and vomiting. Its condition varied from day to day, "now better, now worse"; but the general tendency was downward, and it became extremely wasted.

Besides this infant, B. I. W., there have been five other children in the family. Two of these died in infancy; one, five years ago, a female, from "consumption" at the age of five months, having suffered from her birth from "dreadful diarrhœa and sickness"; and the other, a male, aged 11 weeks, who died four years ago from bronchitis. The living children, whom I saw, are a girl aged 11 years, a boy aged six years, and a girl aged three years. They are all well developed and healthy looking. The two elder ones were vaccinated at the usual age, and did well after it; the youngest, who had been put out to nurse, had her vaccination postponed because it was ailing at the time, but it was done later successfully. None of these children have had fits.

The father, a lithographic printer, 37 years old, has always had a cough; the mother, 34, has always enjoyed good health. There is no consumption in their family history on either side.

It may be added that the deceased child never had a rash on the skin or snuffles; that Mr. A. B. G. did not think there was any mesenteric disease in its case, and he said he could feel no swelling in the abdomen. There was no post-mortem examination.

Source of lymph.

I called on Mr. K., chemist, in order to trace, if possible, the supply of calf-lymph from which this child was vaccinated. He is an agent for Dr. R., but he only commenced to keep a register of the lymph on the 29th April 1892, *i.e.*, subsequent to the date of this vaccination. He now receives a consignment of six or eight tubes twice a week. Formerly he used to have rather larger consignments from time to time, and it was from one of these supplies that the tubes sent to Mr. A. B. G. on this occasion were furnished. On my return to town I called at Dr. R.'s establishment, and ascertained that he had consigned lymph No. —— to Mr. K. on the 30th March 1892. It was from calf No. —— in his register, and Dr. R. informs me that lymph from this calf was sent to about 800 doctors, and that he had received no report of any bad results following its use.

Conclusion.

I find it difficult to associate the child's fatal illness with the vaccination which so closely preceded its commencement. This illness resembled in character that which proved fatal to another child of the same family five years before, and it began about the period of dentition. Moreover, the infant had been brought up by hand, and in Mr. A. B. G.'s opinion showed evidence of rickets; but I do not think there is sufficient evidence to exclude the possibility of tabes mesenterica. It is to be regretted that no post-mortem examination was made.

SIDNEY COUPLAND, M.D.

(Copy of depositions taken at Inquest and of verdict returned by Jury.)

The Information of Witnesses severally taken and acknowledged on behalf of our Sovereign Lady the Queen, touching the death of B. I. W., at ——, on the 2nd day of September, in the year of our Lord One Thousand Eight Hundred and Ninety-two before me, C. L. R., Gentleman, Her Majesty's Coroner for ———, on an Inquisition then and there taken, on view of the body of the said B. I. W. then and there lying dead.

I, E. E. W., wife of J. H. W., of ——, lithographic printer, say:—I am mother of deceased B. I. W., nine months old. She was a beautiful baby till she was vaccinated at about five months old. A week after she had convulsions and I ran with her to the doctor. Then she had diarrhœa, then she rallied round, but she has never been well since. The doctor has attended her all the time during the last four months, and I have fed her, according to his directions, on Ridge's food, baked flour, a little lime water in her milk, and pale brandy, also medicine. I have three other children all of whom have been vaccinated, and are doing well. Two are dead, one at 11 weeks, one at five months; one died of consumption, the other of bronchitis. There was no inquest in either case. This child was not insured. She died at 5.30 a.m. on Tuesday, 30th ultimo.

E. E. W.

I, E. J., of ——, widow, say:—I am next-door neighbour to the W's., and have seen deceased. It seemed a nice healthy baby at first. I have seen it frequently during the last three or four months, with the mother walking about with it. I believe it has been well nursed and well seen to, kept very clean and nice. I have seen it eating a crust while in its mother's arms in the street, and have heard her say it was fond of a crust. I think it has received every possible attention; from what I have seen I feel confident of it. I have no occasion to think it has been left or neglected in any way, but rather that it has been well cared for.

E. J.

I, A. B. G., of ——, M.R.C.S., L.R.C.P., say:—I have attended deceased for some months; it was brought to me to be vaccinated. It appeared in fairly good health, sufficient to justify vaccination. I vaccinated it in the usual manner, but limited it to one pock. I used calf

lymph. The vaccination took, and about a week or ten days after the mother came and said the child had a convulsion. Next day it started with diarrhœa, and this has persisted more or less ever since, and the child has wasted away. Children suffering from marasmus will pull up after vaccination. This case is unusual, though I have met with convulsions after vaccination. I have attended deceased throughout, and the mother has strictly attended to my orders. The child has died from marasmus ensuing upon vaccination, and without any blame whatever against the parents for neglect of any kind.

A. B. G.

Verdict.

That on the Thirtieth day of August in the year of our Lord One Thousand Eight Hundred and Ninety-two, in ——, the said B. I. W. died from marasmus ensuing upon vaccination.

Case 187, reported to the Commission by Mr. J. H. Lynn.

Case of J. J. M.: report to the Commission of Dr. Theodore Dyke Acland.

Vaccination. J. J. M., of ——, was vaccinated in four places, when five months old, by Dr. E. R., Public Vaccinator, on the 27th April 1885.

Alleged injury. Multiple abscesses; disease of various joints.

Source of lymph. Direct from the arm of G. P. R., of ——

Vaccinifer. G. P. R., died on the 4th May 1888, three years after vaccination; the certified cause of his death being "cerebral "disease; cerebro-spinal meningitis; convulsions, seven "hours." His vaccination is said by his mother to have been normal, and without complication, and his health up to within six weeks of his death to have been excellent. He was the second child of a family of six. His father is alive and is strong and well. His mother looks and says she is in good health. No relative on either father's or mother's side, as far as I was able to ascertain, had died of consumption, although the mother has lost one brother through pleurisy. Of the six children, three besides G. P. R. are now (April 1893) dead. S., aged two years, died on the 7th June 1885 of "tabes mesenterica and convulsions." N., aged five months, died on the 17th February 1891 of "suffocation whilst asleep in bed with mother." L., aged six months, died on the 17th September 1892 of "whooping-cough and bronchitis." (The certified cause is given in each case.) The two surviving children are well, and seem to be in good health. I was unable to detect in either of them any signs of tubercular or syphilitic inheritance. Neither of them had or had had any skin eruption. In one the lower teeth are irregular, but have none of the characteristics found in inherited syphilis.

Co-vaccinees. Three; Nos. 44, 45, and 47 in the register.

(i.) L. W. This child died when a year old of "tabes "mesenterica," according to the certificate. Mrs. C., her elder sister, who nursed her, states that vaccination was without complication of any kind, and that the child was in good health for many months before the commencement of her fatal illness.

(ii.) G. N. or N—r. A well-nourished, healthy, sturdy-looking boy. Vaccination is said by his mother to have been without complication of any kind. He has now (16th April 1893), four healthy scars.

(iii.) H. B. R. or R—s. A healthy child, in whom, according to the mother, vaccination was without complication. She has had no rash nor glandular enlargement at any time. Mrs. R., the mother of this child, lived for six or eight months after the vaccination next door to J. J. M., the subject of this report.

Sub-vaccinees. None.

Course of vaccination and illness. According to Mrs. M., the mother of the child, J. M., the arm began to inflame during the first week after vaccination, and it is stated in Mr. Lynn's letter to the Commission, bringing the case to their notice, that "the "arm was so bad when inspected that no children were "vaccinated from it." There is no corroborative evidence of this in Dr. E. R.'s register, which shows only that four vesicles had formed, and that the vaccination was successful. Mrs. M., the mother, did not at any time think the arm was bad enough to show to a doctor, and, as far as I can ascertain from her contradictory statements, she did not obtain medical advice for the vaccinal ulceration which is said to have occurred. Mrs M. states that the arm was treated by her from the fourth day with cream which she skimmed from the milk at home. The child was, however, only nursed by the mother at night, having been from the time it was a fortnight old nursed during the day by a Mrs. A. and her daughter, Mrs. P. By them the arm was treated with poultices, and washed with milk and water, as, they said, "it smelt so bad." Under this treatment the vesicles continued to ulcerate; subsequently some white ointment was applied from which time the arm began to heal. How long the arm was in healing there is no evidence to show; Mrs. A. says it was a "long time," Mrs. M. says it was about two months from the time of vaccination. Mrs. M. further informs me that no swelling or abscess formed in the axilla, and that there was no breaking out upon the body. It is stated in Mr. Lynn's letter informing the Commission of this case that "when "the marks began to dry a swelling came on the left of "neck, which broke on being poulticed, leaving a large scar." There are now (14th April 1893) two small scars on the side of the neck, which are just perceptible.

On the first occasion that I saw Mrs. A. she stated that there was no abscess, and no enlargement of the glands of the neck for four or five months after vaccination: of this she assured me she was *certain*. When I saw her on the following day, after she had talked the circumstances over with General P—s and her daughter Mrs. P., she contradicted the above statement, and both she and Mrs. P. then said that a lump began to form in the neck before the vaccination wounds were healed, which broke after being poulticed and discharged. Mrs. M., the mother, states that the abscess began to form during the first week, and that it was treated by Mr. B.

About four months after vaccination, according to the mother, *i.e.*, two months after the arm was well, the child had some eruption upon the head, which she calls a "ring worm," apparently meaning a sore of some kind. Mrs. A. and Mrs. P. say that this sore began to form before the arm was healed, but the mother says that both the arm and the abscess in the neck were healed before the head became sore; all three are, however, in agreement in stating that a sore did form upon the head.

The mother states that the child was treated for this sore by Mr. B., of ——. Mr. B.'s books for 1885 and 1886 show various entries under the heading "M," and in compliance with a request from myself, Mr. B. visited Mrs. M., and subsequently (6th May 1893) wrote as follows:—"I called in —— on M. to-day, in company "with Dr. E. R. and my son, and though the child was "in the house, we were not allowed to go upstairs to see "him. I have looked up the references in my day-book; "there are only four" (? five—T. D. A.) "which refer to "this case; the first three occur in May and June 1885, "and the fourth in the following December. In May it "appears to have been suffering with diarrhœa, and in "December with bronchitis, so I do not see how it can be "said to have been suffering from the vaccination." In a subsequent letter in reply to further inquiries, Mr. B. states that the following entries in his day-book refer to the infant M.:—

Page.	Date.	——
	1885.	
13	1st June - -	Medicine for diarrhœa.
17	5th „ - -	„ „ „
24	24th „ - -	„ „ „
150	18th November -	„ „ bronchitis.
	1886.	
366	28th December -	„ „ pneumonia.

The various statements are so contradictory that there is no certainty as to the sequence or chronology of any of the events. The only certain facts appear to be that the child was vaccinated, that the vesicles were treated with cream, poultices, and ointment; that the condition of the arm was not at any time considered sufficiently serious to necessitate medical advice; that at some date subsequent

to vaccination, a sore formed on the child's head, and that an abscess formed on the left side of the neck; whether after or before the sore on the head, I have been unable to ascertain, but the evidence tends to show that the wound on the arm and the abscess in the neck were completely healed within three months of vaccination. Mrs. M.'s own statement is that the arm was well in two months, and the abscess in the neck in one month, after vaccination.

The next ailment from which it is certain that the child suffered was a swelling on the index finger of the left hand. The letter received by the Commission, before quoted, states that the abscess in the neck "*was followed* "*with swelling on the index finger of left hand.*" This statement is misleading, the fact being that an interval of over *two years* intervened between the day of the child's vaccination (27th April 1885) and the date on which it was first taken to Mr. B. M., at the —— Hospital (16th May 1887). The date at which the finger began to swell cannot be fixed with certainty. It seems probable that it had been noticed by the mother for some considerable time before the child was taken to the Hospital. Mrs. M., the mother, states that she was first advised to have the finger treated *after the child began to walk*. Mrs. A. and Mrs. P. state that they are certain that there was nothing wrong with the finger a year previous to the child being taken to the Hospital. They also agree in stating that they are practically certain that it was noticed six months before that date. If these statements are correct, there is an interval between the healing of the vaccination wounds and the first appearance of any bone disease of more than a year.

It has been impossible to get reliable evidence as to the state of the child's health during this time. Mrs. M., Mrs. A., and Mrs. P., and a Mrs. W. (who lived in the same Court, but had nothing to do with the caring of the child), say that it was ailing on and off during this period; but what the nature, the gravity, or the duration of these ailments were, I have been unable to ascertain. On the other hand, Mrs. R., who lived next door to the M.'s for many months after the vaccination, and whose child was vaccinated from the same source as the infant J. J. M., states that she heard no complaint of any kind about the child's vaccination. She further says that she was naturally interested in it, seeing that her own girl was vaccinated at the same time and from the same source. M. A. S., who also lived in the same Court as the M.s, and knew them well, said to me (in General P—s's presence) that she believed that when the child J. J. M. began to walk it was healthy, and that though he may have had little breakings out, he was otherwise well. It may be noted that this person is stated, on a previous occasion, to have informed General P—s that the child was well before vaccination, and never since.

Further, Mrs. M—n and Mrs. B., who both lived in the same Court, and knew the child well, say they believe the child was well, and a fine child up to about two years of age. Mrs. B. first went into the Court when J. J. M. was 18 months old, and to the best of her recollection he was well then. Mrs. M—n was employed by Mrs. M., the mother of the child J. J. M., to take the child both to the —— and to the General Hospital. She says that she is certain that the child was well for a year before the finger became swollen, and that there was no talk in the yard about its being ill, or that it was injured by vaccination. She says that she took the child over and over again to the Hospitals, and that when she first took him, there was no suggestion made to her by the mother that the child's condition was due to vaccination, and that she made no statement to Mr. B. M. on the subject. She further states that the first time she heard the child's illness attributed to vaccination was when he was about five years old. Both she and Mrs. B. recognised a photograph of J. J. M. when two years old, shown to them by General P—s in my presence, and say that he was a beautiful child then. J. M—n, son of the above, also states that he remembers J. J. M. running about the yard apparently well.

The subsequent history of the child is a constant record of what is commonly recognised as strumous disease of joints and glands, and of chronic abscesses.

(1887.) On the 16th May 1887, two years and one month after vaccination, he was taken to the —— Hospital and was treated by Mr. B. M. as an out-patient for "dactylitis," *i.e.*, strumous disease of the finger. Mr. B. M. considered that the affection was constitutional. At first he was not certain whether the disease was syphilitic or tubercular, latterly he came decidedly to the opinion that it was tubercular. No complaint was made to him about vaccination at the time, and he found no evidence that the vaccination wounds were the original seat of the disease. The child had no open sore and no enlarged glands. He did not, and he does not, believe that there is any ground for believing that vaccination had anything to do with the disease of the finger. Mrs. M—n states that Mr. B. M. wished to remove the finger, but that Mrs. M., the mother, would not allow it.

(1889.) On the 7th March 1889 the child was admitted to the Children's Hospital in —— under the care of Dr. T. He was then suffering from "abscesses of the thigh due to "tubercular diathesis." Dr. T. informs me that he looked upon the case as one of strumous disease, that no complaint was made to him of vaccination, and that, in his opinion, it had nothing to do with it.

(1890.) On the 6th March 1890 the child was admitted to the General Hospital as an in-patient under the care of Mr. C. The entry in the Hospital books is that the child was suffering from tubercular disease of the liver. This, I expect, is a clerical error for tubercular disease of the knee. The child was removed from the Hospital by Mrs. M., the mother, because (Mrs. M—n states) she would not allow any operation to be done for it. Mr. C. states that no suggestion was made while the child was in the Hospital under his care at to vaccination being the possible origin of his illness.

(1893.) On the 28th February 1893 J. J. M. was admitted to the Homœopathic Hospital under the care of Mr. T., suffering from lumbar abscess, ankylosed elbow and knee, inflammation of the ankle joint, and suppurating glands in the neck. The lumbar abscess was opened and drained by Dr. G., Resident Medical Officer, who informs me that from what he knew of the case he was of opinion that the child's condition was not due to vaccination or its results.

The opinion formed about the case in each of the Hospitals has been that it is one of general strumous disease, that the child is not syphilitic, and that there are no grounds for supposing that his condition is due to vaccination.

The only other treatment, as far as I could ascertain, which the child has received was at the hands of S. N., of ——, who practises as an "herbalist" with simple and homely remedies. She seemed to be a shrewd, capable woman. She remembered the case well, the circumstances under which the child was brought to her and by whom he was brought. She states that when she saw the child (about three years ago, she thinks) he was "covered with "abscesses," and that she told those who brought him that she did not think it would get well, and advised that it should be taken to a Hospital. She is clear that no statement was made to her as to the possibility of vaccination having been the cause of the child's illness, and she is equally clear that she would have remembered it if such a statement had been made.

Present condition (April 1893). The child's present condition is typically strumous. There is, or has been, necrosis of the left index finger, and three metacarpal bones; there are three sinuses round the right elbow, which is ankylosed; there is necrosis of the second and third ribs on the right side; scars as of old sinuses over the left femur; ankylosis and contraction of the left knee; probable necrosis of left os calcis; swelling and inflammation of left ankle joint; and also swelling on the right side of the face, probably due to necrosis of the jaw. I was unable to detect any evidence of tubercular disease in thorax or abdomen. The liver and spleen can just be felt, but they are not notably enlarged, and there is no ascites. The teeth are irregular, but not characteristic of syphilis. There are four large cicatrices on the left arm at the seat of vaccination. They are smooth in the centre, foveated at the margin, not markedly irregular. There is no induration or pigmentation round them, they have the appearance of scars left after a considerable amount of inflammation. There is no perceptible enlargement of axillary or cervical lymphatic glands. There are two minute scars on the neck at the place where the abscess burst, and there is one spot of impetigo about the size of a threepenny piece on the right occipital region. The child's general nutrition is poor, and his whole appearance is that of chronic ill-health.

Method of vaccination. Dr. E. R. is a vaccinator of exceptionally large experience. He is enthusiastic in his work, and leaves no means untried for securing successful results.

Family history. The mother seems healthy; the only affection from which she suffers does not appear to have any bearing

upon the child's present condition. Her family history is bad. One brother has died of drink, and one sister of the effects of specific disease.

The father seems to be in fair health, but he has been for many years chronically out of work. He was drunk on both occasions on which I saw him, and was also drunk on another occasion when Dr. E. R. visited him.

J. J. M. is the fourth of six children, four of whom are living. The eldest, a girl of 15, is not robust looking; the second, B. P., died aged nine months, the certified cause of death being "pneumonia; convulsions." The third, a girl aged 12, seems in good health. The fifth, a girl, is the healthiest looking of the family. The last child, T., died aged one month, the certified cause of death being "pneumonia, one week; convulsions."

General surroundings. Poor and dirty. The house is down a Court, in the centre of which are two privies and urinals, separated by a large open dust-bin. At the date of my visit, the 17th April, the pan of one of the privies was full up to the seat, the drain being choked and the stench very great. The persons who inhabit the two houses immediately opposite, and only a few feet from this collection of insanitary receptacles, tell me that during the summer the houses are almost uninhabitable owing to the condition of the privies and a dust-heap. These privies are a few yards from the M.'s house, but in the immediate vicinity of Mrs. A.'s, where J. J. M. was brought up.

Conclusion. The child J. J. M. is suffering from strumous disease of the joints and soft tissues. Clinically the condition is one of chronic tubercular disease, and not one of chronic septicæmia or septic infection.

Supposing the disease of septic origin, the evidence is not sufficient to show that it was the result of vaccination or its sequelæ, since:—

(*a.*) There was no general infection at the time of vaccination. The ulceration of the arm may have been largely due to the method of treatment adopted, and attention must be drawn to the fact that the lymphatic glands in immediate relation to the part of the arm wounded in vaccination, viz., those in the axilla, did not, as far as I could ascertain, either enlarge or suppurate. It may further be noted that the glands of the neck frequently suppurate in consequence of some irritation on the head, and it is possible that the cervical abscess was secondary to the sore on the head.

(*b.*) A period of thirteen months, calculated on the best available evidence, elapsed between the healing of the suppurating gland and the first appearance of disease in the bone of the finger. It would be contrary to experience to suppose that septic infection could lie dormant during so long a period without giving any evidence of its existence.

Assuming the disease to be tubercular, it has to be considered whether there is ground for believing that inoculation occurred at the seat of vaccination. There appears to be no ground for this belief, since:—

(*a.*) The vaccinifer was healthy at the time of his vaccination, and, as far as I have been able to ascertain, continued healthy until within six weeks of his death, three and a half years afterwards; his death is not known to have been due to tubercular disease. Moreover, there are weighty reasons against the probability of the inoculation of tubercule in any case of vaccination properly performed even were the vaccinifer tuberculous at the time of the taking of lymph from the arm.

(*b.*) At no time, as far as I have been able to ascertain, has there been any evidence of local tubercular disease, either at the points of inoculation or in the glands in anatomical relation to them.

Lastly, the question remains to be considered whether the abnormal course of the vaccination could so have depressed the child's vitality as to render it liable to a constitutional affection to which it was predisposed.

To prove or disprove such an hypothesis is beset with difficulty. It must be taken into account that the child's arm and neck were apparently well three months after vaccination, and that although it had slight ailments, nothing of any note occurred until after the lapse of at least thirteen months. During this time the child was living under disadvantageous sanitary conditions. He was also largely deprived of his mother's care, being out at nurse during the day; and although, to the credit of Mrs. A. and Mrs. P., it must be said that they seem to have done their best for the child, their treatment of the arm was neither judicious nor successful; and under such conditions the child did not thrive. It is probable that the necrosis of the finger, which appears to have been the actual starting point of the present mischief, was a local disease independent of the foregoing vaccination.

There is no evidence to establish any connexion between the necrosis of the finger and the vaccinal ulceration, the affection of the head, or the abscess in the neck; and there appears to be no justification for stating that the child's present condition is due either directly or indirectly to vaccination.

THEODORE DYKE ACLAND, M.D.

CASE 188, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of L. V.: report to the Commission of Dr. Theodore Dyke Acland.

Vaccination. L. V., of ——, was vaccinated by Mr. S. L. M., L.S.A., Public Vaccinator, on the 26th July 1892.

Death. 10th September 1892.

Certified cause. "Vaccination, six weeks; erysipelas, eleven days."

Certified by. Mr. W. S., M.R.C.S., of ——, late of ——.

Source of lymph. Direct from the arm of M. B.

Vaccinifer. M. B. is a typically healthy-looking child, in whom vaccination is stated to have pursued a normal course without complication. There are now (31st December 1892) four healthy cicatrices.

Co-vaccinees. Two; one a primary vaccination and the other a re-vaccination.

(i.) W. S., of ——. The mother and child were away so that I could not see them, but the grandmother, who had lived in the house all the time, said that vaccination had no complication of any kind, and that the arm had completely healed before the child left.

(ii.) E. C., of ——. A re-vaccination. Without complication of any kind; there are now four normal scars and the boy is well.

Sub-vaccinees. Two.

(i.) L. H. Vaccination pursued a normal course until the arm was rubbed and one of the scabs removed. Even after this there was very little inflammation and the wound speedily healed. There was no rash and no glandular enlargement. There are four scars, irregular in size, but otherwise normal. Mrs. H., the mother, volunteered the remark that she had her baby vaccinated from L. V., the subject of this report, because he was such a fine child.

(ii.) E. M., of ——. I was informed by the sister, who appeared to have been taking charge of the child, that vaccination had pursued a normal course without any complication and the child had been well for about three months. At the beginning of December it fell ill, and died of pneumonia on Thursday, the 29th December. The certified cause of death was "bronchitis; convulsions."

Course of vaccination and illness. Vaccination in the case of L. V. seems to have been normal up to the eighth day, which was the last occasion upon which Mr. S. L. M. saw the child. Mrs. V., the mother, informs me that the inflammation round the pocks did not completely subside, and that about 13 days after inspection (that is, about the 21st day after vaccination) the arm was inflamed from shoulder to elbow. Three of the pocks had entirely dried up by this time, though the scabs were still adherent. From the fourth there was a slight discharge, but the mother did not think anything was wrong as the child seemed in good health, except that she was irritable. Mrs. V. did not begin to suspect that the arm was doing otherwise than well until the end of the third or the beginning of the fourth week. About this time the inflammation increased considerably, and the glands in the axilla became inflamed but did not break down. The inflammation spread to the neck and to the thorax, and the child became really ill with diarrhœa and sickness. Mrs. V. treated the child for nearly a week before she sought medical advice. She then took her to Mr. W. S. Notwithstanding treatment the child did not rally, and died in consequence of the cellulitis which

spread from the vaccination wound. Mr. W. S. states in a letter to me, dated the 23rd December, that "vaccination "had left a large sloughing wound in the arm." The mother, however, says positively that this is not the fact, that there never was an open wound at any time on the arm, and that the scabs which originally formed were on the child's arm when she died.

Treatment of vesicles. The vesicles were opened on the eighth day, and the arm was dried by Mr. S. L. M. with absorbent wool. He did not attend the child afterwards. Mrs. V., the mother, states that no shield was used and that no application was made to the arm except under medical advice; it was however, dressed with castor oil and cream, dusted with flour, and the discharge washed away from the wounds. As far as the mother knows, the pocks were not rubbed, and she did not allow any of the children to nurse the baby.

Method of vaccination. With an ordinary lancet, which, when I saw it, was clean and bright. Mr. S. L. M. assures me that he is very careful about cleansing it, and always wipes it between each vaccination in absorbent wool impregnated with perchloride of mercury. He was attending no septic case at the time of his vaccinations.

Previous history. Good.

Family history. Both father and mother state that until they came to ——, about 10 months, ago "they never knew what a day's "illness was." In March or April three of the children had measles, but there has been no illness in the house since. Two weeks after the death of the child L. V., towards the end of September, Mrs. V. suffered severely from mammary abscesses, which confined her to her bed for six weeks. She is, however, certain that they did not commence until a fortnight after the child L. V.'s death, and they appear to have been due to the sudden cessation of suckling owing to her child's death. All her confinements have been natural and she has had no miscarriages. The three surviving children are healthy.

General surroundings. Fairly good. Children well cared for and clean.

Sanitary conditions. Nothing of importance noted. It is not known that either the parents or children had been in contact with infectious disease. The father, who is a farm labourer, had not been carting dung or any offensive refuse.

Conclusion. The child L. V. died of diffuse cellulitis spreading from one of the vaccination wounds. From the length of time which elapsed between vaccination and the first appearance of the diffuse inflammation (from 21 to 28 days) it would *primâ facie* seem improbable that the cellulitis was directly due to the lymph used, or to the method of vaccination. It is probable that suppuration took place beneath one of the scabs owing to the treatment adopted by the mother (viz., the application to the vesicles, during the hottest part of the summer, of a decomposable fluid like cream, and the clogging of the wound by dusting it with flour), and that the septic infection was due to absorption of pus from the granulating surface of the wound, and not to any virus directly inoculated into the wound at the time of vaccination or inspection.

THEODORE DYKE ACLAND, M.D.

CASE 189 [SERIES], REPORTED TO THE COMMISSION BY Mr. J. H. LYNN.

Case of A. T. and P. T. E.: report to the Commission of Dr. Arthur Pearson Luff.

At the request of the Commission I have made an investigation into the circumstances attending the death of A. T., of——, and the illness of P. T. E., of——, both occurring shortly after their vaccination, on the 24th August 1892, at the——Lying-in Hospital.

Firstly, as to A. T. To state first the facts relating to A. T. The entry in the register of the death of the child was to the effect that A. T., aged twenty-five days, died on the 18th September 1892, the cause of death being certified by Dr. J. R. P., of——, as "vaccination, 14 days; cellulitis, 8 days."

On interviewing Dr. J. R. P. he informed me that the child had been vaccinated at the —— Lying-in Hospital, where she was born, and that when she was brought to him several (probably from fourteen to seventeen) days after vaccination, she was a delicate child, and had upon the left arm four large vaccination marks, the arm being in an œdematous condition. To his knowledge there was no erysipelas in the vicinity at the time.

On making inquiries at ——, where the mother of the child A. T. had lived, I found that since the death of the child she had gone away into the country and had left no address; and subsequently it was found impossible to trace her. She was a single woman and the deceased was her first child.

On inquiry at the —— Lying-in Hospital, the Resident Medical Officer stated that the mother of A. T. had been delivered there on the 24th August 1892, and that the child, with the child P. T. E. and others, was vaccinated on the same day by Dr. G from a child named G. T., sent from the —— vaccination station as a healthy child and one well fitted to vaccinate from. *Vaccinifer (of both children).*

Nine children in all were vaccinated from this vaccinifer, and the following is a list of them, together with the comments on the case, taken from Dr. G.'s private ledger:— *Co-vaccinees (of both children).*

Name of Child.	Address.	Age and State of Mother.	Age when Vaccinated.	No. of Vesicles.	No. of successful Vesicles.	Inspection.	Result.
A. T.	—	19, single	1 day	4	4	8th day	Successful
H.	—	23, married	4 days	4	3	8th „	„
F.	—	35, single	3 „	4	3	6th „	„
P.	—	27, married	2 „	4	4	8th „	„
D.	—	24, married	2 „	4	4	8th „	„
S.	—	20, married	2 „	4	4	8th „	„
H—s.	—	30, single	3 „	4	4	8th „	„
D—n.	—	25, single	2 „	4	4	8th „	„
P. T. E.	—	27, married	4 „	4	4	6th „	„

Of these children, after a great deal of trouble, owing to the parents having frequently moved, the following six have been seen, namely, H., F., P., D., S., and P. T. E. In all these six, with the exception of P. T. E. (see below), the vaccinations appeared to have run perfectly normal courses, the arms looking well and the mothers stating that there had been no trouble from vaccination. On calling at the addresses of the parents of H—s and D—n. I ascertained that they had left, and found after inquiries that it was impossible to trace them.

Secondly as to P. T. E. With reference to the child P. T. E., Mr. Lynn's letter of the 20th September 1892, informing the Commission of the case, stated that "P. T. E. was born at —— Lying-"in Hospital on the 21st August 1892, and on the fourth "or fifth day was vaccinated, as was believed, with calf "lymph. Before leaving this institution (on the eleventh "day from birth) the arm was inspected, and no remark "made regarding it. It was, however, swollen and "inflamed. These conditions grew worse; numerous "ulcerous places appeared round the four places and on "the face. The vaccination marks became apparently, or "actually, confluent, with the appearance of a deep, open "sore. A friend of the mother (who was full of trouble "and far from well) took the child to a chemist, at whose "suggestion she took it to a local doctor, who refused to "have anything to do with it, urging that it should go "to a hospital. When eighteen days old, therefore, it was "taken to the Temperance Hospital, Hampstead, and the "following day received as an in-patient. It is now an "out-patient. (Became an out-patient to-day, 20th Sep-"tember. Will be dressed by the House Surgeon again "to-morrow, and be seen by the doctor who has charge of "the case on Thursday.) The arm is better, but still "discharging badly, and the ulcerous spots still appear all "round the arm. At the hospital it was said to be a case "of blood poisoning. This is the second child. Was "born very healthy. The other child has been 'well "'always.' The mother is healthy, and the father was a "strong and healthy man. (He took his own life through "trouble connected with his employment three months "since.)"

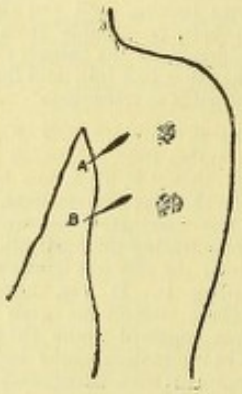
From inquiries made at —— Lying-in Hospital and from the mother, it appears that P. T. E. was born at the Lying-in Hospital on the 21st August 1892, and vaccinated on the fourth day after birth. The mother had gone into the Hospital for her confinement, having recently lost her

husband, and not being able to afford to stay at home. About five days after vaccination, the mother states that the child was fretful, and that a few spots appeared on his face, "a sort of little ulcer on each side of the face, and "one on the head"; but when she left the Hospital, the arm presented nothing unusual. Mr. B. saw it, and said it was all right. Two days after her return home, i.e., about ten days after vaccination (this date is only approximate, Mrs. E., the mother, not being quite certain of it), the vaccinated arm began to swell. The mother stated that she was particularly careful with the arm, and that it did not get rubbed at all. The places began to get sore, and she took the child to the Temperance Hospital, where it was admitted. (An elder child, now two years of age, had been vaccinated at three months, his arm giving no trouble.)

Dr. Wilde, Registrar at the London Temperance Hospital, kindly furnished the following report:—

> P. T. E., aged 19 days, was admitted to the Hospital on the 8th September 1892 under Dr. Collins. It was born on the 21st August 1892, and was vaccinated on the 25th August in four places. About the eighth day the arm commenced to swell and was very painful. On examination, the left arm was found to be swollen down to the elbow; near the shoulder were four large vaccine pustules which had sloughed and were surrounded by yellow excavation; around the pustules were groups of smaller vesicles containing semi-purulent fluid. Under boracic fomentations the child rapidly recovered. No fresh spots or pustules developed anywhere, and the sloughing sores on the arm cleared up and skinned over. The child was discharged on the 19th September 1892.

Upon making inquiries I found that the child had been sent to live with its grandmother, but on the 28th October 1892, Mrs. E., the mother, brought him to me for inspection. The child was a well-nourished, healthy-looking infant, with no signs of cutaneous eruption upon him, and had been suckled by its mother up to the 19th October. There were two smooth, rounded vaccination cicatrices in the usual site on the left arm of full size and, in addition, running transversely across the inner part of the arm, were two linear scars, (*a*) and (*b*) on the drawing below, which, like the vaccination marks, were reddish in tint and showed no signs of contraction.



One of these, about three-quarters of an inch long, and slightly wide at its upper end, was situated at the axillary fold; the other, about the same length, was only two inches lower down the arm. There seemed to have been very little loss of substance, and no other abnormal appearances could be detected.

General Summary.

The two children A. T. and P. T. E. both appear to have suffered from cellulitis, which resulted in death in the case of A. T. and in recovery in the case of P. T. E. They were both vaccinated at —— Lying-in Hospital from the same vaccinifer on the 24th August 1892, A. T. being then one day old and P. T. E. four days old. A. T. left the Hospital on the 6th September 1892 (13 days after vaccination) and P. T. E. left on the 31st August 1892 (seven days after vaccination). In the case of A. T. the cellulitis was first seen by a medical man somewhere about the fourteenth to the seventeenth day after vaccination, and in the case of P. T. E. on the fifteenth day after vaccination.

Of the seven other children vaccinated from the same vaccinifer, five have been traced and seen; the vaccination in each of these five children pursued a perfectly normal course and was attended with no complication. As these children were vaccinated from the same vaccinifer and at the same time as A. T. and P. T. E., it would appear probable that the cellulitis from which these two infants subsequently suffered was not due to inoculation with impure vaccine lymph, but was due to infection from some other source (doubtless through the vaccination wounds).

The next point to ascertain was whether these two children had been infected with septic matter from a common source while in the Lying-in Hospital, since after leaving the Hospital they were taken to different parts of London, and did not again come in contact with one another. As the result of careful inquiries I find:

(i.) That the mothers with their children were in separate wards at the Hospital. Mrs. E. and her child being in Ward 12 and T. and her child being in Ward 15. P. T. E. was born on the 21st and A. T. on the 24th August. The wards Nos. 12 and 15 are both on the first floor and are both under the same Sister during the day, and the same night nurse during the night, but different probationer nurses are attached to the two wards. The Sister and the night nurse were the only two members of the nursing staff who in common had to attend to both P. T. E. and A. T., and had to dress the vaccinated arms. Both the Sister and night nurse were during that period (August and September) in good health and were not suffering from any wounds on the fingers or other parts of the body.

(ii.) No other vaccinated children attended at the same time by the same Sister and night nurse suffered subsequently from septicæmia or cellulitis.

(iii.) Dr. G., Physician to the Hospital, vaccinated both the children (as well as the others previously referred to), and is satisfied that at the times of their leaving the Hospital the vaccination in each was pursuing a normal course.

(iv.) P. T. E. left the Hospital in good condition on the 31st August (seven days after vaccination), and was next seen by a medical man eight days later, when he was suffering from cellulitis of the arm (on the fifteenth day after vaccination).

(v.) A. T. left the Hospital in good condition on the 6th September (thirteen days after vaccination, and six days later than P. T. E.), and was next seen by a medical man somewhere between one and four days later (that is, between fourteen and seventeen days after vaccination), when she was suffering from cellulitis of the arm.

(vi.) Therefore, in the case of P. T. E. cellulitis was first diagnosed eight days after leaving the Hospital, and in the case of P. T. E. somewhere between one and four days after leaving.

Conclusion.

Taking all these circumstances into consideration, I am of opinion:

(i.) That the cellulitis from which P. T. E. and A. T. suffered was not due to inoculation with impure vaccine lymph.

(ii.) That the cellulitis was most probably not due to a common source of infection at the Lying-in Hospital, but was more probably due to separate infection at the houses of the parents from bad sanitary conditions or want of cleanliness in the treatment of the vaccination wounds.

ARTHUR PEARSON LUFF, M.D.

CASE 190, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of F. C. R.: report to the Commission of Dr. Arthur Pearson Luff.

At the request of the Commission I have made an inquiry into the circumstances attending the illness and death of F. C. R., of ——.

The entry in the register of the death of the child was to the effect that F. C. R., four months of age, died on the 15th September 1892, the cause of death being certified by Dr. J. B., of ——, as "erysipelas (vaccinated fourteen "days previously)."

Dr. J. B. informs me that the child was healthy when he vaccinated her on the 25th August 1892, and that she was doing well when he saw her on the eighth day after

vaccination. Fourteen days after vaccination the arm became red and Dr. J. B. attended the child for a week and prescribed for her.

There were no cases of erysipelas, or any other fever, in the vicinity at the time to Dr. J. B.'s knowledge.

...nifer. The deceased was vaccinated from a child named K., of ——; but the parents of this child have removed and I have been unable to trace them.

...ci- Four children, in addition to F. C. R., were vaccinated at the same time from the same source. The first, B., of ——, I have seen, and the child is in a perfectly healthy condition and did well after vaccination; the second, C. of ——, I have also seen, and is in a healthy condition and did well after vaccination; the third, P., of ——, and the fourth, P—d, of ——, have left the addresses given and cannot be traced.

The mother of the deceased child F. C. R. informed me that the child was healthy up to the time of vaccination, and that the week after vaccination the scabs came off. No one in the house, or attending the child, suffered from any bad wound. Two days after the scabs came off, *i.e.*, about nine days after vaccination, the arm began to swell, and the swelling extended to the elbow and across the chest. As the child seemed ill she took her to Dr. A., of ——, who refused to treat the child and referred the mother to Dr. J. B. The mother took the child to Dr. J. B., who gave her some lotion to apply to the arm, and some powders for the child to take. The child was sick only when she took the medicine, and did not suffer from diarrhœa or from convulsions.

...ary ...und- The sanitary condition of the mother's house was not good, the closet being a Hopper one and in a very filthy condition.

...lusion. From the small amount of information which I have been able to gather in connexion with this case, it seems that vaccination went on in a normal way until the scabs came off on the seventh day, and that on the ninth day erysipelas supervened and proved fatal on the twenty-first day after vaccination. Apparently the erysipelas was not due to the use of impure vaccine lymph.

ARTHUR PEARSON LUFF, M.D.

CASE 191, REPORTED TO THE COMMISSION BY THE CORONER.

Case of C. P.: report to the Commission of Dr. Arthur Pearson Luff.

On the 11th October 1892, at the request of the Commission, I proceeded to ——, and, on the 12th, attended the adjourned Coroner's inquest touching the death of C. P., aged five years, who died on the 8th October. A communication had been previously received by the Commission from the Coroner to the effect that the child's death had been attributed by the mother to vaccination, and that on that account the inquest had been adjourned to the 12th October. I append a summary of the evidence given and of the investigation I made at and after the inquest.

The evidence of M. P., the mother of the child, of ——, was to the effect that the deceased was vaccinated at the public vaccination station at —— on the 26th January 1888, and that he had been weak and ailing ever since he was vaccinated. His eyes became bad a few days after the vaccination, and she took him to the Eye Infirmary at ——, and shortly afterwards an abscess formed in the face. Shortly afterwards he was admitted for three or four weeks into the —— Infirmary and soon after quitting the Infirmary, he was for three months in the Children's Hospital at ——. Since then he had been well at times and ill at times, but in her opinion he was a strong, healthy child before vaccination. On the 5th October 1892, the deceased was seized with shivering and cold, and the next morning had diarrhœa. She went to fetch the doctor on that morning and on coming back the child was dead. His life was not insured. Out of the thirteen of her children she had lost six, some from teething, others from convulsions. The deceased was unable to take anything during the night preceding his death, and was purged several times during the night. In her opinion she did not consider vaccination had anything to do with the deaths of her other children. Her only reason for attributing the illness of the deceased to vaccination was that the affection of the eyes came on a few days after vaccination, and that the child had been weak and ailing since that time.

The evidence of Dr. E. B., of ——, was to the effect that he had attended the deceased some months before his death, but not recently. On the 6th October 1892 the mother brought an order for him to see the child, but on calling an hour later he found the child was dead. On external examination of the body he found it emaciated and several old scars on the neck, some barely healed, also several enlarged glands in the neck. He had made a post-mortem examination of the body on the 10th October. On opening the chest there were old adhesions to the chest wall. Both lungs were studded with tubercle. The heart and stomach were normal. There was evidence of peritonitis over the whole abdominal cavity. The liver and spleen were much enlarged, and throughout the whole of the small intestines there were tubercular ulcers. The remaining organs of the body were healthy. The cause of death was clearly tubercular disease. All the children of Mrs. P., the mother of the deceased child C. P., that he had attended were of a strumous nature. In answer to questions put by me he stated that there were no signs of interstitial keratitis nor was there any sign of syphilitic disease anywhere. The vaccination scars looked quite healthy and normal. *Post-mortem examination.*

From inquiries that I made at the hospitals in ——, where the child was treated, it would seem that he was suffering at those times from a simple inflammatory affection of the eyes and from debility.

I ascertained from the Vaccination Officer of the —— Union that the deceased was vaccinated at the public station in —— on the 26th January 1888 by Dr. J. C. W., the late Public Vaccinator. The lymph employed was taken from a child named S. A. R., and at the same time four children were vaccinated from the same source. *Source of lymph.*

I have made thorough inquiries concerning all these children. The vaccinifer S. A. R. is now alive and in good health, and has never suffered from any illness. Of the four other children vaccinated from the same source, I have traced three who are all now living and in good health and did not suffer in any way after the vaccination. The fourth one had removed from ——, and could not be traced. *Vaccinifer.* *Co-vaccinees.*

The verdict at the inquest was "death from general "tuberculosis." *Verdict of Coroner's jury.*

The cause of death was tubercular disease from general tuberculosis. It is clear that the death of the child was not in any way directly connected with vaccination, which had been performed between four and five years previous to death; and of the other children vaccinated from the same source, three out of the four who were traced and seen had not in any way suffered from vaccination. *Conclusion.*

ARTHUR PEARSON LUFF, M.D.

CASE 192, REPORTED TO THE COMMISSION BY THE CORONER.

Case of R. H. B.: report to the Commission of Dr. Arthur Pearson Luff.

On the 18th October 1892, at the request of the Commission, I attended a post-mortem examination of the body of R. H. B., aged four months, who died on the 16th October; and I subsequently on the same day attended the Coroner's inquest touching the child's death. A communication had previously been received by the Commission from the Coroner to the effect that the death of the child had been stated to be connected with vaccination.

The post-mortem examination was made by Dr. L. T. in my presence and in that of Dr. W. M. L., the Public Vaccinator of the district, who had vaccinated the child.

The evidence of E. B., the mother of the child, of ——, was to the effect that the deceased was born on the 4th June 1892, and was, when seven weeks old, vaccinated by Dr. W. M. L. at the vaccination station at ——, on the 28th July. He was vaccinated from another child. The scabs came off on the eighth day after vaccination, and on the same day a rash came out all over his body. She took him to Dr. W. M. L. (whose assistant stated that the rash

was due to vaccination, but on a later occasion Dr. W. M. L. informed her that the rash was simply thrush), who gave her some medicine and some lotion to apply to the skin. As she was not satisfied with the results of the treatment, she took him to the Children's Hospital at Shadwell on the 31st August, where some powders were prescribed, also a powder to dust upon the skin, and she was told to be very careful not to take the child's disease, and to bathe her breast after suckling the child each time

[*Note.*—From inquiries that I have made at Shadwell Hospital, it seems that the child was seen there by the House Physician, Mr. G. Norman, who diagnosed congenital syphilis, and who prescribed grey powder to be given internally and a dusting powder containing calomel to be applied to the skin. He remembers warning the mother not to let others suckle her child, but he states that he did not tell her that she incurred any risk of catching the disease from the child.]

She took deceased to Dr. L. T. on the 24th September, three weeks before the death of the child. He told her that it was a very serious case of blood poisoning from vaccination, and that she must be very careful not to take the disease, and to bathe her breast with tea. The rash did not disappear under the treatment of Dr. L. T., who saw the child subsequently three times prior to his death. The deceased's life was insured and the mother receives 1*l.* 10*s.* by his death. She insured it when it was about a month old, and her other child, now living, is also insured. She stated that her left breast had been bad since the 13th October, five days before. She only suckled the child with that breast, and the rash first appeared as spots all round the nipple, which disappeared after three or four days, fresh ones appearing near the left shoulder and in the left armpit. In answer to questions put by me the mother stated that the child did not suffer from snuffles. He was a "full term" child. He had no rash on his body before vaccination, and no eruption at any time which she noticed round the anus. The rash that came out upon the child after vaccination was red, and consisted of spots varying in size from a pin's head to a threepenny-piece. The spots at present near her left shoulder and in the left armpit are exactly similar to those that were around the nipple of the left breast. The spots itched and she frequently rubbed them. She has no similar spots on any other part of the body. She has had no miscarriage, and her other child has not had the snuffles or any skin eruption.

The evidence of A. S., the grandmother of the deceased, of ——, was to the effect that on the 13th October the deceased seemed very bad, vomited continually, and passed blood from the back passage. Dr. L. T., who saw the child, said in her presence that the rash was caused by vaccination.

The evidence of Dr. L. T., of ——, was to the effect that he first saw the deceased on the 24th September 1892. The child had an eruption on the head and behind the ears, and also a squamous eruption on the abdomen and the back. The mucous membrane of the nose was much swollen. The skin of the face was of a dirty greenish hue. The child was much emaciated, and round the anus and the organs of generation there was a "tubercular-like" eruption. He asked the mother if the child had been seen by anyone, and she stated that the child had been seen by Dr. L. and by Dr. W. M. L., and subsequently had been treated at the Shadwell Hospital, where she was advised to be careful not to acquire the disease from the child when suckling. In his opinion there was an undoubted appearance of syphilitic disease. He treated the child with perchloride of mercury, and it improved under the treatment. On the 13th October he again saw the child and deemed him to be dying. The child retained no food, and was passing blood and mucous per rectum. At the post-mortem examination he found the body very much emaciated. Externally there was an eczematous rash behind the ears and over the scalp, and also a squamous rash over the abdomen and back. The brains, lungs, heart, spleen, kidneys, and stomach were normal. The intestines were congested in parts, one part being considerably inflamed; many of the mesenteric glands were much enlarged. In his opinion the cause of death was exhaustion consequent on bad nutrition, but it was quite possible that the child died from syphilis. He told the mother that the rash was probably due to blood poisoning from vaccination. He did not definitely say that it was due to such a cause. He could not say for certain whether death was caused by vaccination until the liver had been examined. He considered that the syphilis might be hereditary. The mother had an eczematous rash upon her breast. He considered that a woman who had had syphilis could have such a rash, but not precisely as it occurred in her case.

The evidence of Dr. W. M. L., of ——, the Public Vaccinator for the district, was to the effect that deceased was vaccinated by him on the 21st July 1892. He vaccinated from another child, and at the same time vaccinated several others from the same vaccinifer. It was his custom to vaccinate from child to child, and not with direct lymph. He had never known of an authentic case of transmission of disease (except vaccinia) from child to child after vaccination. He saw the deceased ten days later, on the 31st July. The child had an ordinary inflammatory rash on the vaccinated arm, on the front of the neck, on the inside of both thighs and round the genitals. It was not in his opinion a syphilitic rash, but such as he saw every day on some children after vaccination. He had had six months' experience of syphilitic cases in the Lock Wards of the Edinburgh Infirmary, and from his experience he was sure that the rash upon the deceased was not syphilitic in its nature. He saw no trace of tubercles round the anus either on the 31st July or at the post-mortem examination. On the 5th August he again saw the child. The rash was then confined to the face and genital regions. The vaccination spots were not then inflamed, nor was there any induration to speak of. He informed the mother that the vaccination might possibly have caused the rash as a result of general irritation, such as might have been caused by any scratch. He had been present at the post-mortem examination, and, in his opinion, the cause of death was mal-nutrition and mal-assimilation. There was no evidence of syphilis, and he did not think that vaccination had anything to do with the cause of death.

In view of the discrepancy in the medical evidence as to whether the deceased had suffered from vaccino-syphilis, I was myself requested by the Coroner to examine thoroughly the viscera of the child in order, if possible, to settle the disputed question, and the inquest was adjourned on that account for a fortnight. I received on the same day (18th October 1892) at St. Mary's Hospital from the Coroner's officer some sealed jars containing the viscera and parts of the skin removed from the abdomen and back of the deceased, and on the 1st November I attended the adjourned inquest and gave evidence to the following effect:—

I was present at the post-mortem examination of Dr. L. T. and Dr. W. M. L.; I carefully examined the body of the deceased both externally and internally. There was no induration round any of the vaccination marks. The glands in the axilla of the vaccinated arm were not enlarged nor hardened. There were a few patches of eczema upon the scalp and at the junction of the scalp and ears. There was also some eczema in both groins. Upon the skin of the abdomen and back there were a few scaly patches resembling in appearance psoriasis. There was no other rash upon the child, and there was no evidence whatever around the arms of the presence or past presence of mucous tubercles. Internally, the only abnormal appearances that I noticed were that the liver was considerably enlarged and pale in colour; the intestines, and especially the large intestine, were in an inflamed condition; and the mesenteric glands were swollen and congested. I have submitted the liver, mesenteric glands, intestines, kidneys, and the portions of skin from the abdomen and back with the scaly patches on them to a careful examination, microscopic and otherwise, at my laboratory at St. Mary's Hospital. The enlargement of the liver was generally of a fatty nature, together with some infiltration of an inflammatory character. The intestines, and especially the large intestine, showed signs of inflammation throughout. The mesenteric glands were in an inflamed condition. The kidneys showed cloudiness and signs of inflammation. The few scaly spots from the skin of the abdomen and back showed the ordinary appearance of psoriasis. I am convinced that there is no evidence that the child ever had syphilis communicated to it by vaccination, and that the evidence all points to the child's never having suffered from vaccino-syphilis. The cause of death, in my opinion, was mal-nutrition consequent upon the diarrhœa and loss of blood from the bowels, caused by inflammation of the bowels, of which inflammation there is undoubted evidence. The enlargement of the mesenteric glands is such as would be expected to be found in connexion with inflammation of the bowels. The vaccination spots were perfectly healed The eczematous rash upon the child was not a syphilitic rash. I am also of opinion, after examining the mother's breast, that the rash upon it is not syphilitic, and there is no evidence of the mother having suffered from syphilis. There is scarcely any evidence of hereditary syphilis in the child.

ce of h. The deceased was vaccinated from a child named C., nine other children being vaccinated at the same time from the same vaccinifer.

ecci- I have seen and examined all those nine children, and on all of them I find the vaccination scars perfectly healthy, and, with one exception, no rash upon any of the children. The rash upon this one child was simply that of ordinary eczema.

inifer. I have also seen and examined the vaccinifer C., the vaccination marks upon whom are perfectly healthy, and the child is also in a healthy condition.

ict of ner's "The death of the deceased was due to mal-nutrition "consequent on diarrhœa and loss of blood from the "bowels, caused by inflammation of the bowels."

lusion. In my opinion the inflammation of the bowels which caused the death was due to some irritant substance. The death of the child was not, in my opinion, directly connected with vaccination.

ARTHUR PEARSON LUFF, M.D.

CASE 193, REPORTED TO THE COMMISSION BY MR. J. H. LYNN.

Case of T. A. H.: report to the Commission of Dr. Sidney Coupland.

The infant T. A. H. was brought by his mother to the London Temperance Hospital on the 20th October 1892, suffering from an irritable rash ("prurigo") over the upper arms, especially the left; and the back of the neck. Mrs. H. stated that this rash first appeared about three weeks after the child had been vaccinated, starting from the vicinity of the vaccination sites. The child's general health was unaffected.

T. A. H. was born on the 7th May 1892. He was breast-fed, and, except for "some breaking out behind the ear" when a month old, had been perfectly healthy. On the 31st August 1892 he was taken by his mother to the vaccination station, ——, and was vaccinated (five insertions) by the Public Vaccinator, Mr. C. Four of these insertions "took." Mrs. H. was unable to take the child for inspection until the 15th day, when Mr. C. said that the arm was going on all right. About a week later the rash commenced, for the treatment of which it was subsequently taken to the London Temperance Hospital. I may add that when I visited the child (5th November 1892) the rash had disappeared; the skin of the arm appeared to be unduly harsh, dry, and reddish. There were four recent vaccination cicatrices on the arm.

Through the courtesy of Mr. C. I have since been enabled to visit the vaccinifer to this case and the sole co-vaccinee.

cinifer. A. G. W., of ——, was born on the 20th May 1892, and vaccinated on the 24th August 1892 at the vaccination station, ——. The vaccination (five insertions) was perfectly regular, and on the 31st August lymph was taken from the arm to vaccinate T. A. H. and A. G. (see below). The infant A. G. W.'s arm did perfectly well. He had enjoyed good health (breast-fed) throughout, and neither before nor since vaccination has he suffered from any cutaneous eruption. He is the fourth child of his parents, the others being all well and going through their vaccinations naturally.

accinee. A. G., of ——, was born in May 1892 and vaccinated on the 31st August 1892, from the same vaccinifer (A. G. W.) as the child T. A. H. His mother states that there was some redness and swelling of the arm after vaccination, but neither then nor subsequently has the child had any rash on the skin. He is a blonde, healthy-looking child, one of three in family, all of whom are healthy.

To return to the case of T. A. H. His father is a police-sergeant, aged 31, who has suffered from "inflam- "mation of the lungs." His mother, aged 26, enjoys good health. She had at the time of my visit two small patches of psoriasis on the forearm. The family were then living temporarily in —— as caretakers; but when the child was vaccinated they were occupying apartments in ——. The first-mentioned house in —— seemed to me to be in a sanitary state. There are two other children in the family, neither of whom have any skin affection. The elder, E. I., aged four, is a healthy boy, who, apart from one or two "fits" when teething, has always been well. The other, C. W., aged two and a half, is rickety (there is enlargement of the wrists and beading of ribs), but has good health now. This child was brought up by hand. Both the children were vaccinated in infancy and their vaccination gave no trouble.

Conclusion. It appears to me that the case of T. A. H. is of the class of "prurigo following vaccination," to which Mr. Hutchinson has drawn attention (*Archives of Surgery, vol. I., page* 161), and that it is a mild example of that class. There is no evidence that the slight skin affection was transmitted from the vaccinifer; and, having had the opportunity of seeing Mr. C.'s practice, I can vouch for the care and circumspection with which he selects vaccinifers and performs the operation.

SIDNEY COUPLAND, M.D.

CASE 194, REPORTED TO THE COMMISSION BY THE CORONER.

Case of G. B. C.: report to the Commission of Dr. Arthur Pearson Luff.

On the 28th October 1892, at the request of the Commission, I proceeded to ——, and on the same day attended the Coroner's inquest touching the death of G. B. C., aged five and a half months, who died on the 26th October. A communication had previously been received by the Commission from the Coroner to the effect that an inquest would be opened on the 28th October at —— on a child whose death occurred shortly after vaccination. I attended the inquest and thoroughly investigated the circumstances of the death.

The evidence of M. C., the mother of the child, of ——, was to the effect that the deceased was born on the 12th May 1892. He never had had anything the matter with him until he was vaccinated, with the exception of an attack of measles at the beginning of July. She always thought him a strong child. The child was vaccinated on the 11th October. The vaccination did not take, and he was re-vaccinated on the 18th October. On the 22nd October the vaccination spots appeared to the mother to be going on all right, but the child had a slight cold. The child was left with the grandmother. The mother saw him again on the 24th and 25th October, when the child seemed no worse. The arm presented no appearance out of the common. On the 26th October she heard that the child was dead. She was in the habit lately of leaving the child in the charge of the grandmother, sometimes for days at a time, while she was away at work in ——. The child was fed partly at the breast and partly on cow's milk, corn-flour, potatoes, and gravy. So far as she knew he had never suffered from convulsions.

The evidence of L. C., the grandmother of the child, of ——, was to the effect that the child thrived till he had the measles in July, after which he lost flesh. The vaccination was done by Dr. P. of ——. The only difference in the vaccinated arm in her opinion was that it was not so much inflamed as the arms of most vaccinated children she had seen. On the 25th October there was no inflammation round the vaccination spots, nor were the spots so large as she had seen on her own children at the same period of vaccination. On the same day the child was wheezy on the chest and seemed to have caught cold. Later in the day he had great difficulty in breathing; she poulticed the chest, but the breathing gradually became worse till the morning of the 26th October, when the child died. The child had never suffered from convulsions, vomiting, or diarrhœa.

The evidence of Dr. P., Public Vaccinator, of ——, was to the effect that the deceased was brought to the vaccination station on the 11th October. He vaccinated with fresh vaccine taken half an hour previously from a child named S., and at the same time he vaccinated, from the same child S., three other children. The child S. was vaccinated with ordinary vaccine lymph obtained from London. The three other children vaccinated from the vaccinifer S. had been seen by him, and they were all perfectly well and the vaccination spots normal.

The evidence of Dr. A. C. C., of ——, was to the effect that he had that day made a post-mortem examination in conjunction with Dr. B. S. He found four vesicles on the left arm, well developed, in a typical and normal condition

for the period of vaccination. There was no inflammation round the vaccination marks, no induration, and no suppuration. The glands in the left axilla were not enlarged. There was no rash upon the body, with the exception of a little common eczema between the buttocks. The base of the right lung was considerably inflamed, and there was also congestion of the lower lobe of the left lung. In his opinion the cause of death was inflammation of the lungs, caught from a cold during the recent sudden change in the weather, and the death was not in any way connected with vaccination. There was not any indication of septicæmia nor was there any indication that the inflammation of the lungs was septic in its origin.

The evidence of Dr. B. S. was confirmatory of that of Dr. A. C. C. He was satisfied that the deceased died of inflammation of the lungs, and that the death of the child was not in any way connected with vaccination.

Verdict of Coroner's jury. The verdict was "death from natural causes, viz.:—"inflammation of the lungs."

Conclusion. It is evident that the cause of death in this case was not in any way connected with vaccination, which had been carefully performed and was pursuing its normal course when the child was taken ill with inflammation of the lungs, from which disease he died.

ARTHUR PEARSON LUFF, M.D.

CASE 195, REPORTED TO THE COMMISSION BY THE CORONER.

Case E. M. C.: report to the Commission of Dr. Theodore Dyke Acland.

Vaccination. E. M C., aged five months, of ——, was vaccinated by Dr. E. L. W., Public Vaccinator, at ——, on the 25th October 1892.

Death. 28th October 1892.

Inquest. 31st October and 1st November 1892.

Verdict of Coroner's jury. That the child died of debility; a rider being added to the effect that Dr. E. L. W. did not exercise sufficient care in examining the child before vaccination.

[*Note.*—Inasmuch as death was alleged to have resulted from vaccination this report has been made in the same manner as my preceding reports, viz., all the circumstances of the vaccination have been considered, and inquiry has been made as to the effect of vaccination on the other children who were inoculated with the same lymph, but it should be stated that the previous history of the case, the course of the vaccination, and the post-mortem examination show that death resulted from causes unconnected with the process of vaccination.]

Source of lymph. Direct from the arm of F. C., of —— (No. 306 in the register).

Vaccinifer. F. C. (No. 306) is a well-nourished, healthy-looking child, who is and has been well. Vaccination pursued a normal course. When I saw the child on the 4th November there were four normal scars; three of the scabs had come off, and there was no surrounding inflammation. The child appeared in all respects a fitting vaccinifer. Mrs. C., the mother, has been ill with mammary abscess; but this did not commence till some days after her child was vaccinated.

Co-vaccinees. Seven; Nos. 314 and 316–321 in the register. Six of these were primary vaccinations, and one, No. 321, was a re-vaccination. All presented themselves for examination on the eighth day (1st November) and were seen by Dr. E. L. W., who reports that they each had four normal vesicles with the exception of C. L., No. 317, who had only two. I saw all these cases on the 4th November (the eleventh day). The results were as follows:—

(i.) R. W. O., of —— (No. 314). Seen first by me on the 1st November, when there were four well-formed vesicles with one-quarter inch areola. On the 4th November there were four healing vesicles and the areola was almost faded. Course of vaccination normal. Child well.

(ii.) E. L., of —— (No. 316). Four healing vesicles; very little areola. Child well.

(iii.) C. L., of —— (No. 317). Two well-formed vesicles commencing to dry up; areola moderate and fading. No rash; no enlarged glands.

(iv.) C. J., of —— (No. 318). Four healthy vesicles drying up; little areola. Child well.

(v.) P. C. S., of —— (No. 319). Four good vesicles drying up; little areola. Vaccination normal. Child well.

(vi.) V. M. W., of —— (No. 320). Child suffering from constipation and abdominal pain. It had been ailing since birth and, except that it was more irritable since vaccination, did not seem worse. Vaccination appeared to have been normal; there were four healthy vesicles, with drying scabs and little areola. The child had a good deal of eczema on arms and buttocks. The mother was very ill before it was born, and suffered from placenta previa.

(vii.) A. C., of —— (No. 321), A delicate-looking boy. There had been considerable inflammation of the vaccinated area, which was fading. There were enlarged glands in the axilla, and four unhealthy-looking, indolent sores, with muco-purulent discharge, but no trace of induration. I saw this case again on the 11th November, when all inflammation had subsided and the area was healing rapidly.

Sub-vaccinees. None.

Course of vaccination. The child died within three days of vaccination. After death nothing was visible at the points of inoculation except minute scratches in two places and one small speck of blood about the size of half a lentil at the upper and outer point of inoculation. There was no sign either of the formation of vesicles or of inflammation round the points of insertion. There was no evidence of irritation of lymphatics or of enlargement in the glands of the axilla. In fact from the appearance of the arm it would appear that the process of vaccination had hardly commenced.

Course of illness. On the day after vaccination the child was first noticed to have a cough and she began to vomit after food; she was at this time fed entirely at the breast. No other particular change was noticed by the mother except that the child was irritable and fretful. Mrs. C., the mother, did not obtain medical advice because she did not think that the child appeared much worse than she had seen her previously. On Thursday night, the 27th October, she went to bed about twelve o'clock and slept with the child in her arms until a quarter to eight a.m. When the parents awoke in the morning the child was dead in the mother's arms. As far as the mother could remember she did not suckle the child during the night, and the last time that she saw her alive was before she went to sleep on the previous night. The child lay between herself and her husband and another child lay at the foot of the bed. Mr. S., of ——, who was called in, writes:—"I was called at "7.45 a.m. on Friday, 28th, and arrived at —— Street "at 7.50 a.m. The message given by the father of the "child to my parlourmaid was 'that he had just turned "'over in bed and found the baby dead.' When I saw the "child it was wet and quite cold, the woman said they had "given it a bath. Rigor mortis had set in; knees and "shoulders rigid. From what I saw and what I was told "I came to the conclusion that it was an ordinary case of "overlaying. The mother in reply to a question I put to "her did not remember when she fed the child last." I have seen Mr. S. and he has nothing to add to his letter.

Previous history. As will be seen from the depositions taken at the Coroner's inquest, a copy of which is appended to this report, the child's previous history was bad. She was prematurely born at the seventh month, and on more than one occasion had been an out-patient at the Westminster Hospital, and had also probably attended the dispensary in ——. The mother said in her evidence that she never expected the child to live.

It was stated on E. M. C.'s out-patient letter at the Westminster Hospital, dated the 15th September, that she was suffering from diarrhœa, snuffles, and mucous tubercles round anus, and Dr. Walsham gave Mrs. C., the mother, a certificate declaring that the child was unfit to be vaccinated. As far as can be ascertained, this was the last occasion on which the child was taken to a doctor for medical treatment. Dr. Walsham, whom I have seen, informs me that, although he has no distinct recollection of the case, he has no doubt that he believed that the child was suffering from congenital syphilis, and that he implied this by the notes which he made on the out-patient letter.

Mrs. E. L., who lived in the same house as Mrs. C., the mother, stated that the child, who had always been delicate, used sometimes "to go as white as marble" and was inclined to be convulsive. She thought that after the child was six week old her condition began to improve, but subsequently to this date she is known to have suffered from diarrhœa and snuffles. Ths mother states that she first noticed these attacks in July and that they only last for a short time; a very severe one occurred four weeks before the child's death, and the mother described its condition then as having been "very bad." She thinks that these attacks probably occurred about every fortnight.

A week previous to the vaccination the mother saw some person who presumably was the Vaccination Officer, since he came to inquire about the vaccination. She told him that the child was delicate, and she hoped that he would "speak up for her on the Tuesday when the child was "vaccinated." It seems that she herself said nothing to Dr. E. L. W., and she states that he made no kind of inquiry as to the child's present or previous condition. This statement is denied by Dr. E. L. W., who says that he knew that the child was five months old, and that he thought he had seen her before and had ordered her cod-liver oil. He stated that he looked at the child and said that she was not strong, but that as there was small-pox about he thought she ought to be vaccinated. He practically, however, admitted that he did not make any examination and did not do more than superficially look at the child.

Tuesday, the 25th October, was a cold, wet day, and the child, who had seldom been taken out, owing to her feeble state of health, was taken to the vaccination station at ten and not brought back until twelve. On the same day she was taken by the mother to a mothers' meeting and not brought home until four in the afternoon; so that on this day, when the child was little accustomed to exposure and had been vaccinated, she was away from home for at least four hours. The next day the child began to cough and to vomit.

Nothing important elicited.

Mr. T. B. made a post-mortem examination on Saturday, the 29th October, at the mortuary at ——. The child weighed seven pounds twelve ounces. It was small but not particularly emaciated. The skin was clear and there was no eruption. There were no mucous tubercles about the anus or mouth, and there was no external evidence that the child had suffered from congenital syphilis. There were no external signs of violence. The lungs showed a general want of expansion and in places were collapsed. There was no evidence of pneumonia or of any acute inflammation. The heart was natural. The left kidney was much engorged, the right kidney was natural. Spleen natural. The stomach contained about two ounces of partially coagulated milk mixed with mucus. The intestinal tract throughout was pale, and only at its lower end contained a small quantity of fæces. On the surface of the brain there was much venous engorgement. Its substance was pale. There was no sign of tubercle in the pia mater. There was no other evidence of disease in the body. The post-mortem examination gave no evidence of any abnormal condition due to vaccination, and, as has been stated, the points of inoculation showed no sign that the process of vaccination had commenced. Apart from the previous history (which had not then been obtained), it appeared probable to Mr. T. B. that the child had died of inanition, owing to her premature birth and consequent feeble condition.

There is no evidence to show that the child's death was either caused or accelerated by the act of vaccination, although it seems probable that owing to its previous long continued ill-health, the cold and wet to which it was exposed on the day of vaccination started a catarrh which apparently was the cause of the cough and the vomiting. It is much to be regretted that a child in such a condition should have been vaccinated, and it did not appear from the evidence adduced at the inquest that the vaccinator exercised reasonable care in making an examination of the child, whom he knew to be feeble and whose vaccination had been postponed on a previous occasion owing to the delicate state of its health. No evidence was brought forward at the inquest to show that death was due to the cause surmised by Mr. S. (viz., overlaying), although from the history of the case and from the position in which the child was found dead it would seem to be a reasonable supposition.

THEODORE DYKE ACLAND, M.D.

Copy of Depositions taken at Inquest.

Information of witnesses taken and acknowledged on behalf of our Sovereign Lady the Queen touching the death of E. M. C., at ——, on Monday, the thirty-first day of October, One Thousand Eight Hundred and Ninety-two, and by adjournment on Tuesday, the first day of November, One Thousand Eight Hundred and Ninety-two, before J. T., Esquire, Her Majesty's Coroner for ——, on view of the Body of the said Person then and there lying dead as follows:—

G. C. sworn saith:

I live at ——. I am a scullery man. The deceased is my daughter E. M. C. She was five months old. She is my fourth child. She was a seven months child. She was seen at Westminster Hospital as an out-patient, six weeks ago, once. She was seen at the ——, dispensary once, two months ago. She was vaccinated last Tuesday at——. She was always a weakly child from birth. Death occurred on Friday morning at 7.45. No doctor saw her between the vaccination and her death. She was getting on nicely up to Tuesday, picking up in flesh. After Tuesday she could not keep the contents of the stomach down, vomited, got cold, was feverish. This was an increase since vaccination. I did not think she was bad enough to call the doctor. She was not vaccinated before. She was certified as not being fit to be vaccinated two months ago from Westminster Hospital. I did not make any objection myself to the doctor vaccinating her.

E. C. sworn saith:

I am the wife of last witness. The deceased is my fourth child. She was weak. I did not expect to rear her. She was fed entirely by breast all her life. I had enough for her. I took her to be vaccinated last Tuesday at —— dispensary, by Dr. E. L. W. I said nothing to Dr. E. L. W. He asked me no questions about her. He made no examination of her. He had never seen the child before. I saw a man who brought me a notice last Monday about the vaccination. I told him how delicate she was. She was last seen by a doctor on September 15th at Westminster Hospital. Once before (September 14th) I went into the surgery and got a grey powder for her. She was seen when quite a baby by Mr. C. at the —— dispensary. He came three or four times. I thought the child was getting on, picking up flesh. She weighed a pound and a half at birth. She took the breast, she kept down the milk up to Tuesday. I seldom took her out, she was too delicate. I took her out at 10.30 to be vaccinated. I was back by 12. I took her out in the afternoon. I held the child when the operation was taking place. It was in four places. On Wednesday the child was fretty and cried very feebly on Wednesday afternoon. She was very convulsive at times and had deep long sleeps. She first vomited on Wednesday after drinking a great deal of milk. This continued up to her death. I did not call a doctor because I did not notice much difference in her appearance. I went to Mrs. F.'s mothers' meeting at ——. I came out at 4. I took the child straight home. It was raining, but I wrapped her up very warm. There was no alteration to the time of her death. She had no cough on Monday or Tuesday. I first noticed a nasty cough on Wednesday. This continued to her death. I noticed the cough before she vomited. She only coughed immediately after she had the breast and brought up the food. She had the snuffles from her birth in her nose. She had it all her life. I had powders from the Hospital for a week. She seemed all right from diarrhœa after that. She never had vomiting before vaccination, not even a little. She never had convulsions before vaccination. There was no medical attendance between September 15th and last Tuesday. My health has been very good since the birth. I do not know the reason the child was seven months. My other children are well. The vaccination marks did not come up. There was no alteration whatever in them. There was nothing done to the marks. I did nothing to them.

E. L. sworn saith:

I am married. I live at ——. I have known the parents two years. I was present at the birth of the child. It was very small. I have frequently seen the child since. I

have children of my own. The child was always delicate. I never saw it vomit. It was as white as marble sometimes. I never heard it cough. The child has been improving since it was six weeks. I saw it all Monday morning. I did not take particular notice of it. I saw it on Tuesday last but not to notice. I saw it on Wednesday not to take any notice. I saw it on Thursday, I took no notice of it. I know the mother; she has been well during the child's life. The child seemed to get on except for a cold. She seemed inclined to be convulsed when "white as marble." I saw this twice, once when the dispensary doctor was sent for at six weeks ago. Another two weeks before she went to the Hospital for diarrhœa.

E. C. (recalled) saith:

The child very often had the "white as marble" appearance. I first saw it in July. She had these appearances perhaps once a fortnight. The last was four weeks next Sunday ago. I had no doctor on any of these occasions.

T. B. sworn saith:

I lived at ——. Lecturer on forensic medicine at Westminster Hospital. I made a post-mortem examination in the presence of Dr. Acland on Saturday. The body weighed 7 pounds 12 ounces; the body was very bloodless. The skin very white. It was not emaciated but very small for a child of five months. On opening the chest I found the lungs in rather a sodden and non-elastic condition. There was no mark of congestion. The appearance showed breathing, and circulation had been very feeble. Heart natural, not diseased. No blood in the cavities except a small quantity in right ventricle. Stomach very thin, mucous membrane absolutely pallid. It contained about one ounce of clotted milk and mucous in equal proportions. Intestines were almost empty and very white and thin. Liver and spleen healthy. Right kidney healthy; left congested. I opened the brain; it was pallid; veins on surface congested. I found no organic disease. General appearance indicated death from debility. I think there was a want of breathing power. I think there was probably a chill on Tuesday. There were three vaccination marks on left arm. They were merely scratches, only one had drawn blood. There was no inflammation underneath scratches. The vaccination had absolutely nothing to do with the death.

E. C. (recalled) saith:

At 7.45 a.m. on Friday I was in bed with the child in my arms. I had been to sleep up to that time. I cannot remember when I last fed it. The breast was in its mouth. I last remember it alive when I went to bed about 12. I laid it between me and my husband; my little boy lay at the foot of the bed. The bed is double full-sized bed. The child was on my left arm. Its face towards me, not touching me. I noticed no convulsions.

E. L. W. sworn saith:—

I live at ——. I am Public Vaccinator for this district. I saw the child on last Tuesday about 11, between 10 and 12. I do not remember who brought it. It was five months old. I knew that at the time, I believe. I looked at the child first and saw it was not strong. It was thin. My impression was it was a postponed case. I thought I had seen it before and had advised the mother to give it cod-liver oil. I said the child had better be vaccinated. I only looked at the child. I cannot remember if I asked the mother questions about the child. It is my custom to vaccinate in four places. I always examine the child. I made sufficient examination of the child. I satisfied myself it was fit to be vaccinated.

CASE 196, REPORTED TO THE COMMISSION by MR. J. H. LYNN.

Case of C. E. S.: report to the Commission of Dr. Theodore Dyke Acland.

Vaccination. C. E. S., of ——, was vaccinated by Dr. W. M. L., Public Vaccinator, of ——, on the 16th July 1891.

Alleged injury. Rash round vaccination marks and ulcerous spots all over body.

Source of lymph. According to Dr. W. M. L. from the arm of E. G. S., of ——. Mrs. S., the mother of this child E. G. S., informed me that no children were vaccinated direct from her child's arm, but that lymph was taken from it and stored in tubes.

Vaccinifer (?). E. G. S., now (October 1892) aged two months, is a fat, well-looking baby, extremely dirtily kept. The mother assures me that vaccination pursued a normal course, that the child had neither rash, enlargement of glands, nor any sore upon its body. There are now four slightly marked cicatrices. There is no sign of any constitutional disease in the child, no eruption, and no enlargement of glands. She is suffering from slight bronchitis and has had ophthalmia, which she is believed to have contracted from her eldest sister, who has recently suffered from that disease.

Co-vaccinees (?). I was informed in the first instance that seven children were vaccinated from E. G. S., namely, C. E. S., the subject of this report, D. S. B., and five others. Subsequently Dr. W. M. L. informed me that the child D. S. B. was not vaccinated from E. G. S. The whole of the information with regard to this case is, however, unreliable, as will be seen from the following quotations from a letter received from Dr. W. M. L., dated the 14th November 1892:—"D. S. B. was not vaccinated from E. G. S. The "other six, including C. E. S., were . . . . Mrs. S." (the mother of E. G. S.) "told my assistant definitely "that I had vaccinated so many from her child that she "remonstrated with me about it. (Six were done.) She "next informed you that tubes only were taken. To-day "she informed Dr. W. that she had given two different "versions because she feared she might get herself and "others into trouble, and she did not want to have any "bother about it, &c., but at the same time reluctantly "admitted that both children were vaccinated and tubes "also taken."

I visited the homes of all six children said, in the first instance, to have been vaccinated, besides C. E. S., the subject of this report, from E. G. S., with the following results:—

(i.) D. S. B., of ——. Mrs. B., the mother, informs me that the child was not vaccinated at the station by Dr. W. M. L., but was vaccinated privately at his house, and that she paid because she wished to have the child vaccinated in two places instead of four, the number required for public vaccinations. Vaccination is said by the mother to have pursued a normal course with no complication. There are now said to be two scars on the arm. I saw the mother, but was unable to see the child as it was said to be away.

(ii.) L. V. P., of ——. The child's parents had moved from the address given more than a year ago, but the present occupant of the house, who knew Mrs. P., the mother, informed me that the child's vaccination gave no trouble and that the arm healed well.

(iii.) B. F., of ——. Vaccination normal, without any complication. There are four healthy-looking scars. The child has no rash upon her body, and seems well.

(iv.) R. G. H., of ——. A well-nourished, healthy-looking child. Vaccination is said to have been normal, without complication, and the mother assures me that the child never had a spot on its body in its life, and "was "never better than at present." There are four healthy scars.

(v.) C. J. W., of ——. Vaccination normal, without complication. There are now four small scars and the child is well.

(vi.) S. G., of ——. Vaccination, which was performed when the child was five months old, pursued a normal course without complication. The child had suffered before from bronchial catarrh, and has had some catarrh since. At the time of my visit (8th November 1892) he was well. There are four normal scars.

Sub vaccinees. None.

Course of vaccination and illness. Both Mr. and Mrs. S., the father and mother of the child C. E. S., the subject of this report, agree in stating that the child's vaccination pursued a normal course until at least fourteen days after vaccination. The mother says that the child was taken for inspection on the eighth day, and that the vesicles presented no abnormal appearance until the end of the second, or the beginning of the third, week after vaccination, when sores began to form at the points of inoculation. The child at this time scratched his arm very much, causing four open wounds which tended to coalesce, and from which there was a considerable amount

of purulent discharge. The mother states that wherever the pus touched the arm it formed a sore, and that when the child scratched his arm and then scratched another part of the body, sores formed in those places. She believes that the sores on the body were started by the child scratching after his fingers had been contaminated with pus from the vaccinated arm. There does not appear to have been any eruption except in those parts of the body which the child could reach by scratching, and the mother says that this was the case. No application was made to the sores except some ointment which Mrs. S. obtained from an herbalist, the nature of which I was unable to ascertain.

At the time of my visit, on the 8th November 1892, I found the child fairly well nourished but with some evidence of rickets. He had been suffering from diarrhœa, and had also a slight vesicular and erythematous eruption on the body, such as is extremely common during the period of dentition. There were two minute vesicles on the right flank, and one small shallow sore covered with a scab, without any surrounding induration, on the left arm below the vaccination marks. No importance can be attached to these eruptions. There are four healthy-looking scars at the point of vaccination, without induration; one is a little irregular. There are two scars on the occiput devoid of hair, one as large as a halfpenny, pinkish, irregular, without induration, and the other the size of a threepenny piece. These scars are the remains of ulcers which appeared on the head within a month of vaccination. There were a few shotty glands on both sides of the neck, but none in the axillæ.

The mother states that when she came back from the vaccination station on the eighth day she applied a cold bread poultice to the vesicles, but she says that subsequently she made no application to them whatever, and did not continue the application of poultices for more than a few hours. Mrs. S. also says that she treated the arm with great care, but reasonable doubt may be thrown upon this statement by the fact that, although it is now nearly a year since the child ceased to suffer from sore upon its head, the lining of his hat is still saturated with the pus with which it was soaked when the child was ill, and Mrs. S. has been *thinking* for the last year of having it changed.

Nothing of importance elicited.

Nothing of importance elicited. C. E. S. is the youngest of three children; the eldest, a girl of six years old; the second, a boy of four; neither of whom have had any similar eruption. About a month after the vaccination the mother's arm became inoculated with pus from the wounds on the child's head.

Unimportant to the inquiry.

The child suffered from impetigo due to irritation of the vesicles towards the end of the second or the beginning of the third week after vaccination. There is no evidence to show that the disease was aggravated by any act on the part of the vaccinator, and the present condition of the child stated to have been used as vaccinifer gives ground for believing that if he was the source of lymph he was fitly selected. The eruption from which the child suffered seems to have been an accidental complication of vaccination, and not an essential part of the process.

THEODORE DYKE ACLAND, M.D.

CASE 197, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of T. S.: report to the Commission of Dr. Arthur Pearson Luff.

In March 1893 I was requested by the Commission to investigate the circumstances attending the death of T. S., late of——, and the alleged connexion of the death with vaccination.

The entry in the register of the death of the child was to the effect that T. S., thirteen months of age, died on the 18th October 1892, the cause of death being certified by Mr. R. H., L.R.C.P., of ——, as "vaccination; traumatic "erysipelas."

Mr. R. H. subsequently stated that he did not himself vaccinate the child (who was in fact vaccinated by Mr. G. W. S., M.R.C.S., Public Vaccinator of ——), adding in his letter that the child "was brought to me about three "weeks after being vaccinated, when I found three "unhealthy ulcers on the right arm discharging sanious "matter, and from these erysipelatous inflammation first "made its appearance, extended down the arm, across the "chest and abdomen to the feet, and throughout the "surface of the body generally. I attended the child two "months, when it died from exhaustion. I am the "family's medical attendant, and have been for years "The father is a collier with a large family. I have "attended the child almost from birth up to a short period "of its being vaccinated; it has always been a delicate one, "being subject to frequent attacks of bronchitis, and "brought up under the most unfavourable circumstances "and hygienic surroundings; in fact, the whole members "of the family are generally unhealthy. For instance, "I attended the father twelve months ago for pyæmia, "the result of a slight injury to one of his fingers; the "mother has a large bronchocele, and one of the daughters "has been treated for anæmia. I shall be glad to give any "further information if required."

Mr. G. W. S., the Public Vaccinator by whom the child was vaccinated, wrote as follows with reference to the case: "I have much pleasure in giving you all the particulars "I am aware of respecting the child T. S. He was vac-"cinated by me on August 2nd and inspected on August "10th, but was not in perfect health at the time owing to "unhealthy surroundings and means of bringing up; "still there did not appear to me to be any valid reason "for not vaccinating him then. I knew the family slightly, "previous to the date of operation, but I never saw the "child afterwards, or heard of it till some little time after "its death, so that I am unable to give any history of the "subsequent stages of its illness, which I find was treated "by Mr. R. H., of this town. (At the date of inspection, "August 10th, the arm was going on perfectly normally.) "Several other children were vaccinated from the same "source as this one, and all did well. I may add that I "take every precaution I possibly can in performing the "operation, such as scrupulous care in having my lancet, "etc. clean and sharp, avoidance of lymph contaminated "with blood, or which is in the slightest degree purulent, "or any which is derived from unhealthy children. I "have difficulties to contend with in —— in keeping up "a high standard of efficiency in vaccination owing to "some private practitioners making only one small punc-"ture in each case, while I, of course, insist on the full "number and area required by the Local Government "Board. I shall be happy to give any further informa-"tion in my power to the Commission should they so "desire it."

From information given to me at —— by Mr. G. W. S., the vaccinator, and by Mrs. S., the mother of the deceased child T. S., I ascertained that the deceased was vaccinated at the age of 11 months, the vaccination taking place on the 2nd August 1892. The vaccination had been delayed on account of the child having been weak and suffering from rickets, the mother having had sixteen children, four of whom died of tubercular disease.

The child, T. S., was vaccinated from another child, E. B., and when inspected on the 10th August (eight days after vaccination) the vaccination marks were well developed, and there was then no appearance of anything abnormal; but on account of the unsatisfactory history of the child, Mr. G. W. S. did not think it advisable to vaccinate other children from him. On the ninth day after vaccination the mother stated that she noticed a red patch on the skin between the vaccination marks and the elbow on the left arm, and that she took it the same day to Mr. R. H., who said the child had erysipelas. The inflammation spread over the body to the other arm and legs, and later on there was swelling of the penis, scrotum, and all the extremities. The child did not suffer from convulsions, vomiting, or diarrhœa at any time. The deceased gradually wasted and sank, death occurring two and a half months after vaccination.

Sanitary surroundings

On inspecting the sanitary arrangements of the house I found that there was a W.C. situated about five or six feet away from the back door of the house. This was not provided with any water flush and was in a very dirty and malodorous condition.

I next interviewed Mr. R. H., the medical man who attended the child, and who certified the death. He informed me that the child had not been brought to him until about two or three weeks after vaccination, though the mother stated that she had taken it on the ninth day after vaccination. In his opinion the child was suffering from erysipelas, and he informed me that he considered the erysipelas was inoculated at the time of vaccination with

the vaccine virus. This statement he subsequently modified by saying it might or might not have been introduced at the time of vaccination, and shortly after that he stated to me that he had changed that opinion, and considered that it could not have been introduced at the time of vaccination. Owing to these discrepancies in the stated opinion of Mr. R. H., I requested him to send me in writing what his opinion as to the relation of the erysipelas to vaccination actually was, and on the 15th March 1893 I received from him the following letter:—

"Dear Sir,

"I adhere to my original death certificate of the case of the child T. S., and that it was caused through the vaccine virus introduced, and I intend to produce evidence in support thereof.

"Yours very truly,
"R. H., L.R.C.P."

Upon inquiry at —— I found that the Infectious Diseases Notification Act was in force during August 1892, that erysipelas was one of the diseases requiring notification, but that Mr. R. H. did not notify the case of T. S. as one of erysipelas to the Medical Officer of Health.

Vaccinifer. I next proceeded to see the vaccinifer of T. S., namely E. B. of ——. I found her to be a healthy child in whom vaccination had run a normal and successful course

Co-vaccinee. From E. B. two children had been vaccinated, namely, T. S., concerning whom this inquiry has been made, and N. F., of ——. This child, N. F., I saw and found her to be in a healthy state, the vaccination having run a normal and successful course.

Conclusion. Although the death of the child T. S. was certified as due to erysipelas, death occurring two and a half months after vaccination, yet the case was not notified as one of erysipelas. However, assuming that the child did die of erysipelas or of weakness produced by erysipelas, I am of opinion that this erysipelas was not inoculated at the same time as the vaccine lymph, for the following reasons:—

(i.) According to the statement of Mr. G. W. S., the Public Vaccinator, the child was not suffering from erysipelas when inspected by him on the eighth day after vaccination.

(ii.) According to the statement of Mrs. S., the mother of the deceased, she took the child to Mr. R. H. on the ninth day after vaccination when he said that the child was suffering from erysipelas.

(iii.) According to the statement of Mr. R. H. himself, the child was not seen by him until about the second or third week after vaccination when he first diagnosed erysipelas.

(iv.) E. B., the vaccinifer of T. S., was in a healthy condition when seen by me and had never suffered from erysipelas.

(v.) N. F., who was vaccinated from E. B. at the same time as the deceased T. S., never developed erysipelas and the vaccination pursued a normal course.

ARTHUR PEARSON LUFF, M.D.

CASE 198, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of C. A. W.: report to the Commission of Dr. Theodore Dyke Acland.

Vaccination. C. A. W., of ——, was vaccinated by Mr. W. G. G., M.R.C.S., assistant to Mr. J. V. B., L.S.A., on the 22nd September, 1892.

Death. 7th November 1892.

Certified cause. "Vaccination, six weeks four days; cellulitis, four weeks; exhaustion."

Certified by. Mr. J. V. B.

Source of lymph. Calf lymph stored in tubes obtained from Dr. R.

Co-vaccinees. Mr. J. V. B. believes that three children were vaccinated at the same time as C. A. W.; of these one, whose name was given as M., of ——, cannot be found. I visited the house, but was unable to obtain any clue to the child. The other two children are:—

(i.) S. L., of ——. A typically healthy baby in whom vaccination pursued a normal course, without any complication. Two insertions were made, two vesicles formed, and there are now (15th November 1892) two normal healthy-looking scars.

(ii.) L. H., of ——. A healthy-looking child, said to be well. Vaccination was normal without any complication. Three insertions were made, but only two vesicles formed; these have left two small rather deep scars, which are quite healed, and round which there is no induration.

Sub-vaccinees. None; vesicles not opened.

Nothing of importance elicited.

Method of vaccination.

Course of vaccination and illness. The vesicles formed well and naturally. On the eighth day the arm was inspected, and was believed by the mother and by Mr. W. G. G., the vaccinator, to be normal. On the twelfth day the baby was nursed by her sister, a child about six or seven years old, who lifted her by the arm. The mother noticed that when thus lifted it seemed to be in pain. The next day the arm began to inflame. Mrs. W., the mother, thought this might be due to some injury done to the arm by the sister. The vesicles, however, do not appear to have been rubbed off or injured. The following day, the fourteenth since vaccination, the mother noticed little red dots "like flea-bites" below the vesicles, and subsequently "a little stream of red went up from "them towards the armpit" and a lump formed in the axilla. The child at this time was evidently suffering from lymphangitis. On the 7th October she was seen by Mr. W. G. G., and on the next day, the 8th, by Mr. J. V. B., who ordered poultices to be applied. Up to this time the scabs were adherent and there was no discharge, but after the application of the poultices the scabs came off and there was a good deal of purulent discharge from the wounds. The redness gradually spread to the finger tips, and subsequently over the body, disappearing in one place and reappearing in other, leaving considerable œdema when it subsided. Pus formed in five or six places, and incisions were made. The child never rallied, and died of exhaustion on the forty-sixth day.

Treatment of vesicles. The vesicles are not known to have been rubbed or injured; no application was made to them except under medical advice. No shield was used.

General surroundings. Reasonably good. The house is poor but not very dirty, and nothing offensive was found in the living rooms. I could obtain no evidence of any infectious illness or of any person suffering from a suppurating wound in the house. Neither Mr. W. G. G. nor Mr. J. V. B. were attending any septic case at the time.

Sanitary surroundings. Bad. Mrs. W., the mother of the child, states that last spring the drains were so offensive that they were put right by order of the sanitary officer and that there have been no bad smells since, but the floor of the dwelling-room is considerably below the level of the street, and is flush with the pavement in the area, and when there is much rain the rooms are flooded unless the bell trap leading to the sewer is removed. The mother says that this trap is removed nearly every night before they go to bed. There is no water supply to the closet, and the water leaks through and down the closet wall from the cistern which is supposed to supply it. The drinking water is derived from a cistern without a lid, and Mrs. W. states that the cats sit on the boards, which inadequately cover it, and their filth drops into the water supply. Under such conditions it can be no matter for surprise if the inhabitants of the dwelling are unhealthy.

Family history. Nothing of importance ascertained. There are three other children said to be well, but they are anæmic and evidently not robust.

Previous history. Nothing of importance elicited.

Conclusion. The child died of cellulitis originating in and spreading from the vaccination wounds. I have not been able to obtain any evidence to show whether the wound was subject to external contamination; but the results obtained in the other children vaccinated with the same lymph, but who were living under more advantageous conditions, give no ground for the belief that the lymph or the method of vaccination was at fault. The fact cannot be disregarded that the infant was living under unwholesome conditions, and that the first signs of lymphangitis occurred the day after it was lifted by the arms, this being on the twelfth day when the areola would be at its height.

THEODORE DYKE ACLAND, M.D.

Case 199, reported to the Commission by the Coroner.

Case of E. S.: report to the Commission of Dr. Arthur Pearson Luff.

On the 14th November 1892, at the request of the Commission, I proceeded to ——, and on the 15th attended the adjourned Coroner's inquest touching the death of E. S., aged six months, who died on the 8th November. A communication had previously been received by the Commision from the Coroner to the effect that information had been received by him of the death of E. S. from (according to the certificate of Dr. T.) "inflammation "of the arm after vaccination," that he had on the 10th November opened an inquest on the case, and that he had adjourned it until the 15th November.

A post-mortem examination was made on the 12th November by Dr. T.

At the inquest on the 10th November, the evidence of E. S., the mother of the child, of ——, was to the effect that the deceased was her seventh child, and that she was fed on the breast only. When five weeks old she had a fit, and Dr. H., who was called in, ordered milk and lime-water in addition to the breast milk. The doctor attended several times and told her that he considered the child a weak one, and at one time he did not expect her to live. On the 13th October she took the child to Dr. C. O. R., Public Vaccinator, of ——, who vaccinated her. The deceased seemed to go on well for a week, the inspection of the child by the Public Vaccinator taking place on the 20th October, seven days after vaccination, when the case was entered in the register as a successful vaccination. Shortly afterwards the child seemed to become ill and the arm to be inflamed. On the 4th November she called in Dr. T., who ordered linseed poultices to be applied to the arm. The arm, however, became much worse and the child died on the 8th November. Deceased's life was insured in the Prudential Assurance Company. The deceased was last seen by Dr. T. on the day of her death. Previous to calling in Dr. T., the mother had applied poultices and cream to the bad arm.

At the adjourned inquest, on the 15th November, the same witness, in answer to questions put by me, said that the deceased was a weaker child than her others. (On the 2nd November (twenty days after vaccination) she noticed that one of the vaccination spots was worse than the others, but she called in Dr. T. on the 4th November not for the condition of the arm, but for the fits the deceased was then suffering from. The arm got worse after the 4th November; one of the vaccination spots became larger than the others, of a yellowish colour, and the arm appeared red and swollen down to the elbow.

The evidence of Dr. C. O. R., of ——, Public Vaccinator for the district, was to the effect that on the 13th October 1892 he vaccinated deceased and six others from the arm of N. S. He saw the child again on the 20th October, and he found that all the three vaccination spots had taken in a successful manner. All the other six children vaccinated from the same vaccinifer were seen by him on the same day, and were all well.

The evidence of Dr. T., of ——, was to the effect that he first saw deceased on the 4th November, when he was called in for what was called a fit. The child was not in a fit when he saw her. He noticed that the left hand was much swollen, and that the upper part of the night-dress of the left arm was stained of a dirty greenish yellow colour as if from pus. On examining the left arm he found a poultice upon the upper part. On removing the poultice he found a sloughing sore produced from the lower vaccination pock; the two upper vaccination marks being cicatrised. He ordered flannel fomentations and calamine to be applied to the arm. He saw the deceased every day till death; the sore got worse, the child developed symptoms of fever, which was due, he believed, to inflammation of the arm and absorption of septic matter from the sore. He believed that death resulted from the same cause. On the 12th November he made a post-mortem examination of the deceased. The body was well developed and well nourished. The circumference of the left arm at the level of the sore was six and a half inches, that of the right arm at the same level was four and a half inches. The sore was a grey sloughing foul ulcer, with the peculiar odour of decomposing septic matter. The size of the ulcer was one inch long by half an inch broad and half an inch deep; the ulceration extending down to the muscles of the arm. There was a bluish discolouration round the sore, and the tissues round the edge of the sore were soft and pulpy, the softness reaching from the margin of the sore one inch in front and three inches behind. The glands in the left axilla were considerably enlarged. He found the spleen rather larger and softer than natural. The other organs of the body were normal. He considered that the cause of death was septicæmia from the absorption of septic matter from the ulcer or sore on the left arm. He also considered that the condition of the sore was not due to vaccination; if it had been he would have expected all the three vaccination marks to be similarly affected, and also that they should have been affected much sooner after vaccination. He considered that the septic condition of the sore was due to dirty or improper treatment of it.

Post-mortem examination.

"The deceased died from inflammation of the arm after "vaccination, which inflammation was caused by some "poisonous matter gaining access to the sore, but how "such poisonous matter was introduced there is no "evidence to show."

Verdict of Coroner's jury.

I have made a thorough inspection of the house where the child lived, and also of all the other children vaccinated from the same source. The house of the parents is in a good sanitary condition. There have been no cases of erysipelas in the vicinity or amongst friends of the deceased's parents.

I have seen and examined the other six children vaccinated from the vaccinifer N. S., and have also seen and examined N. S. All seven children were in a healthy condition, the vaccination marks were normal and well cicatrised.

Vaccinifer and co-vaccinees.

The deceased evidently died from exhaustion consequent on the absorption of septic poisonous matter from the ulcer on the arm. This attack of septicæmia could not have been due to the introduction of septic matter with the vaccine lymph, since in such case:

Conclusio

(i.) Septicæmia would have appeared much earlier than it did;

(ii.) The other marks would probably have been similarly affected; and

(iii.) The other children vaccinated from the same source would also probably have been similarly affected.

The implantation of the septic matter must have been from without, and in my opinion was due to the vaccination sore not being kept properly clean and to the neglect of antiseptic precautions in the treatment of it.

Arthur Pearson Luff, M.D.

Case 200, reported to the Commission by the Local Government Board.

Case of E. S.: report to the Commission of Dr. Arthur Pearson Luff.

In December 1892 I was requested by the Commission to investigate the circumstances attending the death of E. S., late of ——, and the alleged connexion of the death with vaccination.

The entry in the register of the death of the child was to the effect that E. S., one and three-quarter months of age, died on the 6th November 1892, the cause of death being certified by Dr. D. A. E., of ——, as "erysipelas "six days; vaccination, 21 days."

Dr. D. A. E. subsequently wrote with reference to the case to the effect that he attended the deceased child E. S., and certified the death as due to erysipelas and vaccination, and that he believed that vaccination was the primary cause. He was not the vaccinator of the child, and the mother informed him that the vaccination went on satisfactorily up to the tenth day, on which day the erysipelas appeared on the vaccinated arm and gradually extended to other parts of the body. The other children of the family were healthy, but the sanitary condition of the premises in which the parents of the child lived was most unsatisfactory. There was no disease of an infectious nature in the neighbourhood so far as he knew.

Mr. T., Public Vaccinator, of ——, by whom the deceased child was vaccinated, wrote with reference to the case to the effect that he was unable to offer any particulars of the vaccination of the deceased, except that the lymph was taken from a very healthy-looking child, with well-

developed pustules with no redness around them, and that the deceased was brought to him a week after vaccination when he found the usual results, and after that occasion he did not see or hear anything more of the child.

I proceeded to —— on the 20th December 1892, and first interviewed R. S., the mother of the deceased child, who stated that the child was a full-term one, and was strong and healthy, and was fed entirely at the breast. The child was vaccinated on the 17th October 1892, when five weeks old. The vaccination went on well at first, and on the 24th October she took it to the medical man (Mr. T.), who had done the vaccination, when the matter was removed from three spots; three out of the four spots having taken. On the following day, the 25th October (eight days after vaccination), the left hand and arm (the vaccinated one) began to swell and redden, the redness extending to the middle of the forearm. The child did not suffer from either sickness, diarrhœa, or convulsions, either at this period or at the time of death. The swelling and redness extended up to the shoulder over the back to the other arm, and then over the body to both legs. The skin was red, hard, hot, and swollen. So far as she knew there was no erysipelas and no bad wounds in the vicinity of her house, or among those attending upon the child. So far as she knew, the vaccination marks never at any time appeared unusual, and at the time of death they were nearly healed.

I next interviewed Dr. D. A. E., the medical man who attended the child and certified the cause of death. He first saw the child on the 29th October (twelve days after vaccination), when it was suffering from undoubted erysipelas. The vaccination marks did not look in a very unhealthy condition. They were discharging healthy pus; there was no sloughing at the edges and they appeared to be getting better up to the time of death. The temperature of the child, from the 29th October to the date of death, varied from 102° to 104°, and the erysipelas gradually spread over the left arm and over the body.

I next interviewed Mr. T. the Public Vaccinator, by whom the deceased child had been vaccinated. He informed me that the deceased had been vaccinated on the 17th October from another child F. J. S—d, and that two other children had been vaccinated at the same time from the same vaccinifer, and that, therefore, three children had been vaccinated from the vaccinifer F. J. S.—d, namely, E. S., concerning whose death I was making this inquiry, J. C., and A. E. B. He also informed me that all these children were dead, but that the deaths of the two last-mentioned ones were not in any way connected with vaccination. He told me that he had attended the two last-mentioned children up to the time of death, and that J. C. died on the 3rd November 1892 from acute bronchitis for which he had attended the child from the 28th October. At the time of death the vaccination marks were normal and healed, and he did not in any way connect death with vaccination. With regard to the second co-vaccinee, the child A. E. B., he informed me that he had attended upon her constantly from her birth, as she was a weakly child and suffered from tubercular disease, tabes mesenterica, and tubercular meningitis. The cause of death was marasmus from tubercular disease, and, in his opinion, there was no connection whatever between vaccination and death; and further, he was sure that tubercular disease undoubtedly existed previous to vaccination.

I next proceeded to see the vaccinifer, and the relatives of the two co-vaccinees.

Vaccinifer. I examined the vaccinifer F. J. S.—d. The vaccination marks looked in a perfectly normal and healthy condition, and the child appeared to be a generally healthy one.

Co-vaccinees. I afterwards saw Mrs. C., the mother of J. C., one of the three children vaccinated from the vaccinifer F. J. S—d. She informed me that her child was vaccinated on the 17th October and at the same time as E. S., that the matter was removed on the 24th October, and that the arm was quite normal and healthy up to the time of death, there being no inflammation, redness, or swelling of the arm, and no enlargement of the axillary glands so far as she knew. The child on the 28th October caught a severe attack of bronchitis owing to the cold weather then prevailing, and died from bronchitis on the 3rd November. I next interviewed E. H., a neighbour of Mrs. B. (the mother of the second co-vaccinee A. E. B.), who attended the child A. E. B. She informed me that the matter was removed from the child A. E. B.'s arm on the 24th October, that the arm was then normal and remained quite healthy up to the time of death, that there was no inflammation, redness, or swelling of the arm, no enlargement of the axillary glands, as far as she knew, and that the child died on the 19th November. She was from the first a weak child and suffered constantly from diarrhœa and sickness, and also occasionally had convulsions with twitching of the face-muscles and squint. The child was fed on cow's milk and water. I saw a sister of this child A. E. B. The sister was 18 months old, and was a very rickety child and also suffering from tubercular disease.

Sanitary surroundings. I lastly proceeded to make an inspection of the sanitary conditions of the cottage occupied by the parents of the deceased child E. S. I found in the back garden, and only a few feet from the house, a privy, directly underneath which and at the back of which was a large open cesspool, which was shallow (being two and a half feet deep) with walls of porous brick and mortar, the bottom being the ordinary earth. The cesspool was half full of fecal matter, urine, and rain-water, and evolved a most abominable stench, which smell could easily be carried into the cottage when the wind was in that direction. It was, moreover, situated only about six or seven feet from a shallow well supplying the cottage with water. I was informed that this cesspool was only emptied once or twice in a year.

From further inquiries that I made I could hear of no cases of erysipelas having occurred in the district, either previous to or at the time of the illness of the deceased E. S.

Conclusion. The vaccination in this case was an arm-to-arm one, the vaccinifer being apparently a fairly healthy child, and although the results of my inquiries revealed the fact that the three children vaccinated from this vaccinifer had all subsequently died, yet I am convinced, as the result of my inquiries, that the deaths of the two children J. C. and A. E. B. (the two co-vaccinees of the child E. S.) were not connected in any way with vaccination and were entirely due to extraneous causes. In my opinion the child E. S. undoubtedly died from erysipelas, which appeared about the eighth or ninth day after vaccination. The erysipelas, in my opinion, was caused by the extremely bad sanitary arrangements existing at the cottage where the child lived, and not to introduction in the vaccine lymph at the time of vaccination of the deceased, for the following reasons:—

(i.) On account of the lateness of the period at which the erysipelas was produced after vaccination:

(ii.) On account of the healthy condition of the vaccinifer; and

(iii.) On account of the fact that the other two children vaccinated from the same vaccinifer did not develop erysipelas, and that the vaccination in them pursued a normal course.

ARTHUR PEARSON LUFF, M.D.

CASE 201, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of D. A. W. Copy of two letters received by the Commission from the medical man by whom the cause of the death of D. A. W. had, it was stated, been certified.

DEAR SIR, 20th November 1892.

I NOW forward for the perusal of the Commissioners the details of the case of D. A. W., and if they are not sufficiently full, or there is any other point on which information is desired, I will do my best to supply such.

All the cases are from private practice, and, if possible, I should be glad that the details should not be appended to the full names, but initials only used. Apologising for delay,

I remain, etc.,

M. G. B.

B. Ince, Esq.

(*Enclosure.*)

D. A. W., of ——, born 20 July 1892, vaccinated October 7th. On the 8th day (15th) all seemed going on well; on the 27th was called to the house and found her feverish, with a slight red blush on arm just where one of the vaccination marks had been apparently rubbed; the other two were dry and healed. The rash spread all over the body with the exception of the head

and face; the hands and fingers were very much swollen, the forefinger of the left hand vesicating. The feet and toes were affected last of all, and, like the upper corresponding parts, were much swollen. All the rest of the body was clear, and the child appeared to be doing fairly well. On the morning of the 9th November I was called early, found the child collapsed and insensible, and death took place shortly afterwards. The temperature did not rise above 103°.

The child was small for its age, but had not been ill; at the time of the vaccination I called attention to a red dress, and told the mother to be very careful or she might find the wound poisoned, the dye having already stained some of the under white linen; it was tied back. My own opinion is that this was probably the starting point of the disease. The child was vaccinated with calf lymph from Dr. R.'s, who has supplied me for many years, as I never use any but the animal lymph, and have discarded arm-to-arm vaccination. The dates of other vaccinations near in point of time to this are September 22, 29, 30, October 1, 5, 7, 22 (2), 24, and all these children have done well.

Last July I had a similar case. The child was healthy and full sized, born on January 27, 1892, vaccinated with calf lymph from source as above on June 21st. All went on well until July 17th, when the baby was brought to my house, having a temperature of 103° and the history of a fall on its side; the vaccination wounds seemed healed, and one had apparently been rubbed, but there was no bruising nor did any occur afterwards. There was a rash round the rubbed mark, which behaved as in the above case, the illness lasting until August 24th, the child making a good recovery. During this time I had no other other cases of erysipelas, and until the fall the child had seemed to the mother to be going on well; this child lived at a laundry; the first case was a private house. In both cases it was the outside one of three marks that was rubbed, and in each case this dried up in a day or two; there was not the slightest sloughing or discoloration of the insertions.

As proving the prevalence of epidemic erysipelas, I was called on November 5 to a case of facial erysipelas; there was a small sore on systum of nose from which it apparently started. On June 14 another case occurred arising this time from right ear from which a discharge had been noticed for some days. Both cases were men. All these cases have been in the same neighbourhood; the two extremes not being more than half a mile apart.

May I be allowed to offer the following remarks:—1st the presence of injury in each case; a distinct fall in case No. 2, and the rubbing of a vesicle in No. 1 with possible poisoning from an aniline dye.

2nd. That in neither case can it have been directly due to vaccination. The period of invasion of erysipelas is usually two days to two weeks (Quain's Dictionary of Medicine). In a case of direct inoculation by Fehleisen in the gluteal region, the rash appeared on the 4th day (Heath's Dictionary of Surgery). In the second case the disease did not commence until the 26th day after vaccination and in the first case on the nineteenth. This does away with a direct infection due to vaccination. It cannot be denied that any wound may be a nidus for germs and so indirectly in each case no doubt the vaccination was the cause. In neither case was there any sloughing or discoloration of wounds.

3rd. In the first case there is at least evidence of an epidemic of erysipelas.

20th November 1892. M. G. B.

DEAR SIR, 21st November 1892.

THROUGH the courtesy of the Medical Officer of Health, I am able to forward a statement of the number of cases of erysipelas notified in my own ward during October and November—he tells me I may multiply by four to get the number in the whole parish. I think this will more than suffice to prove an epidemic.

Yours, &c.

B. Ince, Esq M. G. B.

(*Enclosure.*)

List of cases of erysipelas in No. 4 Ward notified during the months of October and November to date, 21st November 1892.

[*A list of 22 cases follows.*]

CASE 202, REPORTED TO THE COMMISSION BY THE CORONER.

Case of E. M.: report to the Commission of Dr. Theodore Dyke Acland.

E. M., aged 3 months, of ——, was vaccinated by D. A. G. W., Public Vaccinator, on the 10th October 1892. *Vaccination.*

11th November 1892. *Death.*

"Vaccination; cellulitis of arm; broncho-pneumonia." *Certified cause.*

Mr. Henry S. Wild, M.R.C.S., of St. George's Hospital. *Certified by.*

18th November 1892. *Inquest.*

"Death from natural causes." *Verdict.*

Direct from arm of L. C., of ——. *Source of lymph.*

L. C. died on the 28th November. The certified cause of death was "Bronchitis; convulsions." Certified by Mr. H. E. P., M.R.C.S., who informs me that he was not even told that the child had been vaccinated, and that he is decidedly of opinion "that vaccination in no way "accelerated the child's death." *Vaccinifer.*

Mrs. C., the mother of the vaccinifer L. C., informs me that vaccination was normal, and the arm looked well until the end of the second week, when the nightdress stuck to it and one of the scabs was in consequence torn off. She says that even after this accident the wounds did not discharge much. There was some ulceration and all the vesicles coalesced, but the wounds were well and firmly healed in less than a month; they did not break down after they were once healed. There was no rash, no enlargement of glands, nor any sign that vaccination had pursued other than a normal course, interrupted only by the injury to the vesicles at the end of the second week.

At the date of my visit, the 2nd December 1892, eight weeks after vaccination, the child was dead; but I was able to examine the arm and found one irregular scar at the point where the vaccination vesicles had coalesced. It was slightly depressed, with no surrounding induration. The body was not emaciated. I was unable to make a complete examination as the child was in its coffin and just about to be buried. The mother, however, assured me that there were no marks on the body, and that the child had been well until the bronchitis began.

L. C. was the youngest of three children. The first was illegitimate and died when aged five months. I was unable to ascertain the cause of death. The second, B. C., is alive; she is not a strong-looking child, but I was unable to detect any sign of inherited syphilitic taint. The mother has had no miscarriages. The other details of the family history are unimportant.

Taking all the circumstances into consideration, it seems probable that until the child L. C. fell ill with bronchitis she was reasonably healthy, and showed no symptom of constitutional disease, and was thus a fit case from which to take lymph for further vaccinations.

Two. *Co-vaccinees.*

B. R., of ——, No. 454 in the register. Vaccination did not pursue a normal course. The arm seemed to be doing well during the first week, inflammation then gradually spread to the elbow, and some patches of eczema formed on the head and one or two on the hands. Three of the vesicles coalesced, and the upper one at the time of my visit on the 2nd December, seven and a half weeks after vaccination, was still covered with an eczematous scab, but without induration. There is only one normal cicatrix, the others are irregular and had evidently been the seat of considerable inflammation. The child is now well and healthy looking, with a clear skin, no eruption on her body, no mucous tubercles or other evidence of syphilitic infection. B. R. is the eighth child. None have died, and the other children look well. The mother also is healthy looking; she suckled B. R. and did not subsequently suffer from sore nipples nor from eruption on the skin.

A. L., of ——, No. 455 in the register. Vaccination pursued an abnormal course. The arm is said by the mother to have been rubbed before the eighth day, and certainly by the eighth day the vesicles were broken and discharging so that no lymph was taken from them. Mrs. L., the mother of A. L., says that there was not much inflammation round the vaccination wounds, but there was some swelling of the axillary glands and patches of eczema appeared on the head. When I saw the child on the 2nd December the arm was not well healed and there was an irregular crust over the two lower scars. There was

no induration round the vaccination wounds, no enlargement of glands, and no eruption upon the body. The child is delicate and had always been in feeble health. He is the youngest of eight children, seven of whom are living; one has died of whooping-cough.

Sub-vaccinees. None.

Course of vaccination and illness. According to Mrs. M.'s account, her child E.M. was well up to the time of vaccination. It was vaccinated in four places, and Mrs. M. was requested to bring the child for inspection on the following Monday, but as the vesicles were not properly formed she did not think it necessary to go. She however took the child for inspection on the following Monday as Dr. A. G. W., noting her absence, had sent a postcard to the Vaccination Officer requesting her attendance. Mrs. M. states that the arm at this time was very much inflamed, and that, as far as she knows, the inflammation was not due to any mechanical injury to the scabs. Dr. A. G. W. prescribed such treatment as he thought necessary. Mrs. M. applied the ointment ordered (she says that it was zinc ointment) for one week, and then as the inflammation did not subside she took the child to Dr. B., under whose care she continued until admitted to St. George's Hospital, on the 31st October, under the care of Mr. Rouse.

When admitted to St. George's Hospital the following notes were made by Mr. H. Allingham, F.R.C.S., surgical registrar :—

"*On admission.* Child looks ill. *Left arm* about "shoulder are four vaccination marks, and an ulcer, all "gangrenous and sloughing. Skin around very red and "hard, &c. *Head.* There is a hard tender swelling about "the back of the occiput on the left side.

"*Nov. 3rd.* The arm does not seem to have improved "at all. It is dressed with Lot. plumbi c. opio.

"*Nov. 4th.* On Nov. 4th temperature went to 101·6. "The child began to cough. Steam tent put up.

"*Nov. 9th.* Temperature went up to 103. To-day "the cough seems easier. The slough now very loose; "and nearly coming away. The child is very ill and weak. "Takes food well.

"*Nov. 11th.* Child's temperature went up to 104·2, "and child died gradually getting weaker.

"Child was vaccinated about a month ago, after the "spots became gangrenous and ever since the gangrenous "areas have spread."

Mr. Wild, M.R.C.S., house surgeon of St. George's Hospital, gave evidence at the inquest corroborating the notes given above. He said that on the left arm over the deltoid were four gangrenous patches about the size of a shilling, almost separated by sloughing. The arm was inflamed and hard. On the 5th November, up to which time the temperature had been nearly normal, the child began to cough and was found to be suffering from bronchopneumonia. This did not show any sign of improvement up to the day of her death, on the 11th November, but the condition of the arm slightly improved.

Pedigree of lymph. Considering the nature of the injury which followed vaccination in the case of the child E. M., I have thought it desirable to trace the lymph backwards through the various vaccinifers for a considerable number of weeks, so that in case there was any evidence of syphilitic infection or syphilitic inheritance in any one of them, traces of the infection might be discovered. With the help of Dr. A. G. W. I have, therefore, seen all the vaccinifers in the direct line as far back as the 1st August. After so long a time (about 18 weeks previous to my investigation) any evidence of infected or inherited disease would, in all probability, have shown itself. The children from whom the lymph was derived were as follows:—

H. W., of ——, No. 397 in the register. Vaccinated 26th September. Vaccinifer to L. C. H. W. is the second child. There have been no others, and the mother has had no miscarriages. The child when I saw him was healthy and well. He has three normal scars. There had been no eruption, no discharge from the wound, and vaccination pursued a normal course.

A. M., of ——, No. 388 in the register. Vaccinated 19th September. Vaccinifer to H. W. A. M is the ninth child. All the others are living and well. Vaccination pursued a normal course. The wounds were quite healed in three weeks and have not subsequently broken down. The child is well.

W. L., of ——, No. 369 in the register. Vaccinated 12th September. Vaccinifer to A. M. W. L. is the fifth child. Vaccination pursued a normal course with the exception of some slight ulceration of the vesicles in consequence of which healing was delayed, but the arm was entirely well in a month, and the wounds have not subsequently broken down. There had been no rash nor eruption of any kind. There are four normal but slightly irregular scars. The child when I saw it was suffering from bronchial catarrh.

F. C., of ——, No. 358 in the register. Vaccinated 5th September. Vaccinifer to W. L. Vaccination pursued a normal course, and at the time of my visit the child was well. There had been no eruption and no induration of glands. There are four normal scars.

F. B., of ——, No. 343 in the register. Vaccinated 29th August. Vaccinifer to F. C. F. B. is the seventh child. Six are living, one has died of bronchitis. One suffers slightly from impetigo. Vaccination was normal, and there are four normal scars. The child when seen was in excellent health.

L. G., of ——, No. 327 in the register. Vaccinated 22nd August. Vaccinifer to F. B. L. G. is the third child. None of the family have died. The mother miscarried her first pregnancy. Vaccination was normal, and the arm was well in three weeks. There are four normal scars. The child is well.

L. T., of ——, No. 285 in the register. Vaccinated 15th August. Vaccinifer to L. G. L. T. is the third child. Two children have died. The mother believes of tubercular disease; one of disease of the lungs, and the other of meningitis. Mrs. T. was very uncertain as to dates, but she stated that the vaccination wounds did not heal very readily. She says that no ulcers formed upon the arm, but that there was some rash upon the child's body after vaccination. The date of its appearance and its nature are quite uncertain. Mrs. T. says "it came and went," and caused a good deal of irritation. It was probably eczema. The child when I saw her looked well. There are four normal scars.

A. C., of ——, No. 273 in the register. Vaccinated 8th August. Vaccinifer to L. T. Vaccination normal. There are four healthy scars. The child appeared well nourished and in excellent health.

H. S., of ——, No. 255 in the register. Vaccinated 1st August. Vaccinifer to A. C. According to the mother vaccination would have been normal, but that the scabs were knocked off three or four times. Notwithstanding this, the arm was quite healed in a month. During the first week there was some vesicular rash upon the body, which soon disappeared. The child is well. There are four normal cicatrices.

Summary of the above. From the foregoing, it will be seen that vaccination in the direct line pursued a normal course in every case except those of Nos. 285 and 255 in the register. The slight departure from the normal in the latter case is traceable to injury to the scabs, and in the former (No. 285) there is no evidence to lead to the belief that the eruption which appeared after vaccination was of a specific nature. The early appearance of the rash, the way in which it disappeared and broke out again, and the irritation that it caused, are all opposed to such a conclusion. There is, therefore, practically no evidence to show that any syphilitic infection through vaccination was received or conveyed by any of the children inoculated in the direct line for more than two months previous to E. M.'s vaccination.

Family history. Mr. Wild stated at the inquest that Mrs. M., the mother of E. M., had informed him that she had suffered from syphilis, and that one of her children had shown signs of congenital syphilis before it died. Mrs. M. has perforation of the palate which causes a difficulty in speaking. Mr. M., who is her second husband, and has been married to her for three and a half years, admitted the accuracy of these statements, and was well aware that previous to marriage she had suffered from syphilis.

Neither Mr. Rouse nor Mr. Wild were of opinion that the child E. M. showed distinct evidence of congenital syphilis, although whilst in the hospital a rash had appeared on the child's hands and feet, lasting for two days, which was thought to be possibly but not certainly syphilitic.

Post-mortem examination. The post-mortem examination was made by Dr. H. Rolleston, Pathologist to St. George's Hospital. He made the following notes:—"P. M. 317. E. M., 4½ months.

" Under Mr. Rouse. Admitted October 31st. Died " November 11th, 1892. Time after death 27 hours. " Rigor mortis present. Red eruption on bottom and " vulva. Length, 19 inches.

" Dry black sloughs over upper part of left arm forming " a deeply ulcerated area 2×1½ inches over the head of " the humerus. There is suppuration spreading up to- " wards the clavicle. Left shoulder joint is normal. " Humerus is quite healthy.

" *Head.* Bones, membranes and sinuses normal. Brain " 16 oz. normal. Cord not examined.

" *Thorax.* Pleurae normal. *Lungs*, R. 2 oz., L. 2½ oz. " Do not collapse on removal of the sternum. Bronchi " contain thick mucus. Considerable collapse of both " bases posteriorly and of the left upper lobe. General " early broncho-pneumonia, more marked in left lung.

" *Bronchial* glands and *thyroid* body normal.

" *Pericardium* normal. Heart 1 oz., normal.

" *Abdomen. Liver*, 6 oz., normal. Bile ducts pervious. " Spleen, Pancreas and Suprarenals healthy. *Kidney.* " R. ¾oz., L. ¾ oz. Bladder, genitals, intestines, and " stomach normal. (Bones, joints, feet, and hands normal, " but not recorded.)"

Dr. Rolleston further stated at the inquest that after death he noticed an eruption upon the buttocks which he did not think was syphilitic, that he saw no eruption on the hands and feet, and that on the upper and outer part of the arm was an area of about the diameter of a five shilling piece which was gangrenous, the destructive process involving the muscles and reaching to the bone, the suppuration spreading up towards the clavicle. He did not consider from the examination which he made of the internal organs that there was evidence of the child being the subject of congenital syphilis. The tissues of the arm, he said, had sloughed and bore very little resemblance to a vaccination sore; but inasmuch as vaccination had caused the wound it enabled an external poison to get in. As far as he was able to judge the sore was not in any way syphilitic. He stated that he "believed the immediate " cause of death to be lung affection," and that the broncho-pneumonia was not of a septic character. He added that in his opinion the slough on the arm predisposed the child to bear badly any illness, and that he believed it did accelerate her death.

On the 18th and 19th November I examined the arm, but the child had then been eight days dead, and doubtless the appearances were much altered by post-mortem change. There were then three black sloughs on the upper and outer part of the arm, evidently the seat of the vaccinal inoculation, and forming together an area 2 inches long by 1¾ broad. The upper and outer slough had almost separated. Around the slough there was a zone of skin, about an eighth of an inch wide at the top and half an inch wide at the bottom, partially destroyed by the inflammation. The lower part of the deltoid at its insertion was laid bare, and the soft parts were exposed as far as the humerus, which was visible. Dr. Rolleston informed me on inquiry that he laid bare the humerus in the course of his examination, although he has no doubt that the gangrene extended to it.

thod of cina- n.

Dr. A. G. W. appears to be very particular about the method in which he conducts his vaccinations. His register was, as far as I could judge, well and correctly kept, and his instruments in proper order. I have found no reason to suspect that the result of the vaccination in the case of E. M. was due to any carelessness on his part, or to his having through carelessness chosen an improper child as vaccinifer. He seemed to take every precaution which ordinary foresight could suggest.

nclusion.

Consideration of the above facts show that the strain of lymph used in these vaccinations produced normal results until L. C. was vaccinated on the 13th October L.C. was the vaccinifer for three cases, B. R., A. L., and E. M. Of these B. R. and A. L. suffered from abnormal inflammation, and E. M. is the subject of this report. It would thus appear that lymph derived from the child L. C. was capable of exciting an unusual amount of inflammation. In the case of B. R. and A. L. it produced no worse result, but in the case of E. M., whose family history was bad, the inflammation set up was so intense as to destroy the vitality of the tissues and to cause gangrene.

There is no evidence to show that the lymph contained the virus of syphilis, and that this was a case of syphilitic phagedaena, but on the other hand the fact cannot be disregarded that Mrs. M., the child's mother, had suffered severely from syphilis, and that one of he children had died with symptoms referable to inherited taint.

I append a copy of the depositions taken at the inquest.

THEODORE DYKE ACLAND, M.D.

(Copy of depositions taken at Inquest.)

Informations of Witnesses taken and acknowledged on behalf of Our Sovereign Lady the Queen touching the death of E. M. at ——, on Friday, the eighteenth day of November, One thousand eight hundred and ninety-two, before J. T., Esq., Her Majesty's Coroner for ——, on view of the Body of the said Person then and there lying dead as follows:—

J. M. sworn saith:—

I live at ——. I am a labourer. The deceased is my daughter E. M. She was born on the 4th August last. I have one child alive. I have now lost two children. The other died in a convulsion. I saw the child at home for about a fortnight when its arm was bad. Before it was vaccinated it was healthy. I do not think any doctor saw it before. I made no objection to the vaccination. I am the second husband. I was married to my wife three years ago.

E. M. sworn saith:—

I am the mother of the child. The child was healthy at birth. It had no illness up to the time of vaccination. I took it to be vaccinated on October 25th last at Dr. A. G. W.'s at ——. It was about 1 o'clock. I held the child. It was vaccinated in four places. I said nothing at all to the doctor, he did not examine the child that I saw. He told me to come on the following Monday. I did not go, because there was nothing hardly on the child's arm to be seen. On the following Monday I took her to Dr. A. G. W. because her arm was inflamed and so bad. I had put nothing at all on the arm. The arm was not rubbed. Dr. A. G. W. told me to get some zinc ointment on it. I got some zinc ointment from a chemist's shop in ——. I put it on that week. I was not satisfied with that and I took her to Dr. B. He gave me a lotion. I used it all on the arm. On the Sunday before she was taken into the hospital I was advised to take her to the hospital. I did so on Monday, St. George's Hospital. She remained there to her death on the 11th inst. I did not tell the Coroner's Officer, Dr. A. G. W. recommended carbolic ointment.

Henry Sidney Wild sworn saith:—

I am House Surgeon at St. George's Hospital. I first saw the child on October 31st at the hospital. I examined her then. She looked pale and unwell. On the left arm over the deltoid were gangrenous patches about the size of a shilling piece each. They were being separated by sloughing. The arm was inflamed and hard. She was admitted. The child was otherwise healthy. There was no cough or cold. She was from that date suffering from bronchial pneumonia. The condition of the lungs did not improve. She died on November 11th, the condition of the arm had improved by that time. The temperature was nearly normal until November 5th, then it rose. The sores were different from ordinary vaccination sores. The pieces of tissue were dead. The sloughing was also abnormal.

I have examined the mother. She told me that 7 or 10 years ago she suffered from syphilis. She told me she had one child that had congenital syphilis. She told me that when the child was in the hospital. The mother has a cleft palate, probably from syphilis. I cannot give her exact words. After the child had been in hospital two days I noticed a rash on feet and on the hands. There was nothing characteristic about the sores themselves.

Humphrey Davy Rollestone sworn saith:—

I am M.D., Camb., and pathologist at St. George's Hospital. I made a post-mortem examination of the body last Saturday. There was an eruption on the buttocks, not syphilitic. I did not notice anything on the arms, hands, or soles of feet. I did not notice any swelling on lower part of left arm, on the upper part and outer aspect there was an area rather larger than a 5*s.* piece from which the tissues had sloughed (gangrenous), this passed through the

muscle down to the bone of the arm, spreading up towards the collar bone there was suppuration and evidence of cellulitis. The bone of the arm at shoulder was quite healthy. The child had inflammation of the lung (broncho pneumonia) not of a very severe character. The other organs were all examined and were healthy. There was no internal sign of the child being subject of congenital syphilis. The immediate cause of death was the lung affection. The bronchial pneumonia was probably after the sore on the arm. The large sloughing area on the arm predisposed the child to suffer severely from any illness. The presence of the sore in my opinion accelerated the death. There was very little resemblance between that sore and the vaccination sores usually seen. The vaccination produced a wound and allowed poison to get in. I think it was not due to any form of syphilis. I think the child was not syphilitic. I do not think ointment would prejudice the vaccination. There is no ground to suggest the sore was syphilitic.

A. G. W. sworn saith:—

I am a Public Vaccinator for ——. I made an entry of vaccination E. M. of —— on 10th October. I do not remember doing it. I have a mark to show the child was not produced on the Monday following. I gave the Officer notice of this. The child was produced for inspection on October 24th. I don't remember that. The child was vaccinated from No. 432 in my register. I had reason to believe it was good. The children vaccinated from the same lymph are doing well. There are two in number. I saw them last evening.

Case 203, reported to the Commission by the Local Government Board.

Case of F. E. H.: report to the Commission of Dr. Arthur Pearson Luff.

In November 1892 I was requested by the Commission to investigate the circumstances attending the death of F. E. H., late of ——, and the alleged connexion of the death with vaccination.

The entry in the register of the death of the child was to the effect that F. E. H., aged two months, died on the 11th November 1892, the cause of death being certified by Dr. T. E. C., of ——, as "erysipelas, fifteen days; vaccination, thirty days."

Dr. T. E. C., who is a Public Vaccinator, and who had himself vaccinated the child F. E. H., subsequently wrote with reference to the case to the effect that the deceased was vaccinated on the 11th October 1892, from the arm of another child, and when inspected on the 18th October (seven days after vaccination) the arm showed four vesicles, healthy in appearance, with areola, and the child then seemed quite well. No lymph was taken from the arm because there were no children requiring vaccination at the time. On the 29th October (18 days after vaccination) the father of the child came and stated that she was feverish, and on the following day Dr. T. E. C. saw the child and found that the vaccinated arm was slightly swollen with an erysipelatous blush upon it, and, to a slight extent, on the left side of the body. The temperature was raised, the vesicles on the arm were nearly healed, and there was a dry scab on one vesicle; the diagnosis was erysipelas; he was unable to trace the source of the erysipelas. The child gradually got worse, and died on the 11th November, one month after vaccination.

I have been to ——, where I first interviewed the mother of the deceased, who informed me that the child went on quite well until the 15th day after vaccination, when she noticed that she was feverish and out of sorts, and on the following day, 16 days after vaccination, she first noticed a redness above the arm around the vaccination marks, which inflammatory redness spread down the arm to the fingers, and, later on, invaded the chest, back, opposite arm, abdomen, and finally the legs. The vaccination marks were not discharging previous to the attack of erysipelas, and she did not prick or apply anything to the places; she had taken the child to —— in cold weather several times during the fortnight succeeding the vaccination.

Sanitary surroundings.

I inspected the sanitary arrangements of the cottage, and found them to be in a good condition; the privy was provided with a pail worked on the earth system, which was emptied once or twice every week, and the privy was some distance from the cottage; there was not anything in connexion with the sanitary arrangements which appeared likely to have been the cause of the erysipelas.

Vaccinifer and co-vaccinee.

I ascertained from Dr. T. E. C. that the child was vaccinated from E. A. B., of ——, and that from this vaccinifer there was vaccinated, at the same time, one other child, J. B., of ——. I visited and saw the vaccinifer and J. B., and found them both to be healthy children in whom the vaccination had run perfectly normal and natural courses.

At the same time that the deceased child F. E. H. was attacked with erysipelas there was no other case of erysipelas that was known in the village.

Conclusion.

The deceased evidently died of erysipelas contracted about 16 days after vaccination. I was unable to ascertain the source of infection, but in my opinion it could not have been due to inoculation with erysipelas poison at the time of vaccination and contained in the vaccine virus for the following reasons:—

(i.) The erysipelas did not appear until the 16th day after vaccination.

(ii.) The vaccinifer had never had erysipelas and was a healthy child whose vaccination ran a normal course; and

(iii.) The other child vaccinated from the same vaccinifer, at the same time as the deceased, remained quite healthy and his vaccination ran a normal course.

Arthur Pearson Luff, M.D.

Case 204, reported to the Commission by the Coroner.

Case of M. E. F. H.: report to the Commission of Dr. Arthur Pearson Luff.

On the 26th November 1892, at the request of the Commission I proceeded to ——, and there attended the adjourned Coroner's inquest concerning the death of M. E. F. H., aged one year and 10 months, who died on the 13th November. A communication had previously been received by the Commission from the Coroner to the effect that he had opened an inquest on the body of the deceased, who appeared to have died from blood-poisoning three weeks after vaccination, and that the inquiry had been adjourned by him to allow a post-mortem examination and further investigation.

On the 16th November at the opening of the inquest, the evidence of Mrs. E. H., of ——, the grandmother of the deceased child M. E. F. H., was to the effect that the child was one year and ten months old. She was a full term child, but had always been delicate, and was vaccinated by Dr. J. C. only between three and four weeks ago, *i.e.*, when aged one year and nine months. The child was less lively after vaccination, and gradually acquired a bad arm. On the 12th November she seemed poorly, and on the following day she was worse, convulsions came on, and Mrs. E. H. called in Dr. W. J. F. The death occurred at 6 p.m. on that day. The vaccination was done from a glass tube.

The evidence of Mrs. L. H., of ——, the mother of the child, was to the effect that the deceased was cutting some back teeth at the time of vaccination, but was not suffering from diarrhœa or sickness. In her opinion the vaccination did not take well. During the first week nothing unusual happened, but some days later the arm inflamed and two of the vaccinated places burst and joined together. Two days previous to death the inflammation seemed to subside and the arm appeared to be doing well in her opinion.

The evidence of Dr. W. J. F., of ——, was to the effect, that on the 13th November he was called to see the deceased. The child was then in a semi-comatose condition, jaundiced, and collapsed. Temperature 104 degrees. On the left arm was an ulcer 1¼ inches long and ¾ inch wide, which was in an unhealthy condition, but was not discharging. In his opinion death was due to acute septicæmia, owing to absorption of septic matter from the vaccination wound.

At the adjourned inquest on the 26th November, Dr. W. J. F., re-called, stated that the grandmother of the child was suffering from cancer of the left breast, which was in an

ulcerated and discharging condition; and he thought it both possible and probable that such a wound could be a source of infection to the child's wound on the arm. During the nursing of the child by the grandmother and the dressing of the child's arm, it was possible for the grandmother to convey by her fingers septic matter from her breast-wound to the wound on the child's arm.

The evidence of Mr. A. J. Pepper, F.R.C.S. and Surgeon to St. Mary's Hospital, was to the effect that he had made a post-mortem examination of the deceased on the 20th November, in the presence of Drs. W. J. F. and J. C. The body was well nourished; there were no signs of post-mortem decomposition, and no marks of violence. The only abnormal appearance on the body was on the upper part of the left arm, where there was a deep indolent ulcer in the situation of the vaccination area. It was somewhat dumb-bell in shape, as if two vaccination sores had run together. There was clear indication of inflammation about the ulcer at the time of death. There were no signs of healing of the ulcer. The axillary glands were much enlarged and congested. Except at the sore there was no suppuration elsewhere. The liver was much enlarged. The spleen was very much enlarged indeed, and softer than normal. The cortex of the kidneys was swollen, pale, and softer than normal. There was no enlargement of the mesenteric glands. The lungs were healthy, with the exception of slight congestion at the bases, and the heart was healthy. There was no appearance of struma, and the joints were in a healthy condition. Death, in his opinion, was due to absorption of septic matter from the sore on the arm. This was indicated by the sore, by the enlarged glands in the axilla, and by the condition of the spleen. In his opinion, it was quite clear that the septic matter was not introduced in the lymph employed for vaccination, as if such had been the case, septicæmia would have set in much sooner (probably in about 24 hours) after vaccination, whereas the child died three weeks after vaccination. Defective sanitation, or rubbing the arm with dirty matter, would conduce to septicæmia, and any wound so infected might produce a septicæmic condition.

In reply to a question put by Mr. C. G., Mr. Pepper said that if septic matter were introduced at the time of vaccination, he would expect symptoms of septicæmia within 24 hours. Vaccination in every case sets up some fever and weakens the child, and in some cases produces more fever than in others. He thought it within the bounds of possibility, but not of probability, that calf lymph might produce sufficient disturbance to cause death.

In answer to a question put by me, Mr. Pepper stated that he could not have detected at the post-mortem examination any poison or poisons to which the septicæmia or blood-poisoning could be traced.

The evidence of Dr. J. C., of ——, was to the effect that the child had previous to vaccination been in feeble health for some time; and he stated that vaccination had been postponed on that account. He considered the child quite well enough to be vaccinated when brought to him on the 21st October. He vaccinated the deceased on the 21st October in two places, using calf lymph and a clean needle-point supplied with the lymph, which lymph he obtained from an establishment in ——. He vaccinated another child at the same time, with the same instrument and lymph, and that child was quite well now, and had had no bad symptoms. He saw deceased for the second time, on the 28th October, seven days after vaccination; there were then normal vesicles on the left arm, and no more inflammation than was natural to the period. There was no sign of an ulcer when he saw it on that day. He did not see the child again. He always used calf-lymph for vaccination purposes, and in his experience it had never produced greater inflammation than other lymph. He vaccinated the child at his house, and he was not a Public Vaccinator.

Mrs. L. H., the mother of the deceased child M. E. H. F., recalled, stated that she dressed the wound on the child's arm with clean dry rag which she changed three or four times a day. After the 3rd November there was considerable discharge from the ulcer on the arm, which discharge was offensive in smell and stained the rags considerably.

Mrs. E. H., the grandmother of the deceased, recalled, in reply to Mr. C. G., stated that the cancerous wound upon her breast was discharging between the 21st October and the death of the child. She did not think she had conveyed anything from the wound upon her breast to the child's wound.

Replying to questions put by me, she stated that there was a good deal of discharge from her own wound, that the discharge was offensive at times, and that she dressed the wound two or three times a day, and sometimes more frequently. She thought that she had taken all care to cleanse her hands after dressing the wound on her breast. She had frequently changed the rag on the child's arm herself.

Verdict of Coroner's jury.

The deceased died from blood-poisoning, following absorption of poisonous matter from the vaccination wound, but there was no evidence to show the nature of that poison. A rider was added to the verdict, blaming the mother and the grandmother of the child for treating the wound as they did, and for not calling in a doctor sooner.

Conclusion.

In this case the lymph employed was calf-lymph, and as another child was vaccinated with the contents of the same tube, and as the latter infant did perfectly well, the death of the deceased must have been due, either to purely personal conditions of health, or to some extraneous cause, other than vaccine lymph. Moreover, that the septicæmia did not result from poison introduced at the time of vaccination is indicated by the fact that, at the end of the week after vaccination, the medical man who vaccinated the child examined the arm, and certified the case as successful; and it was not till some days after this that the wound became inflamed, and the two vaccination areas became confluent.

It is evident that death was due to septicæmia from absorption of septic material from the wound. The septic matter may doubtless have been introduced from without, on account of the neglect of antiseptic treatment of the wound. The neglect of the proper treatment of the wound, by the relatives of the child, was obviously due to ignorance on their part.

ARTHUR PEARSON LUFF, M.D.

CASE 205, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of H. B.: report to the Commission of Dr. Arthur Pearson Luff.

In January 1893 I was requested by the Commission to investigate the circumstances attending the death of H. B., late of ——, and the alleged connexion of the death with vaccination.

The entry in the register of the death of the child was to the effect that H. B., aged four months, died on the 26th November 1892, the cause of death being certified by Dr. A. P., of ——, as "vaccination, one month; marasmus, one month."

Vaccinifer and co-vaccinees.

On making inquiry, Dr. L., Public Vaccinator for the district, informed me that the child H. B. was brought to him on the 25th October 1892, at his station in ——, where he was vaccinated with lymph taken from the arm of a child named R., of ——. I have seen this child, who is quite healthy and has good vaccination marks. Six other children were vaccinated from the same source at the same time as H. B., and all did well. Of these six, I have only been able to trace three, the others having left the neighbourhood, viz., A. C., of ——, L. P., of ——, and J. H., of ——. All these children had good cicatrices, were healthy, and in each of them the vaccination had run a normal course, without any complication.

Sanitary surroundings.

On visiting Mrs. B., the mother of the deceased child H. B., I found the house in which she was living in a very dirty and unsanitary condition. She stated that she had had six children, three of whom had died, one of convulsions, one of tubercular brain disease, and the one concerning whose death the inquiry was being made. She stated that the deceased had never been a strong child, and that the vaccination had not been attended by any complication. The three living children are all delicate, one being very thin and strumous, and the youngest, aged four years, being very rickety, with large joints and head, tibia curved, and appearance generally indicative of malnutrition.

Conclusion.

Dr. A. P. informed me that he only saw the deceased child once, and that "he has no ground whatever for attributing "the death in any way to the operation of vaccination." In my opinion the marasmus from which the child died was congenital, and was not connected with vaccination.

ARTHUR PEARSON LUFF, M.D.

Case 206, reported to the Commission by the Local Government Board.

Case of A. D.: report to the Commission of Dr. Arthur Pearson Luff.

On the 9th December 1892, at the request of the Commission, I proceeded to ——. A letter, dated the 2nd December 1892, had been received by the Local Government Board from Dr. W. L., Public Vaccinator for the —— district, to the effect that an infant, whom he had vaccinated on the 15th October last at —— had since suffered from general cellulitis with sloughing on the dorsums of the feet, and several abscesses, accompanied with bronchitis, and that he did not expect her to recover. He stated that he had never before seen such a case, and that two other infants vaccinated from the same subject had nothing amiss with them, and that an infant vaccinated from the affected child referred to, was, as far as he knew, well.

On the 9th December, when I reached ——, I found the child referred to, A. D., aged four months (the child of W. D., of ——), still alive, and I made a careful examination and a thorough inquiry into the history and surroundings of the case and an inspection of the sanitary condition of the cottage in which the parents of the child live.

The infant A. D. (who has since died, viz., on the day following, the 10th December) was vaccinated on the 15th October when two months old. She was vaccinated from a child, R. M. L., aged six months. At the same time three other children were vaccinated from the same source.

The vaccination of A. D. took well, and ran an ordinary course at first. It was taken to Dr. W. L. on the seventh day after vaccination, when he entered it in his book as a successful vaccination, and at the same time vaccinated from it a child, A. B. W., aged eight months. A week later, *i.e.*, 14 days after vaccination, the child began to appear ill; the vaccination spots assumed an unhealthy appearance, and began to run together. The child was seen shortly after this by Dr. W. L., but in spite of treatment she gradually grew worse, and abscesses began to form at different parts of the extremities, followed in some places by sloughing. About 14 days previous to my seeing the child, bronchitis and catarrhal pneumonia had set in. The child when seen by me on the 9th December was in a very emaciated condition, and presented the appearance of a child suffering from pyæmia. On the left arm in the vaccination area was a large sloughing wound produced by the confluence of the four vaccination marks: it was somewhat larger than a five shilling piece, extending down to the muscles of the arm, and discharging a copious amount of thin stinking pus. The wound showed no signs whatever of healing. There were abscesses situated at different parts of the body. At he left elbow was an abscess containing probably about half an ounce of pus. On the back of the left hand was an abscess containing probably about two drachms of pus. At the back of the right elbow was a large abscess containing probably from an ounce to an ounce and a half of pus, and at the back of the right hand there was also a small abscess. On both the lower extremities from the knees to the ankles there were large abscesses which had been opened and which were discharging a large quantity of pus. The abscess on the right leg, when opened, contained between two and three ounces of pus. On the dorsal aspects of both feet there had been abscesses, which had been opened and had been followed by sloughing or gangrene of the skin, so that the tendons on the front of both feet were laid bare, and thin stinking pus was then discharging. The glands in both axillæ in the neck and in the groins were enlarged and soft. In addition to the general pyæmic condition of the infant, the child was obviously suffering from grave lung trouble, and appeared to me to be in a moribund condition. The mother informed me that the child was originally a healthy one and perfectly well until 14 days after vaccination, when the vaccination spots on the left arm appeared, according to her statement, to go wrong, and the symptoms and condition described above gradually supervened. The child had been fed at the breast until quite recently; she also had some cow's milk, but latterly had been unable to take much nourishment.

Sanitary surroundings.

I next made a careful inspection of the sanitary condition of the cottage in which the child lived. The rooms were low and badly ventilated, and the principal room of the cottage opened into a scullery, the door of which opened into the back garden. About 3 feet from the door of the scullery was a grated opening of a drain which led to a pipe drain, and was employed for removing slops and surface water. This pipe drain led into settling pits of the sewage works situated about 100 yards in the rear of the cottage, and, as far as I could discover, led straight to the settling pits without the intervention of a trap. The mother of the child informed me that it was a common occurrence for a bad smell of sewer gas to come from this drain and to get inside the cottage, and at the time that I examined it there was a distinct smell of sewer gas issuing from the drain. The privy was some little distance from the cottage, and was in a fairly cleanly condition, and emitted but very little smell.

Co-vaccinees. From R. M. L. there were vaccinated by Dr. W. L. the following four children, all of whom I have seen and carefully examined, viz.:—

(i.) A. D., vaccinated on the 15th October, when two months old. This is the child the subject of this report.

(ii.) J. E., vaccinated on the 15th October, when seven months old. This child is in a perfectly healthy condition, the vaccination marks are healed and normal in appearance.

(iii.) J. A. D., vaccinated on the 15th October when seven months old. This child is in a perfectly healthy condition; the vaccination marks are healed and normal in appearance. This child is cousin to A. D.

(iv.) M. B., vaccinated on the 22nd October, when five months old, from a tube containing lymph removed from the vaccinifer, R. M. L. This child is in a perfectly healthy condition; the vaccination marks are healed and normal in appearance.

Vaccinifer. I examined the vaccinifer R. M. L., and found her in a perfectly healthy condition; the vaccination marks being healed and normal in appearance.

Sub-vaccinee. On the 22nd October Dr. W. L. vaccinated A. B. W., aged eight months, from the child A. D., the subject of this report. The vaccination was a successful one, and pursued a perfectly normal course. This child A. B. W. I have seen and thoroughly examined. She is in a healthy condition; the vaccination marks are healthy and present a perfectly normal appearance.

From inquiries that I made at —— there have been no cases of disease of a septic nature that I could learn of for some years past.

On the 11th December I heard from Dr. W. L. that the child A. D. had died on the 10th December, that the parents had refused permission for a post-mortem examination, and that he had certified the cause of death as due to "catarrhal pneumonia, fourteen days, and abscesses of "skin post vaccinia, one month and seven days."

Conclusion. In this case, the illness of the child A. D. commenced 14 days after vaccination, the illness being pyæmia, which apparently resulted from absorption from the suppurating and septic sores produced by the confluence of the vaccination wounds. I am of opinion that the pyæmia was not communicated by and at the time of vaccination for the following reasons:—

(i.) The vaccinifer was in a healthy condition previous to vaccination, at the time of the removal of the lymph, and subsequently.

(ii.) The three other children vaccinated from the same vaccinifer all remained well, and in them the vaccination pursued a perfectly normal course.

(iii.) A child was vaccinated from A. D. on the seventh day after vaccination, and this child remained well and her vaccination pursued a perfectly normal course.

(iv.) The illness of A. D. did not commence till 14 days after vaccination.

From the fact that sewer gas from the settling pits of the sewage works had an easy means of entry into the cottage where the child lived, and from the fact that it did so enter, I am of opinion that the vaccination wounds were poisoned from this source, and that pyæmia resulted from absorption from the poisoned and suppurating wounds.

Arthur Pearson Luff, M.D.

CASE 207, REPORTED TO THE COMMISSION BY THE CORONER.

Case of H. C.: report to the Commission of Dr. Theodore Dyke Acland.

H. C., born on the 12th October 1892, of ——, was vaccinated in the —— Workhouse by Dr. F. W. A., of ——, the Medical Officer, on the 19th October 1892.

3rd December 1892.

"Exhaustion following a large sloughing wound after "vaccination in a case of syphilis, probably congenital."

Mr. Andrew Clark, F.R.C.S.

9th December 1892.

"Death from exhaustion following sloughing," with a rider, "that vaccination was properly performed, and the "child properly attended to by the mother and all con-"cerned."

The lymph was purchased by Dr. F. W. A. from the General Apothecaries' Company, 49, Berners Street, and was said to be Pissin's calf lymph, obtained from Germany.

The only question which may reasonably be raised about the lymph seems to be the possibility that the tube which was used was not one supplied by Dr. Pissin, through his London agent Mr. F. J. Rebman and the General Apothecaries' Company, to Dr. F. W. A., but that it was derived from some other source. There is, however, no evidence to support such an hypothesis. In this connexion I have received the following letters, the first from the Secretary of the General Apothecaries' Company and the second from Mr. Rebman, Dr. Pissin's London agent:

49, Berners Street, W.
February 2nd, 1893.

DEAR SIR,

IN reply to your favour of the 31st ulto., the lymph supplied by this Company to Dr. F. W. A., on both the occasions mentioned, was Dr. Pissin's calf lymph. We understand that this lymph is used throughout the German army, and in most of the State Departments in Berlin. We obtain the lymph through the London agent, Mr. F. J. Rebman, 40, Berners Street, W., and we supply the same exactly as received from him.

For further information permit me to refer you to the pamphlets enclosed herewith.

I am, etc.,
W. F. FOGARTY,
Managing Secretary.

40, Berners Street, W.
March 7th, 1893.

In re Dr. Pissin's Pure Calf Lymph.

DEAR SIR,

I TAKE occasion to shortly state here the source from which the lymph sold as "Dr. Pissin's Emulsified" is taken.

Dr. Pissin's Institute for the cultivation of calf lymph was established in Berlin in 1865, it being the first of its kind in the German realm. The original pock from which the virus for cultivation was taken was found on a heifer where nature had produced it. Humanised lymph has never been employed in the cultivation of this preparation, nor is humanised lymph sold on the premises either in Berlin or here.

The lymph is drawn into the little glass tubes by capillary attraction and immediately sealed in the spirit flame. Although the Emulsified preparation will keep active for a period of 6 to 12 months in an ordinary temperature, yet we are always anxious to use only the fresh supplies which are drawn at intervals of from two to four weeks according to demand.

The emulsified lymph is used by the German War Department in the army, and very largely employed in private practice. (Perhaps it may interest you to know that according to the very latest statistics only 10 per cent. of all vaccinations and re-vaccinations in Germany are made from arm-to-arm or with the humanised product; the other 90 per cent. are made with *pure* calf lymph or *retro*-vaccine.)

The lymph is emulsified with *pure glycerine*, as the German Government does not allow of any other admixtures.

I cannot here enter upon any other points regarding vaccines, for fear of trespassing on your valuable time.

So far as the case in question is concerned, I have no guarantee that the doctor who made the vaccination really employed Dr. Pissin's lymph since the General Apothecaries' Company sell Renner's, Warlomont's, Pissin's, and humanised products. A mistake might easily occur, and one kind sold for the other.

With many thanks for your kindness to me, allow me to sign myself

Yours, etc.,
F. J. REBMAN.

Co-vaccinees.

Seven. Eight children were vaccinated on the 19th October in the —— Workhouse in ——, by Dr. F. W. A., the Medical Officer. Owing to the fact that all the children had been discharged from the Workhouse, and had left no trace with the exception of F. P. and H. C., I have been unable to see them, and have not been able to ascertain whether by any possibility H. C.'s arm was infected with syphilis from one of those who were vaccinated before him. I have endeavoured to find these children through Dr. F. W. A., the Workhouse officials, and the Vaccination Officer, but hitherto without success. This is greatly to be regretted, since the instrument used for the vaccination of all the cases, a lancet with scarifier attached, is one that cannot but be regarded as a source of danger, especially in vaccinating children of the class usually found in our Workhouse nurseries.

[Since this report was written, four of the seven co-vaccinees of H. C. have been traced; namely F. P. (No. i. in the list given below), F. P. H. (No. v.), S. J. (No. vii.), and G. D. (No. viii.). See addendum to report, on page 397.]

The eight children vaccinated on the 19th October are given below in the order of their vaccination, according to the record contained in the nurse's book:

(i.) *F. P.*, aged seven years, discharged from the Workhouse and removed to ——. Arm believed to be well.

(ii.) *A. L.*, aged six months. Vaccination said by nurse to be normal, and when discharged the child was well.

(iii.) *M. M.*, aged twelve days. Discharged on the fourteenth day. The arm was doing well.

(iv.) *A. J. A.* Discharged on the fourteenth day. Arm was then doing well.

(v.) *F. P. H.*, aged nine days. Discharged on the fourteenth day. Arm looking well.

(vi.) *H. C.*, aged six days. [The subject of this report.] Discharged on the eighth day. The arm seemed then to be going on well.

(vii.) *S. J.*, aged six days. Discharged at the end of a month. Vaccination said to have been normal.

(viii.) *G. D.*, aged three days. Discharged on the fourteenth day. The arm was then doing well.

Sub-vaccinees.

None.

Course of vaccination and illness.

Up to the eighth day, when the child was discharged from the Workhouse, both Dr. F. W. A. and Nurse P., who was in charge of the Obstetric Ward, agree in stating that the child's arm did not show any abnormal symptoms. Mrs. C., the mother of H. C., at the inquest stated that the arm "got bad" three or four days before she came out of the Workhouse. This statement received no corroboration, and it would seem likely that Mrs. C. was confused in her dates, as she was also with regard to the time that the child was subsequently taken to the Middlesex Hospital.

On the 26th October, the eighth day after vaccination, Mrs. C. left the Workhouse, and during the next few days, the time at which the inflammation round the vesicles would naturally be at its height, the arm became so much inflamed that on Monday, the 31st October, she took the child to the Middlesex Hospital, where it was attended as an out-patient by Mr. Andrew Clark. The child at that time had a large slough at the point of vaccination 1½ inches long, oval, and with the centre necrosed.

Under Mr. Clark's treatment the wound continued to improve with simple dressings and cleanliness, and by the 24th November it had practically healed, without any suspicion having been aroused that the child was suffering

from syphilis, and without any anti-syphilitic remedies having been used. The arm was dressed with boracic ointment; cinchona and ammonia were administered internally.

Mrs. C., the mother, attended at the hospital every Monday and Thursday, and Mr. Clark paid a high tribute to the devotion with which she attended her child. Up to the 24th November it appeared that the child was on the way to recovery; on that day, the 36th day after vaccination, a papular and pustular eruption appeared on the face, chest, and arms; and there was a red rash about the anus, on the nates, in the groins, and round the scrotum. From the appearance of the rash Mr. Clark had no doubt that it was syphilitic, and considered the question whether it was congenital, or whether possibly it had been inoculated at vaccination. He did not consider that the vaccination wound ever had the appearance of a chancre. It was never indurated, but was merely a sloughing open wound (which healed under simple remedies), associated with a large inflamed gland in the axilla which subsided entirely under treatment, and did not remain indolent or indurated. From the appearance and distribution of the rash, and from the absence of any evidence of its having been in-vaccinated, Mr. C. was of opinion that the case was one of inherited syphilis. Under treatment both the rash on the body and the soreness round the nates much improved, but the child's general condition rapidly got worse, and he died on the 4th December.

Post mortem examination. The post-mortem was made by Mr. Clark five days after death. There was a rash on the arms and legs, and round nates and scrotum. The details of the internal examination are unimportant to the inquiry. Mr. Clark's opinion was that the child died from exhaustion following suppuration and sloughing, which had been consequent on vaccination, and he was distinctly of opinion that the child was the subject of congenital syphilis.

Method of vaccination. A lancet with a scarifier consisting of points at the reverse end was used. Dr. F. W. A. says that he is not certain that he always wipes the lancet between each vaccination, and the nurse at the Infirmary, whom I have seen, says that, although the lancet is generally wiped, the scarifier is not, and that the scratches are made on the children's arms with the scarifier, and the lymph is rubbed in with the lancet.

Treatment of vesicles. No application was made by Mrs. C., the mother, to the arm except under medical treatment, and as far as her condition would allow she seems to have done all that she could for the child.

Previous history. Up to the time of vaccination the child showed no sign of ill-health. Nurse P., who confined the mother, had no suspicion that either the child or the mother was syphilitic, and when they left the ward she believed that both mother and child were doing well.

Family history. H. G. C., the father, is an undersized, unhealthy-looking man, who says that he has been ill with pleurisy. He is attending as casualty out-patient at the Middlesex Hospital for dyspepsia. Examination gives no definite evidence of his having suffered from syphilis, and he entirely denies having had a chancre or any venereal disease, although he admits having exposed himself to the chance of infection. There is a small rather indistinct scar on the dorsum of the penis just behind the glands and covered ordinarily with the foreskin; he accounts for it by saying that it was due to a kick received when he was a boy at school. Whatever the nature of the scar this explanation may be reasonably doubted. There is no enlargement or induration of testicle or epididymis; glands in groins shotty, not large. No mucous tubercles round anus, mouth, or on palate. Slight pharyngitis. Right tonsil enlarged. Tongue clean, no sore or induration. No eruption on body except a few scattered papules which are not scaly or coppery. No old scars on body or legs; only one small foveated scar on chin. No tenderness or swelling of long bones. Pupils regular, equal, and active, no sign of old iritis. Optic discs clear, no evidence of choroiditis or retinitis.

Mrs. C., the mother, is a pale, delicate-looking woman, who states that her child H. C. was her first child, and that she had never before been pregnant. She entirely denies that she has had syphilis or any venereal affection. She suckled her child during the first month and did not suffer from any sore on the nipple. On the 14th December 1892 she allowed me to examine her, and I found on the right side of the vulva and just to the right of the external urinary meatus a small dusky red scar about the size of a threepenny piece constricted in the middle. It was quite healed and there was no induration. There were no mucous tubercles in or around vagina or anus, and no evidence of any ulceration except the scar above described.

About the nates there were some dusky brown spots not elevated, not scaly; they are about the size of a lentil. There was no eruption on the trunk or extremities. On the hands there were a few scars evidently the result of mechanical injury and said to be the result of burns. There was no scar of any kind about nipples or mammæ, and no mucous tubercles about lips or in mucous membrane of mouth or larynx. There was no ulceration about tonsils, palate, or pharynx, and no affection of voice. The teeth were regular and, as a rule, good. The corneæ were clear and the iris bright, the pupils regular and active. There was no sign of old iritis. The lenses and vitreous were clear, the optic disc normal, and the retina and choroid free from any evidence of syphilitic disease. There was no evidence of organic visceral disease. The first occasion on which the likelihood of infection occurred was 19½ months ago, and there has only been one source of infection as far as I have been able to ascertain. The evidence in regard to syphilitic infection of the parents is, as will be seen from the above statement, indefinite. At the same time both Mr. and Mrs. C. have scars which may be venereal, and which, if their statements are true, are more likely to be syphilitic than simple non-effective sores; from the fact that the destruction of tissue has been very slight, that the sore caused no inconvenience, and gave rise to no discharge. Mrs. C. also has a dusky brownish eruption which might be syphilitic, and she suckled her child without, as far as can be ascertained, contracting any disease from him.

General surroundings. The room at —— in which Mrs. C., her mother and sister live is one in which it would be well nigh impossible for any open wound to pursue a normal course. The filth and disorder are such as only the most abject poverty could tolerate. The room is ill-lighted, close, dirty beyond description, and in its present condition not fit for human habitation. There is little wonder that shortly after the child H. C. was removed into such conditions from the cleanliness and order of the Workhouse his arm became inflamed and finally sloughed. It is worthy of note that marked improvement took place when the wound was dressed with simple antiseptic applications.

Conclusion. The evidence strongly supports the view that the child H. C. showed manifestations of syphilis before his death, and that he died in consequence of exhaustion originally caused by sloughing of the vaccination wounds, the final catastrophe being precipitated by the generalisation of the syphilitic infection.

The history of the case does not seem to warrant the conclusion that syphilis was inoculated at the time of vaccination. The primary sore did not present the usual characteristics of a vaccinal chancre, and the early appearance after vaccination of the secondary eruption throws doubt upon the probability of its having been the direct consequence of vaccination; so that, although it must be admitted that the instrument used might have transmitted infection if a syphilitic child had been vaccinated immediately before H. C., there is no evidence to show that this was the case. Further there is a suspicion that both the father and mother had suffered from syphilis. The conditions under which the child lived after its removal from the Workhouse were sufficient to induce an unhealthy action in any wound, so that although H. C.'s death was doubtless accelerated by vaccination, taking all the circumstances into consideration, vaccination cannot be held to have been the sole or primary cause of the child's death.

Table 1.

Chronological statement of the case of H. C.

Week after Vaccination.	Date.	Day after Vaccination.	——
	Oct. 12th		Child born, October 12th, at —— Workhouse. Mother's first pregnancy. Confinement without complication at eighth month. Nurse did not suspect syphilis.
1st week	19th		Child well. Vaccinated, sixth of eight children. Calf lymph (Pissin's). Scarifier and lancet used. Scarifier? not cleaned. Child vaccinated previous to H. C. showed no sign of syphilis.

Week after Vaccination.	Date.	Day after Vaccination.	—
2nd week	26th	8th	Discharged from Workhouse. Arm believed by nurse to be doing well: during the next three or four days arm much inflamed; by 13th day after vaccination a slough had formed; taken to Middlesex Hospital on the 31st October.
3rd week	Nov. 2nd	15th	Child under care of Mr. A. Clark. Sore treated as a simple sloughing wound: there was no induration of base, and no suspicion of its being syphilitic.
4th week	9th	22nd	Arm continued to improve; no specific treatment adopted. Inflamed gland in axilla subsided; no chancre formed at point of inoculation.
5th week	16th	29th	Improvement of arm continued; sore treated with boracic ointment; cinchona and ammonia administered internally.
6th week	23rd	36th	Arm practically healed. Papular and pustular eruption appeared on face, chest, and arms; first noticed November 24th. Red rash round scrotum, anus, and on nates.
7th week	30th	43rd	Child's general condition much worse. Emaciation rapid. Death, December 3rd, 1892. 45 days after vaccination.
	Dec. 7th		

Table 2.

Symptoms in the case of H. C. compared with those typical of hereditary and vaccinal syphilis in infants.

H. C.	*Hereditary Syphilis.*	*Vaccinal Syphilis.*
No chancre at point of inoculation.	No chancre at point of vaccination.	An initial chancre at point of vaccination invariable.*
No indolent bubo, but an acutely inflamed gland subsiding quickly under treatment.	No induration of glands in relation with seat of vaccination.	Indolent bubo the rule. Duration of both the above often prolonged without specific treatment.
Evolution irregular. Ulcer formed by 12th day. No induration. Ulcer healed in six weeks without any specific treatment. Evidence of general infection by end of fifth week.	Evolution irregular, as a rule commencing with general symptoms.	Evolution regular. I. Incubation. II. Chancre. III. 2nd Incubation. IV. Generalization. General infection never before the 9th or 10th week after vaccination: Fournier. 6th to 10th week: Hutchinson.†
Rash papular and pustular, chiefly on face, chest, and arms.	*Rash* papular and pustular often chiefly on the face.‡	*Rash* polymorphic, symmetrical. In acquired syphilis seldom on face and hands.§
Not preceded by any roseola on abdomen.	Roseola on abdomen not the rule.	Roseola on abdomen very common.
Much rash and excoriation round nates and scrotum.	Rash and excoriation round nates and scrotum common.	Rash and excoriation round nates not common. Mucous tubercles commonly present.
Family history gives grounds for suspecting syphilitic infection of mother. Mother contracted no sore from child whom she suckled.		

* Fournier. Leçons sur la Syph. Vacc. Paris, 1889, p. 150.
Bohn. Handbuch der Vaccination, p. 338, parag. iv.
Peiper. Schutzpockenimpfung. Wien, p. 62.
J. Hutchinson. Illustr. of Clin. Surgery, 1878, p. 114.
† Syphilis by Jonathan Hutchinson, 1889, p. 114. If *without* treatment 6-10 weeks, but if treated with mercury 5-7 months; Illustrations of Clinical Surgery, p. 133.
Fournier. Loc. cit. p. 132.
‡ Fournier. Loc. cit. p. 148.
§ Hutchinson. Loc. cit. p. 22.

I append a copy of the depositions taken at the inquest.

Addendum. Thanks to the energy and courtesy of Mr. G. J. M., Vaccination Officer, I have been enabled to trace four in the seven other cases who were vaccinated with H. C of the —— Infirmary on the 19th October 1892. They are as follows (in the order of vaccination):—

F. P. (vaccinated first). On the 31st January 1893 this child was an inmate of —— Orphanage. Dr. M., Medical Officer of the Institution, informs me that the child's vaccination "followed the normal course, and there "are no indications that the boy has ever suffered from "syphilis either congenital or acquired."

F. P. H. (vaccinated fifth). Living in cottage at back of ——. Seen on the 21st February 189 . A first and only child; is plump, with a skin which would be clear of eruption if not covered with flea bites. There is no sign of syphilis either congenital or acquired. Vaccination was followed by a good deal of inflammation and some purulent discharge, but there was no eruption on body and no enlargements of axillary glands. There are now (21st February 1893) two puckered scars; one due to the coalescence of two pocks has a long, hard, puckered cicatrix. Mrs. H., who suckled her child, has had no sore on nipple, general eruption, sore throat, or other evidence of acquired syphilis. Her home and surroundings are utterly filthy and neglected.

S. J. (vaccinated seventh). Died on the 24th November 1892. The mother on the 12th February 1893 was in the —— Home, at ——, and, as the superintendent informs me, in good health. Dr. C., of ——, who attended the child, informs me that he very carefully examined it to satisfy himself as to the cause of death, but found no lesion or disease. The child was out at nurse, but he believes well looked after. He filled up the certificate "primary cause "of death, premature birth; secondary, anæmia or mal-"assimilation." He believes that there was nothing unhealthy or of the nature of a chancre about the vaccination sores, which seemed to be healing well, and there was no sign or symptom of general or local syphilis either acquired or inherited.

G. D., or G—d, or B. (vaccinated eighth). On the 21st February this child was in the Alexandra ward, of Great Ormond Street Hospital for Sick Children, under the care of Dr. Sturges. She was suffering from marked symptoms of meningitis, was profoundly emaciated, and seemed not likely to live long. The vaccination wounds were five weeks in healing, as the mother informs me, but there was no complication with the exception of a few supplementary vesicles which formed round the points of inoculation. There was no general eruption, and the wounds remained firmly healed after once cicatrizing. There were on the 21st February three regular rather depressed scars without induration or pigmentation. The child had shotty glands in groins, axilla, and neck, but there were no mucous tubercles, nor any evidence of congenital or acquired syphilis. The child died on Sunday, the 26th February. A post-mortem was made on the 28th February. Death was due to general acute miliary tuberculosis affecting the lungs, spleen, mesenteric glands, pia mater, &c. The disease was very intense and widely distributed. With regard to the possibility of tubercle having been inoculated it is to be noted:—

(i.) That there was no induration of any kind on or round the vaccination scars which were soundly and completely healed.

(ii.) That there was no enlargement or induration of the axillary glands; they could not be felt through the integuments and were only found after dissecting out the axilla.

(iii.) There was no enlargement of the cervical glands.

In view of these facts there is no ground for supposing that the vaccination wounds were the point of origin of the tubercular infection. There was no evidence external or visceral of syphilitic disease.

Note.—Of the remaining four children vaccinated in the —— Infirmary, on the 19th October 1892, A. L., M. M., and A. J. A., vaccinated second, third and fourth respectively, cannot be traced; H. C., vaccinated sixth, is the subject of this report.

From the above statement it will be seen that, as far as can be ascertained, neither the child who was vaccinated immediately before or immediately after H. C. shows any sign of syphilis either invaccinated or congenital, and in so far as the facts obtainable warrant any deduction, they do not support the view that the symptoms of syphilis shown by H. C. were due to the transference of the taint to him from some child previously vaccinated or through the lymph with which vaccination was performed.

THEODORE DYKE ACLAND, M.D.

(*Copy of depositions taken at Inquest*).

Informations of Witnesses taken and acknowledged on behalf of Our Sovereign Lady the Queen touching the death of H. C. at —— on Friday, the ninth day of December, One thousand eight hundred and ninety-two, before J. T., Esq., Her Majesty's Coroner for —— on view of the Body of the said person then and there lying dead, as follows :—

E. C. sworn, saith :—

I am the wife of H. G. C., a marble polisher. I live at ——. The deceased is my son H. C. He was born on the 12th October last—he is my first child. I was confined by a doctor. He appeared to be strong. I was confined at —— Workhouse. I was there a fortnight. I came out on the 26th Oct. The child was vaccinated on the 19th Oct. I saw him vaccinated. Dr. F. W. A. did it. I made no objection. I was not asked. The arm got very bad before I went out. Dr. F. W. A. did not see it but the nurse did. I went home. On the following Monday his arm got so bad that I took him to Middlesex Hospital under Mr. Clark. I took him every Monday and Thursday for five weeks until he died on Saturday last at 3.30 a.m. Dr. F. W. A. saw the child at 8.30 on Friday. I never touched the arm myself. The first time I went to the hospital the doctor dressed the arm and gave me a lotion to wash the arm, another to dress it with. He told me to do it often. I did it three or four times a day for about three weeks. The arm began to get better, and then I had ointment from the hospital to put on it. This continued till yesterday week. I then had a mixture for him every hour. I gave that. The arm began to get bad three or four days before I went out of the House. The vaccination marks all went into one place after I left Workhouse about another week. The arm got inflamed and swelled up before I left the House. The date I first went to the hospital was the 7th Nov. I produce the letter, the date there is the 31st Oct. I suppose that is correct. There was a large lump under the arm. I noticed that just a week after I first took him to the hospital. A rash came out the beginning of last week; first on his forehead, on his face and arms, and on his bottom. I have always looked to the child myself. I was married on the 2nd Oct. last. My husband has not since been with me. I live with my mother. We have two rooms. There were four children of hers also in it. I have never had any syphilis. I have not been with any other man. I fed the child by breast until he was a month old, after that I had no milk. I got no sore on the breast from weaning him.

H. G. C. sworn, saith :—

I live at ——. I am a marble polisher. I am the father of the child. I am not living with the mother. I have had the pox. [?—T.D.A.] I did not give it to my wife. I am suffering from pleurisy. I have never had pox.

M. L. sworn, saith :—

I am the wife of T. L., a tailor. I live at ——. I am Mrs. C.'s mother. She will be 21 next August. I saw the child when she came out of the House. I did not notice it much. I first noticed it after she took it to the hospital. She took care of it.

Andrew Clark sworn, saith :—

I am surgeon at the Middlesex Hospital. I first saw the child on October 31st at the hospital. It had a large slough about 1½ inches long and rather oval on the arm, centre dead. I was told it had been vaccinated. I treated it. This went on and it improved. On November 24th I saw a rash on face, chest and arms. I suspected something and found a rash on scrotum and back side. They resembled congenital syphilis. The sore had not the appearance of communicated syphilis. The child was an eight months child. I prescribed the usual treatment for congenital syphilis. The rash rapidly improved. The child got weaker and weaker. I made a post-mortem examination on Wednesday afternoon last. Body emaciated, remains of rash on legs, buttocks, and scrotum. Scar on left arm size of halfpenny. Brain very soft. All organs healthy. Stomach quite empty and contracted. I think the child died from exhaustion following the suppuration and sloughing. I think the child had congenital syphilis. The sloughing followed vaccination. I do not think a child of a week if any syphilis is present should be vaccinated. But vaccination is not injurious to it. Sloughing may occur in any case. The rash was a tubercular form of rash. I saw the inflammation of gland under arm, it was trifling. It is a point in dispute if syphilis may be communicated by vaccination.

F. W. A. sworn, saith :—

I am Medical Officer of the —— Union. I remember vaccinating the child on October 19th. It was vaccinated with six other children with same lymph. It was German lymph. It was prepared by Dr. Pissin. "Emulsified" lymph. It is used by the German army and it is approved by the Board of Trade. It is calf's lymph only. The greatest care was taken by me. The child seemed a fairly healthy child. I had not noticed anything wrong with it.

CASE 208, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of E. G. C. : report to the Commission of Dr. Arthur Pearson Luff.

In December 1892 I was requested by the Commission to investigate the circumstances attending the death of E. G. C., late of ——, and the alleged connexion of the death with vaccination.

The entry in the register of the death of the child was to the effect that E. G. C., aged three months, died on the 4th December 1892, the cause of death being certified by Dr. H. J. B., of ——, as "vaccinia, six weeks; pyæmia, "four days."

I proceeded to —— on the 13th December 1892, and first interviewed Dr. H. J. B., who had himself vaccinated the child. Dr. J. H. B. informed me that the vaccination had been done with calf lymph from a tube supplied by Dr. Renner. He vaccinated the child on the 26th October 1891, in four places and inspected the case on the 2nd November (seven days after vaccination), when all the vaccination marks presented a normal and healthy appearance. On the 3rd December (38 days after vaccination) he was called in to see the deceased, and he then found a large gangrenous slough, about 3 inches long by 2½ inches wide, occupying the vaccination area. It had a very fetid odour, and there was inflammation of an erysipelatous character extending down the arm to the hand. The child appeared to him to be in a moribund condition. The wound had apparently been dressed last with fuller's earth. There were pustules in different stages of development over all parts of the body, the earliest developed ones being on the face and scalp. There was one pustule on the palate at the junction of the hard and soft palate, and about 20 pustules on the head and face. He considered the pustules were undoubtedly those of vaccinia. There was an abscess in the joint of the great toe of the right foot, and another abscess was forming in the right heel. The child was of a yellow pyæmic colour. Death occurred on the 4th December, on the day following his being called in and 39 days after vaccination. I next interviewed Mrs. C., the mother of the deceased child E. G. C., who informed me that deceased was her fifth child. On the 14th November (19 days after vaccination) three of the vaccinated places had run together, this fusion of the three places gradually taking place between the 7th November and the 14th (i.e., from 12 to 19 days after vaccination). She dressed the arm with vaseline, and subsequently with sweet oil, bread and milk poultices, Condy's fluid and dried rag. About the 12th November (17 days after vaccination) she first observed three spots on the forehead of the child, which appeared at first to be filled with water, but which subsequently became converted into matter. Smaller spots afterwards appeared on the scalp, ears, abdomen, toes of the right foot, and one on the middle finger of the left hand. The child became very feeble and fretful, and suffered during the last three weeks of life from vomiting. There was no diarrhœa, no convulsions, and no appreciable loss of flesh. The child was a full term one, and, in her opinion, was healthy when born. She did not call in medical assistance until the 3rd December, when the child was dying, as the father (a retired draper's assistant) considered he was competent to treat the child.

Sanitary surroundings.

I next inspected the sanitary arrangements of the house, and found them to be in an extremely good condition, and I should not ascribe the condition of the wound to defective sanitation.

Source of lymph.

Dr. H. J. B. informed me that he had received three tubes of calf lymph from Dr. Renner on the 25th October 1892, the number quoted by Dr. Renner on the tubes being ——; that with one of the tubes he had vaccinated the deceased, with the second tube he had vaccinated a child F. A. B., and the third tube he handed to me, and it is still in my possession.

I next inspected F. A. B., the child vaccinated from the second tube of lymph. This child was vaccinated on the 29th October 1892; the vaccination had run a perfectly normal course, and when seen by me on the 15th December (47 days after vaccination) the child was in a healthy state and the vaccination had been a fairly successful one.

In order to ascertain to some extent whether it was possible that the calf lymph employed to vaccinate E. G. C. might have been the source of septic infection, Dr. Renner at my request addressed a circular letter to about 440 medical men who had been supplied by him with tubes of lymph taken from the same calf as the lymph sent to Dr. H. J. B. on the 25th October, 1892. The following is a copy of the letter with a list of the questions that the medical men were requested to answer :—

DEAR SIR, Dec. 21st, 1892.

I HAVE been requested to furnish the results from a batch of calf lymph in an inquiry which is to be placed before the Royal Commission on Vaccination.

On October —— I supplied you with —— tubes from the source in question, and I shall be much obliged if you will kindly fill in the circular on other side and return it at your early convenience, for which purpose I beg to enclose stamped and directed envelope.

I am, &c.
C. RENNER.

Questions to be answered.

(1.) Number of vaccinations?
(2.) Whether successful?
(3.) Whether any inflammation?
(4.) Whether followed by suppuration?
(5.) Whether followed by ulceration?
(6.) Whether followed by rash?
(7.) Whether followed by other complication?

Nearly 400 replies were received to this circular, and the following is a summary that I have made of the answers to the questions. The calf lymph used in all these vaccinations was obtained from the same calf as that used for the vaccination of E. G. C.

Questions.	Answers.
1. Number of vaccinations.	1,159.
2. Whether successful	1,139 cases successful. 20 cases did not take.
3. Whether any inflammation.	1,058 cases. No inflammation. 82 cases. Slight „ 19 „ Inflammation.
4. Whether followed by suppuration.	1,146 cases. No suppuration. 13 cases. Suppuration. Remarks on cases of suppuration. — 2 cases doubtful; 3 „ very slight; 1 „ from friction of a pad; 1 „ „ „ sleeve.
5. Whether followed by ulceration.	1,150 cases. No ulceration. 9 cases. Some „ Remarks on cases of ulceration. — 1 case doubtful; 1 „ very slight; 1 „ superficial ulceration from pulling off scabs; 2 cases ulceration due to friction of sleeve.
6. Whether followed by rash.	1,139 cases. No rash. 20 cases. Some rash. 1 case. Scarlatiniform eruption on the 11th day, which was gone on the next day. 3 cases. Papular rash. 3 „ Bright red rash. 2 „ Pustular rash. 2 cases. Rash on 3rd day completely covering the whole of body and face; disappeared without treatment. 1 case. Rash from friction of sleeve. 1 case. Urticarial rash. Remarks as to nature of the rashes. — 1 „ Eczema; child had tendency to it before vaccination; 1 case. Sudamina after two weeks. 1 „ Eczema. 1 „ Red rash like scarlet fever; on the 13th day the condition of the child was normal. 1 case. Pustular rash round the seat of vaccination, but none on the body. 1 case. Small-pox developed 10 days after vaccination, but very much modified compared with an elder sister who was laid up at the same time with small-pox. 1 case. No remarks as to nature of rash.
7. Whether followed by other complication.	Not one case.

I am of opinion that the deceased child E. G. C. died of pyæmia from the vaccination sores becoming poisoned with some septic matter. I have been unable, after a most thorough inquiry, to trace the source of this septic matter, but I am of opinion that it was not derived from the calf lymph used in the vaccination of the deceased, for the following reasons :— *Conclusion.*

(i.) When deceased was seen by Dr. H. J. B. on the 7th day after vaccination, all the vaccination marks presented a normal and healthy appearance.

(ii.) Dr. H. J. B. was not called in again to see deceased till the 38th day after vaccination, when the vaccination sores were found confluent, and in a sloughing and gangrenous condition, and there was erysipelatous inflammation down the arm as far as the hand. According to the mother the arm went on well up to the 12th day, and between the 12th and 19th days three of the vaccinated places became bad and ran together.

(iii.) The other child, F. A. B., vaccinated from one of the same batch of tubes as deceased, did not suffer any ill-effects from vaccination.

(iv.) The results of 1,159 vaccinations made with lymph taken from the same calf as deceased was vaccinated from show that there was not a single case of death nor of septic disease after vaccination similar to that which deceased suffered and died from.

ARTHUR PEARSON LUFF, M.D.

CASE 209, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of M. F. L.: report to the Commission of Dr. Theodore Dyke Acland.

M. F. L., aged five months, of ——, was vaccinated by Dr. G. F. G. on the 2nd November 1892. *Vaccination.*

11th December, 1892. *Death.*

"Vaccination with animal lymph; two normal vesicles; "39 days. Gastro-enteritis 27 days." *Certified cause.*

Dr. G. F. G., of ——. *Certified by.*

Calf lymph obtained from Dr. R., 31st October 1892. *Source of lymph.*

Dr. G. F. G. vaccinated one other child with a tube of lymph from the same batch. It was a private case and I was unable to see it, but Dr. G. F. G. informed me that vaccination was normal and that the child was well. *Co-vaccinee.*

None. *Sub-vaccinees.*

Careful. An ordinary lancet was used which is cleansed after each vaccination and is kept in good order. *Method of vaccination.*

Vaccination pursued a normal course throughout according to both Mrs. L., the mother of the child M. F. L., *Course of vaccination and illness.*

and Dr. G. F. G. The child was inspected on the eighth day and had then two healthy looking vesicles. Three days later the child's arm was a good deal inflamed. It was then seen and attended by Mr. H. at Dr. G. F. G.'s dispensary at ——. Mrs. L., the mother, informed me when I visited her at her house on the 16th December, 1892, that the inflammation speedily subsided under the simple treatment recommended, viz., bathing with hot water and powdering with starch, and Dr. G. F. G. informs me that the arm was entirely healed on the 24th December. Mrs. L. states that subsequent to the 12th November, the date on which she went to the dispensary, she did not see Dr. G. F. G. until the 24th November, but Dr. G. F. G. informs me that he was called to see the child on the 21st November. These dates, as it will be seen, do not tally; and I have been unable to reconcile them. Dr. G. F. G., however, states that when he saw the child she was very weak, and her appearance suggested disease of the digestive organs. He further states that he was informed by the mother that the child had been in the same condition for three or four days, and that she had not really rallied since the vaccination, from which time she had sucked feebly and vomited soon after taking the breast. He adds "the subsequent course of the child's illness "confirms the conclusion that it was suffering from a low "form of gastritis with probably enteritis, although the "character of the stools did not suggest inflammation of "the large intestine." The child was treated homœopathically by Dr. G. F. G. all through her illness. He informs me that he considered that her health failed in consequence of the ordinary course of vaccination. Mrs. L., the mother, stated to me that the child vomited and that her bowels were irregular, but that there was no diarrhœa, the motions being hard and green. No further symptoms developed, but the vomiting seems to have continued and the child had convulsive movements. From this condition the child did not rally, though the arm was completely healed some time previous to her death.

Treatment of vesicles. None, except under medical advice.

Previous history. The child's health previous to vaccination was presumably good, although Mrs. L. stated to me that Dr. G. F. G. had said that she was too feeble to be vaccinated; this, however, Dr. G. F. G. denies. He says that on the day of vaccination he considered "according to custom its suitability, "and told the mother that, although it did not appear a "very robust child, there was nothing in his judgment to "prevent its being vaccinated."

Family history. Mrs. L., the mother, informed me that on the 28th November she consulted Dr. G. F. G., that the flow of her milk had been scanty for a few days, and that she did not feel well. He prescribed for her, and on his next visit she was apparently in her normal condition of health. Dr. G. F. G., therefore, came to the conclusion that her ill-health was not a sufficient cause for the illness of the child.

General surroundings. Nothing of importance elicited.

Summary. The child died in consequence of some disturbance of the digestive organs immediately subsequent to vaccination. How far vaccination contributed to the child's illness and death there is no certain evidence to show. Probably the constitutional disturbance due to vaccination was an accelerating cause; but it should be noted that an interval of twelve days, according to Mrs. L., of nine days, according to Dr. G. F. G. intervened between the time that the inflammation round the vesicles had entirely subsided and the date on which the child was sufficiently ill to be taken to a doctor. It is also certain that during the time of the child's illness the mother, who was suckling the child was not in good health and that her milk is said to have been scanty.

THEODORE DYKE ACLAND, M.D.

CASE 211, REPORTED TO THE COMMISSION BY MR. J. H. LYNN.

Case of W. M.: report to the Commission of Dr. Arthur Pearson Luff.

In December 1892 I was requested by the Commission to investigate the circumstances attending the death of W. M., late of ——, and the alleged connexion of the death with vaccination.

Mr. J. H. Lynn's letter of the 12th December 1892 informing the Commission of the case stated:—"Permit "me to call attention to the case of W. M., son of a printer "of ——, who was vaccinated when a fortnight old and "died a fortnight or so later. Dr. J. J. T. attributed "death to pleuro-pneumonia following pyæmia, and "thought the seat of the poisoning was the vaccination "wound. The Medical Superintendent of the —— Infir-"mary vaccinated the child from humanised lymph. The "verdict of the Coroner's jury was 'accidental death?' The "inquest was held on the 3rd inst. at ——, Dr. McD., "Coroner."

The depositions taken at the inquest were to the following effect:—

C. M., sworn, said that she was the wife of H. M., a printer. The deceased, W. M., was her child; he was one month old. She was confined in the —— Infirmary. The deceased was a fine healthy baby; when it was two weeks old Dr. H. L. vaccinated it; he used a thin tube. She left the Infirmary on Saturday, the 19th November. On the following Tuesday she noticed that the deceased's arm was swelling very much and took him to St. Bartholomew's Hospital on the Thursday. They examined the child and gave her four pills for him. She gave him two, but that did not seem to do him much good, his arm swelling dreadfully, and the inflammation got into his hand. On the Saturday she took deceased to a chemist, who gave her a box of ointment. On Tuesday last he was so bad that she called in Dr. J. J. T., and deceased died on Wednesday. Deceased's life was not insured.

J. J. T., sworn, said that he was a L.S.A., and registered, and resided at ——. He saw the deceased on Tuesday when he found it in a moribund condition, and it died shortly afterwards. He found three vaccination scars, two scabbed over, and one with the scab partially detached. There was no exudation from any of them. On making a post-mortem examination he found pus in both wrist joints. The chest was full of serous exudation. The right lung was solid and the left collapsed. All the other parts were normal. The cause of death was pleuro-pneumonia and pyæmia.

H. L., sworn, said he was a M.R.C.S., and Medical Superintendent of the —— Infirmary. He vaccinated the child with human lymph from a tube procured from the Public Vaccination Station, and the other children vaccinated from the same lymph did well.

The verdict was to the effect that the said W. M. did die from the mortal effects of pyæmia and pleuro-pneumonia, and that such death was due to accidental causes.

Mr. H. L., the Medical Superintendent of the —— Infirmary, informed me that the child was vaccinated from selected lymph obtained from the Public Vaccination Station in ——. Two other children were vaccinated from the same lymph. One of these was unsuccessful, the other ran an ordinary course. With regard to the deceased child W. M., the arm was in a satisfactory condition at the time the child left the Infirmary five days after vaccination. The child was treated for purulent ophthalmia at St. Bartholomew's Hospital, and the mother, he remembered, stated at the inquest that the doctor at the hospital made no remark about the arm, but gave her some simple ointment to apply. The Coroner, Dr. McD., remarked at the inquest that there did not appear to be much evidence of pyæmia from the description of the vaccination cicatrices given by Dr. J. J. T.

Vaccinifer and co-vaccinees. I have made several endeavours to find the vaccinifer from whose arm the tube of lymph employed in the vaccination of the deceased was taken, and also to find the two other children vaccinated from the same lymph, but I have been entirely unable to trace them owing to their parents having left the addresses that were obtained. On inquiry at St. Barthomolew's Hospital of the House Surgeon who saw the deceased on the occasion that he was taken there, I only elicited the fact that the House Surgeon could not recall to memory the case.

Conclusion. From the different inquiries that I have made I have not ascertained anything that would be opposed to the information that the cause of the child's death was due to accidental causes.

ARTHUR PEARSON LUFF, M.D.

Case 212, reported to the Commission by Mr. J. H. Lynn.

Case of E. E. G.: report to the Commission of Dr. Arthur Pearson Luff.

On the 27th June 1893 I proceeded to ——, and there made, at the request of the Commission, an inquiry into the circumstances attending the death of E. E. G., and the alleged connexion of the death with vaccination.

Mr. J. H. Lynn's letter of the 12th December 1892 informing the Commission of the case stated:—"E. E. G., "child of J. G., of ——, was vaccinated when nearly two "months old by the Public Vaccinator, Mr. R. T. M., "M.R.C.S., 'from a child named A. S. who is said to have "'had a rash all over its body.' She was a fine healthy "child and suffered no ailment whatever until vacci- "nation. There were four punctures. Three 'took.' On "the ninth day the marks became inflamed and by night "were black and dry. Diarrhœa and sickness set in, the "stools were black and the child died in convulsions "18 days after vaccination, on the 25th November "1892. Dr. A. attended. Death was certified to be due "to diarrhœa and convulsions."

I first interviewed Mr. R. T. M., the Public Vaccinator, who informed me that the child was vaccinated from A. S. on the 8th November 1892. A. S. was at the time in a healthy condition, the vaccination being a good and successful one, which had taken in four places; he carefully examined the child on the 8th November, and also when he vaccinated her on the 1st November, and at neither time had it any rash on her body. This statement is also confirmed by Mrs. S., the mother of the child, who informed me that her child, A. S., had no rash upon her body at the time of her vaccination, or at the period when E. E. G. was vaccinated from her. From A. S. there was vaccinated at the same time as E. E. G. only one other child, viz.:—C. H. F., of ——. This child was vaccinated in four places, all of which took; he was inspected on the 15th November, when the vaccination was passed as a good and successful one. I saw the two children, A. S. and C. H. F., and found them both to be healthy children, in whom the vaccination had run a normal course.

The deceased child, E. E. G., was also inspected by Mr. R. T. M., Public Vaccinator, on the 15th November, seven days after vaccination, when the arm was in a normal and healthy condition for the period of vaccination, three of the four places had taken, and the vaccination was passed as a good and successful one. Three or four days later the child was attacked with diarrhœa and sickness, and was attended by Dr. A., who considered that it was suffering from tubercular disease of the bowels, there being a strong tubercular history in the child's family. Later, convulsions set in, and the child died on the 25th November—the certified cause of death being marasmus and convulsions. At the time of death there was nothing unusual to be noticed in connexion with the vaccination marks; at no time were they inflamed, nor was there anything abnormal or wrong about the scabs. The death was not, either in the opinion of Dr. A. or Mr. R. T. M., connected in any way with the vaccination, the child being, according to their statements, a poor, puny child, and in a very weak condition at the time the fatal illness commenced.

I next interviewed the mother of the deceased child, who informed me that she suckled the child the first month of her life, but then was obliged to leave off, being ill (the mother suffered then and does now from tubercular disease); the child was then taken care of by Mrs. C., of ——, and was brought up entirely on condensed milk and rusks. The mother informed me that she had never in any way considered that there was any connexion between the illness and death of the child and the child's vaccination; that she had never said so to anyone, and that the idea had never crossed her mind.

Mrs. C., who had charge of the child, informed me that from the period of vaccination until the occurrence of the death of the child, she never saw anything wrong with the vaccination marks, which appeared to her to be running an ordinary course, from the experience which she had had of vaccination in her own children; and that she had never stated to anyone that she considered the death of the child to be in any way connected with vaccination.

I last interviewed Mr. G., the father of the child, a porter employed at the —— station of the Great Northern Railway. He informed me that he did not think that there was any connexion between vaccination and the death of the child. He is not a believer in vaccination, but he has had all his children done, as vaccination is required by law; he would have made no complaint of the death of his child, as he never considered that it was in any way caused or hastened by vaccination; but in December last a Unitarian minister,—Mr. L.—who was at the time residing in ——, came twice to him, asked him various questions about the vaccination and death of his child, and asked him if he would give evidence that vaccination was the cause of death; this he refused to do; that was the only way in which he could account for the information which was contained in Mr. Lynn's letter of the 12th December 1892.

Conclusion.

To take the statements contained in Mr. Lynn's letter of the 12th December 1892, seriatim:—Firstly, I do not find that the most important statements are in accordance with facts; the vaccinifer, A. S., is stated in his letter to have had a rash all over her body; this is absolutely denied by the vaccinating doctor and by the mother of A. S.; secondly, the deceased child, E. E. G., is stated therein to have been a fine healthy child and suffered no ailment whatever previous to vaccination, whereas the medical opinion was that it was a puny, weak child, it was only able to be suckled by the mother for one month, and after that time was brought up on condensed milk and rusks, and, according to the mother's statement, she considered it never looked strong enough to live very long; and thirdly, it was stated in the letter that the marks became inflamed on the ninth day, and by night were black and dry, this condition was never seen either by Dr. A., who was in attendance, or by the woman who had charge of the child at the time; the diarrhœa and sickness which set in were due partly to the tubercular disease of the bowels from which the deceased child suffered, and partly to the nature of the food with which it was being fed.

I do not consider that the fatal illness of the child was connected with vaccination, for the following reasons, viz.:—

(i.) The vaccinifer, A. S., was, and is, a healthy child, in whom the vaccination ran a normal course.

(ii.) The other child, C. H. F., vaccinated at the same time as the deceased, and from the same source, was, and is, a healthy child in whom the vaccination has run a normal course; and,

(iii.) The deceased child was inspected by the vaccinating doctor on the eighth day after vaccination, was passed as a good and successful vaccination, and up to the time of its death nothing unusual or wrong in connection with the vaccination marks was seen either by the medical man who attended the child up to its death, or by the woman who had charge of it.

Arthur Pearson Luff, M.D.

Case 213, reported to the Commission by the Local Government Board.

Case of A. T.: report to the Commission of Dr. Arthur Pearson Luff.

In December 1892 I was requested by the Commission to investigate the circumstances attending the death of A. T., late of ——, and the alleged connexion of the death with vaccination.

The entry in the register of the death of the child was to the effect that A. T., aged four months, died on the 11th December 1892, the cause of death being certified by Mr. P. J. R., L.S A., of ——, as "vaccination; "erysipelas; exhaustion."

On communicating with Mr. P. J. R. at once, I received information that the child's body was still unburied and could be inspected by me. Mr. P. J. R. also stated:—"The "case had been reported under the Infectious Diseases "Notification Act as one of erysipelas by a House Surgeon "of St. Bartholomew's Hospital before I saw it. When "the case came under my notice the erysipelas was gradu- "ally extending from the vaccination wound on the arm "over the whole surface of the body. I don't for a "moment believe that the erysipelas was caused by the "vaccine, but I believe it was caused through the scab "not being properly cared for and protected."

On the 16th December I proceeded to ——, and there saw the body of A. T. It was that of a fairly nourished child, and had undoubtedly had erysipelas or cellulitis, which had extended all over the left arm, across the trunk to the other arm, and both extremities. Upon the left arm, in the usual place, there were four vaccination marks

which had not healed and which had evidently been slightly discharging at the time of death. The marks were partially granulated over and did not look very unhealthy. There was no gangrene at the edges of the vaccination marks, no undermining of the skin, and no sloughing.

The mother's statement, which I took down at the time, was to the effect that deceased was vaccinated on the 10th November, 1892, by Dr. J. R. G., of ——, the Public Vaccinator for the —— district. She was taken on the 17th November for inspection, at which time the arm seemed to be in a rather backward condition, but not at that time inflamed in any way. The case was passed by Dr. J. R. G. as one of successful vaccination, and one child was vaccinated then. On the next day (the eighth day after vaccination) inflammation started around the spots and extended down as far as the middle of the forearm; and by the 19th (the ninth day after vaccination) the glands in the left armpit began to swell. The child did not suffer from convulsions, vomiting, or diarrhœa. An abscess formed under the left arm, and broke on the 24th (14 days after vaccination), and then the arm became much worse. On the 26th November (16 days after vaccination) she took the child to Dr. J. R. G., who ordered poultices to be applied to the arm, and a powder to be dusted over it. On the 29th November (19 days after vaccination) she took the child to St. Bartholomew's, as it seemed to her worse; and it was "notified" from there by Mr. R. G. Hogarth, one of the present medical officers, as a case of erysipelas. She then brought the child back home and called in Mr. P. J. R.

Mr. P. J. R. informed me that all the four places on the arm were discharging when he first saw the child on the 29th November. The skin around the vaccination spots was hard and shiny, and there was an erysipelatous inflammation extending over the left shoulder to the middle of the forearm, and across the chest on the left side as far as the sternum. The erysipelas afterwards spread across the shoulder, down the other arm, and then to the abdomen and both legs. The temperature for the first two days, after he was called in, remained at about 102°; it then, under treatment, fell to 100° and kept at about 100° until death occurred on the 11th December. He notified the case as erysipelas to the Medical Officer of Health.

On making inquiries I heard of cases of erysipelas that had occurred recently in the neighbourhood, but there was no case of erysipelas known amongst any of the friends or relatives of the mother of the deceased.

Sanitary surroundings. Mrs. T., the mother of the deceased, was a lodger in ——, and I was refused permission by the landlord of the house to make any inspection of the sanitary arrangements, which were apparently in a bad condition.

I next proceeded to Dr. J. R. G., the Public Vaccinator for the —— district, in order to obtain from him the names and addresses of the vaccinifer of A. T. and any other children vaccinated from the same source. The delay that has elapsed since making my first inquiries in connexion with this case in December 1892, and sending in this report in March 1893, is due to the discourtesy that I received at the hands of Dr. J. R. G., who sent no reply to many inquiries made, both personally at his house and by letters addressed to him, until the end of last month when pressure was brought upon him by the Local Government Board. He then informed me that the deceased A. T. was vaccinated from W. T. H., of ——, and that from the same child, and at the same time, M. M. of ——, was also vaccinated.

Vaccinifer and co-vaccinee. On making inquiries I found that the vaccinifer W. T. H. had left the address given to me, and could not be traced. The other child, M. M., vaccinated from the same source as the deceased, was seen. She was a healthy child, in whom the vaccination had run a perfectly normal course—the mother stating that on the 14th day the vaccination marks were nearly healed, and on the 21st day they were quite healed.

Conclusion. The deceased child, A. T., in my opinion died of erysipelas which was probably contracted through the sores produced by vaccination, but, in my opinion, the poison of the erysipelas was not introduced with and at the time of the vaccine virus, for the following reasons, viz.:—

(i.) On the seventh day after vaccination, when the child was inspected, the vaccination spots were in a healthy condition, and the case was passed by the vaccinator as one of successful vaccination.

(ii.) On the 16th day after vaccination, the child was again seen by a medical man, on account of the inflamed condition of the arm and suppuration in the left axilla, but apparently she was not then suffering from erysipelas.

(iii.) On the 19th day after vaccination she was again seen by a medical man, and was then found to be suffering from erysipelas.

(iv.) The second child vaccinated from the same source as the deceased and at the same time did not contract erysipelas, and her vaccination pursued a normal and healthy course.

ARTHUR PEARSON LUFF, M.D.

CASE 214, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of H. J. K.: report to the Commission of Dr. Theodore Dyke Acland.

Vaccination. H. J. K., of ——, was vaccinated by Dr. F., Public Vaccinator, on the 9th November 1892.

Death. 27th December 1892.

Certified cause. "Generalised vaccinia."

Certified by. Dr. F.

Source of lymph. One of six tubes supplied to the National Vaccine Establishment by Dr. G., of M——, numbered 341. Further details as to the origin of the lymph are given at the end of this report.

Co-vaccinees. Three: Nos. 461, 463, and 464 in the register. I have seen these children. Vaccination was normal in all, without glandular swelling, eruption, or other complication.

At the time of my visit on the 27th December, 49 days after vaccination, their arms were well and the scars did not present any abnormal appearance. Of these three children, one, G., No. 464, of ——, was vaccinated twice; on the first occasion unsuccessfully, on the second occasion vaccination was normal. It is believed that the first vaccination was performed with the National Vaccine Establishment lymph, but I was unable to ascertain for certain the source of lymph for the second and successful vaccination.

Four tubes of the same lymph were supplied to three other practitioners:

One tube to Mr. J. W. R., of ——, who writes January 6th, 1893, "All the insertions with the lymph supplied by "the National Vaccine Establishment on the 31st October "were unsuccessful. Before using this lymph I had "vaccinated the same child twice previously, once with "calf lymph, once with humanized, in each case without "result. At the third failure I returned the case as in-"susceptible."

Two tubes to Mr. R. M. T., of——, who writes that there were "no local manifestations whatever of inoculation. "The scratches died out in about three days."

One tube to Dr. R. G. P., of——, who vaccinated a child successfully and without any complication.

Sub-vaccinees. Three: Nos. 471 to 473 in the register. I have seen these children; vaccination pursued a normal course in all without complication.

One child C., of ——, No. 500 in the register, fourth remove from H. J. K., who was vaccinated on the 7th December, with the same strain of lymph, presented on the 21st December, 14 days after vaccination, four large bullous pocks surrounded by 12 supplementary vesicles. There was no ulceration and no discharge from any of them, and the areola was beginning to subside. There was no rash on the child's body. No further complication occurred and the child subsequently did well.

Method of vaccination. As far as I could ascertain unexceptionable. A special fixed lancet and needle are used, which are kept in a case by themselves and used for no other purpose. They are disinfected after each vaccination, and were in excellent order when I saw them on the 21st December.

Course of vaccination and illness. Dr. F., who communicated this case to the Medical Officer of the Local Government Board, states that the child came up for inspection on Wednesday, the 16th November, with four good, healthy-looking vesicles. He further adds: "I did not see the child H. J. K. again until

" the 23rd November (14th day), when the four vesicles " had amalgamated into one large sore covered with a " brownish green scab, and its margin surrounded with " innumerable small vesicles which eventually became " pustular. Under treatment, the scales disappeared, " leaving the arm red and inflamed. Some few days after " this a pock appeared on the back of the head. Other " pocks developed on the face and on the side of the nose, " others appeared on the left (the unvaccinated) arm and " leg. The eruption continued to spread, and eventually " 28 secondary pocks in all formed on various parts of the " body. The pocks were more or less circular in form with " slightly depressed centres, and were hard and shotty to " the touch."

At the date of my visit, the 21st December, 42 days after vaccination, there was at the point of inoculation a large irregular granulating surface extending nearly from the shoulder to the elbow, with serpiginous margins. The edge was raised, opaque, white, and closely resembled the periphery of a vaccine vesicle, on the seventh or eighth day. On the margin of this area there were one or two circular pocks, and the remains of others were visible, which had recently opened out and amalgamated with the general sore. The whole of the affected part had the appearance of being formed by peripheral extension, and fusion of contiguous foci of the morbid process, due to the gradual extension of the vaccination process from a central point by the development of fresh vesicles around the original pock; these gradually coalescing and forming one large ulcerating area. This process commenced about three weeks after vaccination. The central sore was granulating, clean, and healthy looking, not gangrenous, not sloughing, not excavated, but there was no scab and no appearance of any tendency to heal. Below the original point of vaccination there were (21st December) three circular vesicles with slightly inflamed bases. These were umbilicated with a small central scab. Similar pocks were widely scattered over the body. There were six on the face, three on the left arm, three on the right arm, three on the front of the left thigh, four on the right leg, one on the back of the head, one on the neck, and one behind the right ear. They varied much in size; the largest and oldest, that on the back of the head, was about the size of a two shilling piece, and was covered with a dark brown rather depressed scab, with no sign of inflammation round the base. There were others about the size of a shilling. The smallest was a little bigger than the head of a pin. This pock was first observed only 36 hours before I saw it, and then was raised and hard and distinctly vesicular, the fluid being turbid and rather opaque; it had some little inflammation round its base. Another pock about the size of a lentil had been observed for 48 hours. It had not at that time become umbilicated, and the contents were more opaque and of an ivory yellow colour. A third on the arm was about the size of a threepenny piece, distinctly umbilicated, and still more opaque in appearance. Those which had been in existence for some weeks, notably those on the face, had a dry dusky scab in the centre and a ring of inflammation surrounding them, giving the appearance of three distinct zones, the outer red and inflamed, the middle ivory yellow and consisting of the remains of the pock, the centre dusky brown and covered with a small scab. The vesicles which had originally formed upon the lips had been broken and destroyed, and were covered with dark scabs. The eruption was irregularly distributed and appeared to have no tendency to symmetrical arrangement. There were no sores upon the back nor upon any part which the child could not have reached by scratching. Two of the sores, one notably upon the abdomen and one on the thigh, had been rubbed, and the centre had the appearance of a finely granulating superficial ulceration surrounded by a raised ivory yellow ring, the granulations projecting through the opaque secretion which covered the base. The pocks were firm, with some slight thickening round the bases, but were not (49th day) indurated, and Dr. F. informs me that the points of inoculation did not at any time give the sensation of induration such as might be experienced in a primary syphilitic sore. The large sore at the point of vaccination discharged freely at first, the amount of discharge gradually lessening. The secondary pocks appear not to have discharged, and I was able to obtain only the minutest quantity of clear lymph by puncturing them.

Dr. F. had not noticed any pyrexia during the child's illness. He took the temperature once and it was normal. The axillary glands were not at any time inflamed nor indurated as far as Dr. F. knows.

Up to Christmas Day 1892 the child's condition was not such as to suggest a necessarily fatal termination. Dr. F. had been treating it with small doses of iodide of potassium and grey powder, the open sores being dressed with boracic ointment. Little change took place in the vesicles, except that the minute one, which appeared behind the right ear about the 21st December, did not come to maturity, but aborted and left no mark behind, and the scabs of the two on the right side of the face gradually became a little more detached, the scab increasing in size, and the ring of the pock drying up in proportion. Subsequent to the 21st December the child's restlessness and irritability increased, and it got little sleep, though it continued to take the breast well and without difficulty. On Christmas Day the mother first noticed a change for the worse, and the child ceased to take the breast well. It became more feeble, had difficulty in respiration, and died while asleep on the 27th December at 4 a.m.

I was not able to make a post-mortem examination. The vesicles on the 27th December, about 12 hours after death, had altered very much in appearance since I saw them on December 21st. The large one at the points of inoculation had dried up and was glazed, those on the right forearm were more covered with scabs, and the two on the right side of the face had almost entirely scabbed over, and the scabs apparently were becoming detached. As far as I could ascertain there were not and had not been any vesicles *in* the mouth or on the pharynx.

It may be convenient to give here a short chronological summary of the facts of the case:—

First week -	9th November	Vaccination with humanized lymph, 42nd remove from calf. [Of eight vaccinations by three vaccinators with lymph from same source, four were unsuccessful, but without complication or abnormal result.]
Second week	16th "	Inspection. Four healthy vesicles, to all appearance normal.
Third week -	23rd "	The four pocks coalesced into one; and became covered with dark brownish green scab. Innumerable secondary pocks, at first vesicular, formed round points of inoculation.
Fourth week	30th "	Secondary eruption becoming pustular, a large pock appeared on back of head, which eventually scabbed and dried up. Pocks appeared on face, arms, legs, abdomen, and thighs.
Fifth week -	7th December -	The supernumerary pocks at points of insertion became confluent; under treatment a large open sore formed.
Sixth week -	14th "	No improvement in child's condition.
	17th " -	Pulv. Hyd. c. Creta gr. ½ given three times a day with some improvement. Pock formed above inner angle of left orbit.
Seventh week	21st " -	Vesicle forming behind right ear; this aborted within 24 hours.
	25th " -	Child's condition worse. Mother's breast became inoculated from suckling the child. Pock ran a normal course; mother had not been re vaccinated.
Eighth week	27th " -	Death.

Contagiousness of the disease.

Mrs. K.'s breast became inoculated from her child. On the 6th January she had a well-developed vesicle on the breast an inch from the nipple resembling a healthy vaccination pock. This ran the ordinary course, and on the 17th January 1893, Dr. F. writes: " There is nothing but " a scabbing sore to be seen at present . . . . . the " woman had not been vaccinated since infancy; she says " herself that the pock passed through similar changes to " those on the face of the infant, did not spread, only one " appearing; the woman herself is in good health."

Treatment of vesicles.

Under medical advice the pocks were treated with boracic ointment.

Previous history.

Good. There are six other children in the family; one only has died, aged one year and eight months, of " croup." The family have been known to Dr. F. for 13 years, and he has never suspected any syphilitic taint. There is no tendency to tubercular disease, and all the other children have been vaccinated without any complication.

General and sanitary surroundings.

Nothing bearing upon the case could be ascertained. The child is not known to have been exposed to varicella or variola. No case of the latter is known either by Dr. F., Medical Officer of Health of ——, or by Dr. S., Medical Officer of Health of —— district, to have occurred during the preceding year.

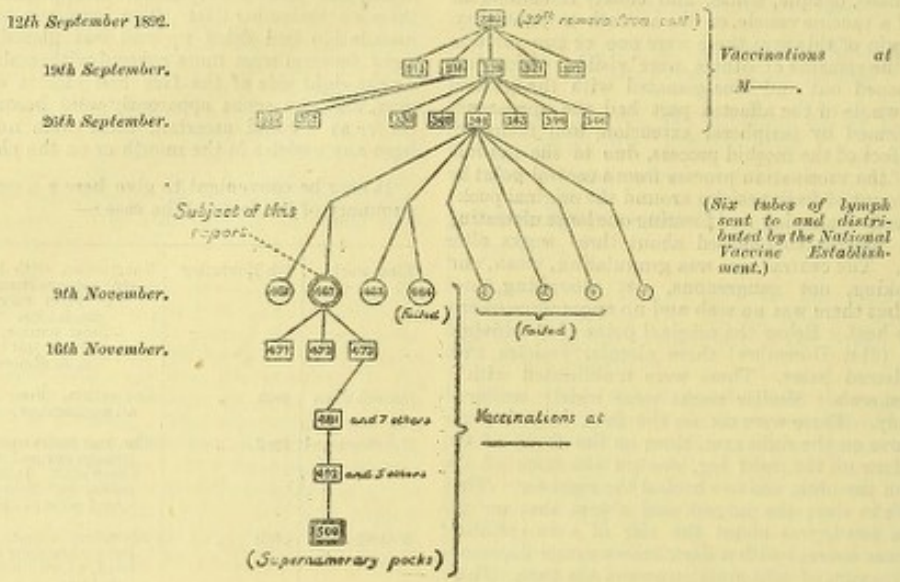
The case is one of generalised vaccinia. It is probable that infection occurred in two ways, one by auto-inoculation from the original vaccination wound, the other by general infection through the digestive tract, owing to the child constantly swallowing the lymph from the vesicles on its lips. Supposing that infection occurred by both these methods it would the more readily account for the fact that vesicles continued to develop at a date when, under ordinary circumstances, it might be supposed that immunity would have been secured against vaccinal infection; the vesicles upon the child's body at the time of its death being in various stages of development, from the earliest papule just discernible up to the almost completely healed sore with a dry adherent crust.

With regard to the above facts it should be noted that the dose of the vaccine virus was constantly increasing in quantity owing to the extension of the original pock on the arm and the development of new pocks on various parts of the body.

Pedigree of the lymph used.

The lymph supplied by the National Vaccine Establishment to Dr. F. on the 31st October 1892 had been obtained from Dr. G., of M——, who on the 26th September 1892 charged six tubes from a child, No. 341 in his register. The whole of the lymph collected from this child was sent to the National Vaccine Establishment and distributed by them. The result of the vaccinations with this batch of lymph is given above under "*co-vaccinees.*"

The following diagram shows the pedigree of the lymph. The children whose numbers in the register are given within a square were vaccinated direct from arm to arm; those whose numbers are given within a circle were vaccinated with lymph stored in tubes.



Dr. G., of M——, whose work, as far as I was able to judge, is done with the utmost care, and whose records are elaborately kept, has afforded me every possible assistance in making the inquiry. He states that on the 28th December *1891* he vaccinated four children, Nos. 219–22, with calf lymph obtained from the National Vaccine Establishment. Of these all but No. 221 were successful, and they served as the source of lymph for all the vaccinations of the year 1892 with one exception, that of a child vaccinated with half a tube of calf lymph which had been opened for a private case. No children were vaccinated from this child.

On the 3rd January 1893 I visited, with Dr. G.:—

(*a.*) H. J. K.'s vaccinifer, No. 341, and the co-vaccinees, Nos. 336, 340, 343, 344, and 346, of the vaccinifer. These six children were vaccinated on the 26th September 1892 from No. 320. (I also visited two children of a collateral branch vaccinated the same day with lymph from another source, No. 316.)

(*b.*) The vaccinifer of No. 341, No. 320, and the co-vaccinees, Nos. 315, 316, 321, and 322, of the vaccinifer. These five children were vaccinated on the 19th September 1892 from No. 293.

(*c.*) The vaccinifer of No. 320, No. 293. This child was vaccinated on the 12th September 1892.

The results were as follow:—

Vaccinations on the 26th September 1892.

No. 341, S. H., the vaccinifer of H. J. K. A typically healthy-looking child. Plump, with a clear skin, without any eruption upon her body. Her vaccination was normal, and there are four healthy scars. She is the youngest of two children, in neither of whom is there any sign of syphilis, congenital or acquired.

No. 336, A. M. Vaccination normal, four normal cicatrices. Child well.

No. 340, G. B. Vaccination normal. Four normal scars. Child convalescent from varicella (3rd January 1893), which has attacked all the family.

No. 343, A. D. Vaccination normal without complication. Child well.

No. 344, M. H. Vaccination had been once postponed. Child in feeble health. The arm was rubbed several times, and healing delayed. Beyond this there was no complication. There are three irregular scars with some slight papular eczema on the arm. An only child and illegitimate.

No. 346, W., aged three years. Vaccination normal. Four well-marked normal scars. Has always been delicate. At the time of my visit he was suffering from purulent ophthalmia. This child, his brother, and his father are all said to be consumptive. The family history is bad. There are four children living, two of whom are known to be in ill-health. Four have died, and the mother has had one still-born child and one miscarriage. One child, S., who has *not* been vaccinated, has within the last two or three years developed a coppery macular eruption with small branny scales on the surface specially abundant on the abdomen. There can be be little doubt that this is syphilitic. I was unable to discover any mucous tubercles round anus or mouth.

These children were all vaccinated from No. 320. Three children were vaccinated the same day arm to arm from another vaccinifer, No. 316; two of these three children were seen by me on the 3rd of January 1893, namely, Nos. 333 and 352.

No. 333, H. T. A small delicate child, but with clear skin and without any eruption. Vaccination normal. Three vesicles resulted from three insertions, and there are now three normal scars.

No. 352, J. C. A miserable, dirty, neglected child, with a filthy home. When I saw him, he was being nursed by a little brother. Three of the vesicles were rubbed on the eighth day, and there was a good deal of inflammation round the pocks. This inflammation was treated by the mother with fuller's earth and water, and the child subsequently suffered from an eruption on his body and head. The eruption on the head is impetigo, and, as far as can be gathered from the random and contradictory statements of the mother, the eruption on the body, which has left five or six small circular scars, was of the same nature. The only thing I was able to ascertain with certainty was that the eruption appeared very shortly after vaccination,

that the spots on the body were covered with crusts like those on the head, and that all ordinary precautions as to cleanliness and proper care of the vaccination sores were entirely neglected.

Vaccinations on 28th December.

No. 320, J. C., the vaccinifer of No. 341 (see above). A fine robust-looking child. Vaccination seems to have pursued a normal course, under very disadvantageous circumstances, as the child knocked the scabs off several times. There was, however, Mrs. C. informs me, practically no inflammation, no enlargement of glands, and no eruption. According to Dr. G.'s register there was no areola on the eighth day, but two of the vesicles had been rubbed. There are now four irregular cicatrices.

No. 315, T. M. Vaccination normal, and without complication. Three healthy cicatrices, not uniform in size.

No. 316, T. K. Vaccination said to have been normal. Three healthy and regular scars, the fourth has some hypertrophy of the centre of the cicatrix, which looks as if there had been considerable inflammation of the pock. The child is well and extremely dirty. He is the fourth child living; one only has died, of whooping-cough.

No. 321, A. C. Vaccination normal except that two vesicles only formed at four points of insertion. There is a note in the register that the arm bled freely at the time of vaccination. There are two healthy scars. This child is the youngest of seven living children, all of whom have been successfully vaccinated. One died in infancy. The house is filthy.

No. 332, J. K. Vaccination normal without complication of any kind; this child is and has always been delicate. He was vaccinated eight days after his father sickened with small-pox from which he suffered very severely. The father was the only member of two families living in the same house, numbering eight in all, who had not been vaccinated, and he was the only one who suffered from small-pox.

Vaccination on 12th December.

No. 293, E. R., the vaccinifer of No. 320 (see above). Vaccination normal and without complication. Four typically good scars. The first and only child. Quite well when seen by me the 3rd January 1893.

Summary as to lymph.

It will be seen from the above that in none of the vaccinifers in the direct line for three generations previous to H. J. K. the subject of this report (nor for three generations subsequent to him, see diagram given on page 404) did vaccination show any departure from the usual course. In No. 500, the fourth remove from H. J. K., at ——, supplementary vesicles developed, but no further complication occurred. On the other hand it should be noted that of the eight vaccinations performed with lymph taken from No. 341, and stored in tubes, only three (Nos. 461, 463, and f on the diagram) were successful; in four (No. 464, and c, d, and e) no result followed vaccination; and No. 462 is the subject of this report.

THEODORE DYKE ACLAND, M.D.

CASE 215, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of J. W. B. L.: report to the Commission of Dr. Arthur Pearson Luff.

In December 1892 I was requested by the Commission to investigate the circumstances attending the death of J. W. B. L., late of ——, and the alleged connexion of the death with vaccination.

The entry in the register of the death of the child was to the effect that J. W. B., aged one month and twenty-one days, died on the 11th December 1892, the cause of death being certified by Mr. J. M. S., M.B., of ——, as "erythema; cellulitis of arm; convulsions." The local registrar in sending in the certificate of death added that the deceased had been recently vaccinated.

Upon inquiry I found that the actual name of the deceased child was J. W. B. L., and that he was the illegitimate child of a woman named L., who was at one time in service in London but whose parents reside at a village near ——. The mother was confined in —— Hospital, where the child was vaccinated before she left the hospital.

Dr. J. M. S. informed me that he was first asked to see the child about four or five weeks after its birth, when he found the child suffering from a very extensive erythematous rash, and also in a very emaciated condition; the left arm and hand were very much swollen, but the vaccination marks were healed. The erythema in his opinion was strongly indicative of a syphilitic taint. Dr. J. M. S. states that there is a strong feeling against vaccination in the locality, and that he did not consider that he had sufficient evidence to warrant him in stating on the death certificate that the illness was due to vaccination.

Vaccinifer and co-vaccinees.

Upon inquiry at —— Hospital I found that the deceased child was born there on the 23rd October 1892, and was vaccinated three days later from an infant, J. W. H. of ——. From the same infant and at the same time were vaccinated 17 other children. At the time that the mother of the deceased child left —— Hospital no complaint had been made to the medical officer about the vaccination nor was there any knowledge at the Hospital that the vaccination was otherwise than in a normal condition. The following are the names and addresses of the 17 children vaccinated from the same source as deceased:—

L. R. H.	- -	six days old	- of ——.
F. A. Y.	- -	,, ,, ,,	- ,, ——.
E. W. M.	- -	,, ,, ,,	- ,, ——.
W. G.	- -	,, ,, ,,	- ,, ——.
E. B. C.	- -	,, ,, ,,	- ,, ——.
R. M. E.	- -	five ,, ,,	- ,, ——.
H. M.	- -	,, ,, ,,	- ,, ——.
J. F. M.	- -	four ,, ,,	- ,, ——.
E. O. C–t.	- -	,, ,, ,,	- ,, ——.
M. H.	- -	,, ,, ,,	- ,, ——.
J. P.	- -	,, ,, ,,	- ,, ——.
J. M. B.	- -	three ,, ,,	- ,, ——.
M. H. A.	- -	,, ,, ,,	- ,, ——.
H. S.	- -	,, ,, ,,	- ,, ——.
H. C. T.	- -	,, ,, ,,	- ,, ——.
C. H. C.	- -	one ,, ,,	- ,, ——.
N. L—e.	- -	,, ,, ,,	- ,, ——.

The vaccinifer J. W. H. was a healthy child whose arm caused no trouble at any time and the vaccination ran a normal course. Of the 17 children vaccinated from the same vaccinifer as the deceased, I have been able to trace seven, but have failed to trace the remaining ten. The following seven are those that were found and examined:—

E. B. C., vaccination ran a perfectly normal course, leaving a cicatricial area ·714 square inch.

J. F. M., vaccination ran a perfectly normal course, leaving a cicatricial area of ·518 square inch.

M. H., vaccination ran a perfectly normal course, leaving a cicatricial area of ·588 square inch.

J. P., vaccination ran a perfectly normal course.

H. C. T., vaccination ran a perfectly normal course, leaving a cicatricial area of of 1·128 square inch.

N. L.–e., vaccination was at first attended with inflammation, but subsequently healed up well without any further complication.

Conclusion.

In my opinion the death of the child J. W. B. L. was not due to the use of impure lymph in the vaccination for the following reasons:—

(i.) The child when first seen by a medical man 34 days after vaccination was found with the vaccination marks healed but with an extensive erythematous rash upon the arm, which was ultimately diagnosed as cellulitis. In the opinion of the medical man the erythematous condition was strongly indicative of a syphiltic origin.

(ii.) As regards the 17 other children vaccinated from the same source as the deceased, no untoward occurrence has been heard of following their vaccination. Of the seventeen, seven have been traced and seen. In six out of the seven children vaccination pursued a perfectly normal course, and in the seventh case, although there was at one time some inflammation around the vaccination marks, the case was ultimately a successful vaccination, the child remaining healthy.

ARTHUR PEARSON LUFF, M.D.

Case 216, reported to the Commission by the Coroner.

Case of L. A.: report to the Commission of Dr. Theodore Dyke Acland.

Vaccination. L. A., of ——, was vaccinated by Mr. B., Public Vaccinator, on the 8th December 1892.

Death. 17th December 1892.

Inquest. 19th December 1892.

Verdict Coroner's jury. "The deceased died suddenly from convulsions, and "that death was due to natural causes."

Source of lymph. Direct from the arm of S. A. P., of ——.

Vaccinifer. A fine healthy-looking child in whom vaccination pursued a normal course without complication of any kind. At the time of my visit, 2nd January 1893, there were four healthy cicatrices without induration; one with a small healthy scab. S. A. P. is the only surviving child. Mrs. P. has been married five years, and has had one still-born child, but no miscarriages. She is a healthy-looking woman. The child was vaccinated with calf lymph procured from Dr. Renner.

Co-vaccinees. Four; two primary, and two secondary vaccinations.

(1.) S. C., No. 409 in the register. I was unable to see this child or her mother, as they were away. Mrs. P., the mother of the vaccinifer S. A. P., who lives next door but one, informed me that she knew the child well; that the vaccination was normal and without complication, and that the child was well.

(2.) F. P., No. 411, of ——. At the time of my visit, the 2nd January, three and a half weeks after vaccination, there were four sores at the point of inoculation. These were shallow and were covered with a light yellowish scab having a finely granular surface. The margin was well defined, slightly raised, of a dull pink colour, and with a very faint areola. The bases of the sores were firm, moderately indurated, but the induration was ill-defined, and not parchment like. There was a slight amount of thick purulent discharge, which was not and had not been offensive. There was said to have been considerable enlargement of the glands in the axilla. They were at that time small, firm, and not tender. There was no rash, no mucous tubercles round mouth or anus, or other evidence of syphilitic inheritance or infection, although the appearance of the ulcers, and the fact that they were unhealed nearly four weeks after vaccination, together with the thickening of the bases, made it impossible at the time to state with certainty that they were not syphilitic. It appeared, however, extremely probable that the condition of the ulcers and the delay in healing was due to extraneous and easily preventable causes, since at the time of my visit the points of inoculation were being rubbed by the sleeve of the child's dress, which was saturated and stiff with purulent discharge from the wounds. I requested Mr. L., who was attending another child in the house, to treat the wounds with a powder of zinc oxide and iodoform, and to see that they were protected from all mechanical injury, in order to ascertain whether the sores were of a simple or of a specific nature; and I requested him not to treat the child with any remedies which might be expected to influence the sores if of a syphilitic origin. Three weeks later Mr. L. wrote: "I have on the 48th day" (*i.e.*, after vaccination) "visited and inspected, and find the four places still not "healed, though slowly doing so. One seems to have a "slightly indurated margin with sharp edge. The centre "is quite smooth, bright red and glazed, exuding a thin "fluid which becomes yellow and forms after a few hours "a scab. The child does not seem to be suffering any "inconvenience." On the 24th March Mr. L. wrote again: "I visited the child F. P. at ——, and found all "four scars completely healed, no glandular swellings, "and no spots about the body, and the child apparently "in good health. As far as I can judge there was nothing "syphilitic in the case, that they were scars probably "altered by hereditary strumous taint, together with "filth. They appeared to heal by being kept clean and "dusted with powdered oxide of zinc." In the same house and in the same room there was a child ill, according to Mr. L. with adenitis of the neck, enlarged tonsils and pharyngitis (? diphtheria, T. D. A.); this child died on the *5th January* 1893. There was also another child suffering from impetigo which it was believed he contracted from a child living next door, who was suffering severely from the disease. Mrs. P., the mother of the child F. P., has five children living; one died during dentition.

(3.) *W. J.*, No. 438, a re-vaccination which pursued a normal course without any complication.

(4.) *F. J.*, No. 439, son of the above, also a re-vaccination; normal, without complication. He had, on the 2nd January 1893, three large normal cicatrices, and one much less defined than the others.

Sub-vaccinees. None.

Course of vaccination and illness. Mrs. A., the mother of the child, L. A., states that her child's arm began to inflame on the third day, and that by the eighth day, the 15th December the arm was much inflamed; the inflammation extending nearly round the arm at the point of inoculation. She further stated at the inquest that when Mr. B. examined the arm on the eighth day he said it was a "bad arm." Mr. B., who was not summoned to give evidence at the inquest, entirely denies this statement, and he is supported by his assistant, Mr. G., whom I have seen, and who states that he examined the arm carefully, and that the vesicles were so good and so healthy looking that he was much tempted to take lymph from them for further vaccinations, but that he did not do so on account of the miserable condition of the child. I was unable to obtain any definite information as to the subsequent course of the child's illness, beyond what was given by Mrs. A. at the inquest. This was to the effect that the day after inspection, the 16th December, the child had a convulsion; that shortly before six on the following morning she looked well and was laughing, but that she then had another convulsion and died.

Dr. R., who was summoned, did not arrive at the house until after the child was dead; he writes that he "saw the "vaccinated arm, and found four scabs; there was no "inflammation about the arm; the child was weakly "looking and very thin."

Treatment of vesicles. The vesicles, according to Mrs. A., the mother, were not rubbed, nor were the scabs injured. The arm was dressed with cold cream when it began to inflame.

Previous history. Mrs. A. stated at the inquest that the child had "been in good health, and had had no doctor." This was not true, as both she and her husband and Mrs. O., who lived in the house, subsequently admitted. The child from birth was small and ill-nourished. When she was three or four weeks old she had convulsions, according to Mrs. A., for which she was attended by Dr. R., who writes to me as follows: "I was called to see the same "child some months ago, they informed me it had been "having screaming fits. I believe it had only stomach-"ache." I was unable to obtain any more accurate information. Vaccination was postponed when the child was three months old by Mr. B., the cause assigned on the certificate which I have seen being eczema; it is dated the 6th October 1892.

Family history. Mother is a very delicate, feeble-looking woman, but, as far as I could ascertain, with no history of definite disease. Father looks healthy. L. A. was the only child. Mrs. A. had been married two years. Her first pregnancy resulted in a miscarriage.

General surroundings. Dirty.

Sanitary condition. Nothing of importance noted.

Method of vaccination. Mr. B. uses the ordinary lancet, which he says is washed and wiped after every vaccination.

Conclusion. I feel it to be my duty to direct attention to the manner in which the inquest was conducted. Neither the vaccinator, Mr. B., nor Mr. G., who inspected the child, nor Mr. R., who saw the child after death and had attended her previous to vaccination, were summoned as witnesses. The child's mother made statements which subsequent investigation have shown to be devoid of truth. No post-mortem examination was made, and no serious effort seems to have been made to ascertain the true cause of the child's death. What this was, cannot with any certainty be surmised from the evidence that I have been able to obtain. The fact, however, cannot be disregarded that the mother is unhealthy and had had one miscarriage; that this child is known to have been feeble when born, is stated by the mother to have suffered from convulsions when a month old, to have been sickly and to have suffered from eczema when she was three months old, at which time her vaccination was postponed. The child was also considered as unfit to act as vaccinifer to other children when she was

five months old. Further, Mr. B., Mr. G., and Mr. R., each of whom I saw separately, were unanimous in expression of the opinion that the vaccination vesicles did not present any appearance which would lead them to suppose that vaccination had pursued other than a normal course.

THEODORE DYKE ACLAND, M.D.

CASE 217, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of F. D.: report to the Commission of Dr. Arthur Pearson Luff.

In January 1893 I was requested by the Commission to investigate the circumstances attending the death of F. D., late of ——, and the alleged connexion of the death with vaccination.

The entry in the register of the death of the child was to the effect that F. D., aged nine months, died on the 9th December 1892, the cause of death being certified by Mr. E. A. J., M.R.C.S., of ——, as "blood-poisoning after "vaccination, one month; German measles, fourteen "days."

Mr. E. A. J. subsequently wrote as follows with reference to the case:—

"Dear Sir, 2nd January 1893.

"F. D., who was attended by me, was vaccinated "according to routine by the Vaccinator appointed for "the district. About 10 days or so afterwards, and after "it had been inspected by the Public Vaccinator, the arm "became inflamed and the vaccine sores, which had dried "up as usual, reopened, showing four sloughing ulcers. "The lymphatics became inflamed, the whole arm and "shoulder swelled, became œdematous, and threatened to "suppurate; by the use of hot fomentations and antiseptic "applications the swelling was reduced, but an erysipe-"latous condition remained, which affected in turn all the "surface of the trunk, opposite arm, and both legs; about "this time, fourteen days from the time the arm first "inflamed the child had German measles, in common with "the other children of the house. Aphthous spots appeared "in the mouth, and diarrhœa set in, which proved fatal in "a few days. I have no reason to doubt that the primary "cause of death was septicæmia *after* vaccination, but "whether the blood poisoning was due to impure lymph "or to causes originating in the constitutional condition "of the child, I cannot say. I am inclined to think the "vaccine pustules were led to take on the condition they "did by the effect of a chill from exposure to cold and "wet; a shield was not used. I have another child "under my care which I hope is recovering, with almost "the same symptoms, minus the German measles; this "is in a different Union, and was vaccinated by another "Public Vaccinator. In conclusion, I may say that I am "a strong believer in the efficacy of vaccination, and regret "that these unfortunate accidents should from time to "time arise to prejudice any further the public mind "against such a useful preventative of disease.

"I am, &c.,

"E. A. J.,

"To the Secretary, "M.R.C.S., Eng., &c., &c.

"Royal Vaccination Commission."

On proceeding to —— I interviewed Mr. E. A. J., who stated that he was called in to the deceased about 17 days after vaccination, when there was a redness around the vaccination spots and over the arm, pus forming in the vaccination places, enlargement of the glands of the axilla, cellulitis of the arm, and sloughing of the vaccination places following. Cellulitis then spread to the other side of the body and the back generally. After being called in, the child took German measles. To his knowledge there was at the time of the illness of the child a good deal of erysipelas and fever in the neighbourhood of —— where the child lived, and that part of the district generally was in a bad condition.

Dr. M., the Public Vaccinator, stated that the deceased was vaccinated from another child, A. L., of ——, and that two other children besides deceased were vaccinated from the same vaccinifer. He saw deceased on the seventh day after vaccination, when the arm was in a normal condition, and he vaccinated from her two twin children named A–y A. and A. A.

Vaccinifer. I next proceeded to inspect all these children. The vaccinifer A. L. is a healthy child, and the vaccination ran a perfectly normal course, there being four good cicatrices upon the arm.

Co-vaccinees. I next saw the two children who, in addition to the deceased, were vaccinated at the same time from the vaccinifer, viz., R. M., of ——, and H. R., of ——; they were both in a healthy condition, and the vaccination had in both run a perfectly normal course; the cicatrices in both cases looking quite healthy.

Sub-vaccinees. I next saw the twins, A—y A. and A. A., of ——, who were vaccinated from the arm of the deceased on the seventh day after her vaccination, and three weeks before her death. In both of them vaccination had run a perfectly normal course, and the places had entirely healed before the end of three weeks. The cicatrices in both children looked quite healthy and no complications had arisen in connexion with vaccination.

Sanitary surroundings. I lastly examined the sanitary condition of the premises occupied by the parents of the deceased at ——; the cottage was a clean one, and the privy about 50 feet in the rear of the house; adjoining the house-wall on one side was a small stable about 8 feet wide, for a donkey; and on the other side of this stable was a stagnant pool into which slops and other refuse were emptied; the well supplying drinking water being close to this pool.

Conclusion. In my opinion deceased died from the debility produced by an attack of erysipelas occurring from 16 to 17 days after vaccination, and also from an attack of German measles supervening 14 days later. The erysipelas poison was not, in my opinion, introduced at the time of vaccination in the vaccine virus, for the following reasons, viz.:—

(i.) The vaccinifer was a healthy child, and the two other children vaccinated at the same time from the same source remained healthy and their vaccinations did well.

(ii.) The two children vaccinated from the arm of the deceased on the seventh day after her vaccination remained perfectly well and their vaccinations ran perfectly normal courses; and

(iii.) The erysipelas in the deceased did not appear until the 16th or 17th day after vaccination.

ARTHUR PEARSON LUFF, M.D.

CASE 218, REPORTED TO THE COMMISSION BY THE MEDICAL ATTENDANT.

Case of S. T.: report to the Commission of Dr. Arthur Pearson Luff.

At the request of the Commission I have made an investigation into the circumstances attending the illness, occurring shortly after vaccination, of S. T., of ——.

In a letter of the 2nd January 1893 received by the Commission from Mr. E. A. J., M.R.C.S., of ——, in connexion with the case of the child F. D. of —— (Case 217), reference was made to another child, under Mr. E. A. J.'s care at the time, who was stated to have been suffering from symptoms very similar to those of F. D., but who lived in a different Union and had been vaccinated by another Public Vaccinator. Mr. E. A. J.'s letter will be found given in full in my report to the Commission on Case 217.

On the 2nd April, 1894 I proceeded to — — and I was informed by Mr. E. A. J. that the second child, the subject of this report, to whom he had referred in his letter of the 2nd January 1893, was named S. T. and lived at ——, that the child had recovered from her illness and was still alive, and that she had been vaccinated by Mr. E. M. K., Public Vaccinator for the —— district of the —— Union.

From Mr. E. M. K. I learned that S. T., aged five months, had been vaccinated by him at —— on the 19th October, 1892, from a large tube of calf lymph (Dr. Pissin's) obtained from Rebman, of Berners Street, and that at the same time and from the same tube the undermentioned seven children were also vaccinated:—

1. M. E. C. (4 months), of ——.
2. A. E. O. (5 months), of ——.
3. W. C. (7 months), of ——.
4. A. B. S. (6 months), of ——.
5. J. E. G. (5 months), of ——.
6. A. C. P. (8 months), of ——.
7. M. F. (4 months), of ——.

ccinifer. I first saw the child S. T., and ascertained that she had been vaccinated in three places on the left arm, all of which took; when inspected a week after vaccination the arm was in good condition, and all went well until 14 days after vaccination when erysipelas set in, starting from the vaccination places and spread to the back, both arms, and legs. At the time of the attack there was a privy and cesspool close to the cottage; the cesspool had not been emptied for many months, and the smell from it was distinctly noticeable at times in the cottage. The child eventually made a good recovery, and when seen by me was in good health. Mr. E. A. J. informed me that at the time of the illness of the child there was a good deal of erysipelas in the neighbourhood.

nitary rrounds gs.

-vacci- es. Of the seven children vaccinated from the same tube of calf lymph as that from which S. T. had been done, I was able to see and inspect five, viz., A. E. O., W. C., J. E. G., A. C. P., and M. F., in all of whom I found the vaccinations had run normal courses and had been attended with no bad results whatever. The two other children, M. E. C. and A. B. S., I was unable to see, owing to removals, although I made several attempts to find them; but from neighbours I ascertained that their vaccinations had been normal and unattended with any complications.

nclusion. The child S. T. undoubtedly suffered from an attack of erysipelas contracted after vaccination. The erysipelas poison was not, in my opinion, introduced with the calf lymph at the time of vaccination, for the following reasons:—

(i.) The erysipelas did not appear until the 14th day after vaccination.

(ii.) None of the seven other children vaccinated at the same time from the same tube of lymph contracted erysipelas.

The attack of erysipelas was probably due to the unsanitary surroundings of the cottage in which the child lived.

ARTHUR PEARSON LUFF, M.D.

CASE 219, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of M. B.: report to the Commission of Dr. Arthur Pearson Luff.

In January 1893 I was requested by the Commission to investigate the circumstances attending the illness, occurring shortly after vaccination, of an infant M.B., of ——.

A letter, dated the 29th December 1892, had been received by the National Vaccine Establishment from Dr. J. K. of ——, to the effect that he had vaccinated a baby with calf lymph; that as he had already informed the Establishment the vaccination had been successful in one out of four insertions; but that since then he had been in constant attendance on the child for an erythematous condition of the vaccinated arm, which had extended to the other arm and the upper part of the body; and that he had had grave doubts at one time whether the child would recover, and considered that it was still in danger.

From information furnished by Mr. A. B. Farn of the National Vaccine Establishment, it appeared that on the 1st December 1892 twelve points were received by the Establishment from calf No. — and all of them were distributed on the 8th December. Two of the twelve points were sent by Dr. J. K., who on the 17th December had reported as follows:—"December 9th. Two primary "vaccinations, four insertions each. One had only one "very small vesicle; other failed."

On the 3rd January 1893 I proceeded to —— and went with Dr. J. K. to see the child M. B., who had been vaccinated on the 9th December 1892. The child was, in my opinion, undoubtedly suffering from erysipelas of both arms, face, and body. One of the vaccination marks had not closed, but presented a fairly healthy appearance. The glands in the left axilla were enlarged. The child appeared to be recovering from her illness, and in the opinion of Dr. J. K. she was at that time in a fair way towards recovery.

nitary rrounds gs. The sanitary condition of the house was good, and the child had always been kept in a very cleanly condition and was well cared for; the social position of the parents being fairly good.

On inquiry I could not ascertain that any cases of erysipelas had occurred in the neighbourhood or amongst any persons who had been brought in contact with the child.

Sub-vaccinee. Dr. J. K. informed me that one child had been vaccinated from M. B.; this child T. B. I next saw and found to be in a healthy condition, the vaccination having pursued a normal course. This child was vaccinated from M. B. on the 16th December (the seventh day after vaccination). The erysipelatous inflammation first appeared on M. B.'s arm about the 14th day after vaccination.

Conclusion The case was one of erysipelas arising after vaccination, the erysipelatous virus no doubt gaining access to the system of the child through the vaccination sores. In my opinion the erysipelatous poison was not inoculated with and at the same time as the vaccine virus, for the following reasons:—

(i.) A second child was vaccinated from the same tube of calf lymph and at the same time as M. B.; this second child had no erysipelas, and in fact its vaccination did not take.

(ii.) A child T. B. was vaccinated from M. B. on the seventh day after her vaccination; this child did not get erysipelas, and the vaccination pursued a normal course.

(iii.) Erysipelas did not appear on M. B.'s arms till about the 14th day after vaccination.

ARTHUR PEARSON LUFF, M.D.

CASE 220, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of E. S.: report to the Commission of Dr. Arthur Pearson Luff.

In January 1893 I was requested by the Commission to investigate the circumstances attending the death of E. S., late of ——, and the alleged connexion of the death with vaccination.

The entry in the register of the death of the child was to the effect that E. S., aged four months, died on the 3rd January 1893, the cause of death being certified by Dr. P. S. O., of ——, as "erysipelas (post vaccination); convulsions."

On the 6th January 1893 I proceeded to —— and I first went and examined the body of the deceased, which was that of a well-nourished child, four months of age. Upon the left arm there were four vaccination marks which had almost entirely healed, and looked in a fairly healthy condition; the skin on the left arm especially, and to a lesser extent on the right arm and trunk, was in a tumefied condition with peeling of the epidermis in places, and presented the appearances which one would expect to find in the dead body after severe erysipelas or cellulitis. The glands in the left axilla were slightly enlarged; there was no evidence of suppuration anywhere.

Mrs. M. E. S., mother of the deceased, informed me that the child was born on the 31st August 1892, and was taken on the 29th November to be vaccinated. The vaccination was done by the Public Vaccinator, Mr. B. M., at the vaccination station at ——, the vaccination being done from another child. The deceased in her opinion was well and healthy at the time of vaccination. The child was taken, seven days after vaccination, to the Public Vaccinator, who described it as a successful result. The child went on well until 14 days after vaccination, when the left arm, hand, and wrist became inflamed and swollen, and the child vomited. The mother took her to Dr. P. S. O. Subsequently the right hand and wrist became affected in a similar manner to the left, and shortly before death occurred, convulsions supervened.

Dr. P. S. O. informed me that the child was seen by him for the first time on the 14th December—15 days after vaccination; she then had an erysipelatous inflammation and swelling on the left arm extending over the vaccination spots to the elbow, and which on the next day extended over the entire arm. The glands in the left axilla were swollen and tender. The erysipelas spread across the body and affected the right arm. Convulsions only occurred just before death. He considered it an undoubted case of erysipelas; he did not know of another case of erysipelas in the vicinity.

Mr. B. M., the Public Vaccinator, informed me that on the 29th November 1892, he vaccinated from a child E. S——y, of ——, the following three patients, viz., E. S., the deceased; M. C., servant in ——, and M. S., also a servant in ——. The three were seen by him seven days after vaccination, when they were all passed as successful cases, the vaccination in every case pursuing a perfectly normal course. The vaccinifer E. S——y was vaccinated from calf lymph.

Vaccinifer and co-vaccinees.

I then went to see E. S——y., M. C., and M. S. I found them all to be healthy subjects, the vaccination marks looking perfectly normal and healthy. Both M. C. and M. S., who were vaccinated at the same time and from the same source as the deceased child, informed me that the vaccination in both their cases took well, but that they suffered no inconvenience from it, beyond that usually experienced with ordinary vaccination.

Sanitary surroundings.

I also made a careful examination of the sanitary conditions of the house of the parents of the deceased. The house is a small and ill-ventilated one, with a small yard at the back, in which are situated three privies, which are in the common use of the occupants of several houses opening into the yard. These privies had large metal receptacles for fecal matter, which were emptied about once a week. The three privies are situated about from 8 to 10 ft. from the door and window of the room in which the deceased child passed most of her existence, and a distinct smell from these privies was noticeable about the yard. There was an open gully in the yard for carrying off slops and surface-water, but this was efficiently trapped.

Conclusion.

The deceased child, in my opinion, died from erysipelas. This, in my opinion, was not directly due to vaccination, for the following reasons, viz.:—

(i.) On account of the lateness of the period at which the erysipelas appeared after vaccination.

(ii.) On account of the healthy condition of the vaccinifer.

(iii.) On account of the fact that the two other persons vaccinated from the same vaccinifer did not develop erysipelas, and that vaccination in them pursued a normal course.

The erysipelas may probably have been caused by the defective sanitary arrangements in existence in the house where the child lived. On careful inquiry I could hear of no cases of erysipelas in the vicinity nor amongst any persons who had been brought into contact with the deceased child.

ARTHUR PEARSON LUFF, M.D.

CASE 221, REPORTED TO THE COMMISSION BY THE CORONER.

Case of H. A.: report to the Commission of Dr. Arthur Pearson Luff.

On the 9th January 1893, at the request of the Commission, I proceeded to ——, and on the 10th January attended the Coroner's inquest touching the death of H. A., aged five months, who died on the 6th January, 1893. A communication had previously been received by the Commission from the Coroner to the effect that he had been informed of the death of H. A. from blood-poisoning after vaccination; that the medical man in attendance on the case had informed him privately that it was the worst case he ever came across, but he was not the vaccinator; that he had instructed the police surgeon, Dr. W., to make a post-mortem examination; and that the inquest would be held on the 10th January.

I first inspected the body of the deceased (for account see below), and then attended the inquest when the following evidence was given:—

Mrs. J. A., of ——, the mother of the deceased, stated that she took the child to Dr. G. R. W. on the 15th December to be vaccinated. The vaccination went on well up to the time that the child was taken again to Dr. G. R. W., on the 22nd December (seven days later), when Dr. G. R. W. told her to apply bread poultices to the arm.

In answer to a question put by me, she said that during the seven days following vaccination the arm was in a more inflamed condition than during the corresponding periods of vaccination with her other children. In addition to applying bread poultices she applied linseed poulticed of her own accord, and on the 25th December she obtained from a herbalist some slippery Elm Bark, which she made into a paste with milk, and put on over the inflamed area and vaccination spots. Later on, she applied fuller's earth and some preparation of camomile to the arm, up to the time that Dr. L. was called in.

Dr. G. R. W. stated that he vaccinated deceased on the 15th December from a tube of Dr. Renner's calf-lymph. On the 22nd December, seven days later, his father saw the child. He saw the child again on the 27th December, 12 days after vaccination; she was then suffering from cellulo-cutaneous or phlegmonous erysipelas, which extended all over the vaccinated arm, and over the left half of the thorax down to the umbilicus. He ordered the application to the arm of a solution of biniodide of mercury, and perchloride of iron to be given internally; but on calling the next day he found that the mother had discontinued the use of the application and medicine he had ordered, and was treating the arm her own way with fuller's earth and other substances. On that account he withdrew from attendance on the child. He vaccinated the deceased from a tube of lymph obtained from Messrs. C., J. and W., Wholesale Druggists, of ——, who were agents for Dr. Renner's lymph; two other children were vaccinated at the same time, but only one of these was vaccinated from the same tube as deceased. His father saw the two other children on the eighth day after vaccination; they were then well, and he had not heard of them since.

Dr. L., the medical man who attended the deceased, stated that he was first called in to the deceased on the 30th December 1892 (15 days after vaccination). The child was then in a state of high fever, the left arm swollen and œdematous; the left side of the thorax was also swollen and œdematous; and there was suppuration from two of the vaccination marks. He attended the child up to the time of her death on the 6th January, 1893 (23 days after vaccination). The cause of death, in his opinion, was erysipelas from blood poisoning.

In answer to questions put by me, Dr. L. stated that he did not take the temperature of the child, and that the deceased did not suffer from vomiting, diarrhœa, or convulsions. He considered that the erysipelas was caught from the vaccination spots, not necessarily through the medium of the vaccine virus.

In answer to a question put by Mr. H. (solicitor, representing Dr. G. R. W.), he said that he would have expected that erysipelas, if introduced with vaccine virus, would have shown itself before the eighth day after vaccination.

Dr. W., Medical Officer of Health and Police Surgeon for ——, stated that he made a post-mortem examination of the deceased on the 9th January. He found the left arm swollen, and thickening of the skin of the thorax, abdomen, and vulva. There were two vaccination marks on the left arm, and an abscess on the back of the left hand, and a sinus two inches above and at the back of the left elbow. On cutting into the left arm pus was found from the hand to above the elbow, beneath the skin, and between the muscles. In the lower lobe of the left lung there was a patch of pneumonia. The other viscera were healthy. The pneumonia, in his opinion, was probably septic in origin. The cause of death, in his opinion, was from the inflammation of the left arm. He considered that the inflammation had originated in the wounds caused by vaccination, not necessarily at the time of vaccination. The two vaccination marks were each about half an inch in diameter. There was no attempt at healing, no sloughing, no gangrene at the edge of the marks, no undermining of the skin around them, no enlargement of the left axillary gland, and no abscess in the left axilla. He should describe the disease from which the child died as suppurative cellulitis, but he could not say from the post-mortem examination whether it was erysipelatous in its nature or not.

Verdict of Coroner's jury.

The verdict was to the effect that the deceased died from phlegmonous erysipelas arising from vaccination.

I inspected the body of the deceased. The child had been vaccinated on the left arm in two places only. The condition of these places, and of the arm and body of the child, were such as described in Dr. W.'s evidence. There had evidently been deep and considerable suppurative cellulitis of the left arm.

Sanitary surroundings.

I then proceeded to make an inspection of the sanitary condition of the house in which the parents of the child

lived. It was a well-built stone house, with a w.c. away from the house, efficiently trapped and with an excellent flush of water. There was one sink within the house, which led into the drain, and which was efficiently trapped and the trap ventilated. I should describe the sanitary conditions of the house as very good.

Co-vaccinees.

On examining the vaccination records I found two children, who apparently had been vaccinated by Dr. G. R. W. on the same day as the deceased, viz., J. W. and J. H., one of whom Dr. G. R. W. stated had been vaccinated from the same tube of lymph as the deceased, but which one he did not know. Both of these were seen and examined. J. W. was in a perfectly healthy condition, and the vaccination had run a normal course. With regard to the second child, J. H., the parents stated that he was vaccinated on the 22nd December, and not on the 15th December, *i.e.*, a week later than the vaccination of the deceased. On further inquiry I could not find any information concerning the second child stated to have been vaccinated the same time as the deceased, nor could Dr. G. R. W., the vaccinator, give me any assistance on this point. It is, therefore, doubtful whether the child J. W. who was seen, was vaccinated from the same tube of calf lymph as deceased, or from the second tube.

I next proceeded to Messrs. C. J. and W., from whom Dr. G. R. W. purchased two tubes of calf lymph, on or about the 8th December. They informed me that they were the local agents for Dr. Renner's lymph, and that it was the only kind supplied by them; that the tubes purchased by Dr. G. R. W. were from a batch of tubes received on the 23rd November, 1892, from Dr. Renner, the number attached by Dr. Renner to the tubes being No. ——. As I considered it desirable to have a record of the results of the vaccinations done with the lymph from the calf from which the contents of the tube used to vaccinate deceased were taken, Dr. Renner at my request sent a circular letter (accompanied with a stamped and directed envelope) to each of the medical men who had been supplied with lymph from the calf in question. The letter, which was a similar one to that used in the inquiry which I conducted at the request of the Commission in the case of the child E. G. C., of —— (Case 208), was as follows:—

DEAR SIR, February, 1893.

I HAVE been requested to furnish the results from a batch of calf lymph in an inquiry which is to be placed before the Royal Commission on Vaccination.

On November —— I supplied you with —— tubes from the source in question, and I shall be much obliged if you will kindly fill in the circular on other side and return it at your early convenience, for which purpose I beg to enclose stamped and directed envelope.

I am, etc.,
C. RENNER.

Questions to be answered.

(1.) Number of vaccinations?
(2.) Whether successful?
(3.) Whether any inflammation?
(4.) Whether followed by suppuration?
(5.) Whether followed by ulceration?
(6.) Whether followed by rash?
(7.) Whether followed by other complication?

To this circular replies were received from 346 medical men, giving the results of 1,114 vaccinations performed with lymph taken from the same calf as that with which H. A. was vaccinated, and the following is a condensed summary of the results so supplied:—

Questions.	Answers.
1. Number of vaccinations.	1,114.
2. Whether successful.	1,085 cases successful. 29 cases did not take.
3. Whether any inflammation.	1,085 cases. No inflammation. 29 „ Inflammation. Details as to cases of inflammation: 14 cases slight; 3 „ considerable; 1 case rather excessive; 3 cases stated to be due to friction.
4. Whether followed by suppuration.	1,106 cases. No suppuration. 5 „ Slight „ 3 „ Suppuration.
5. Whether followed by ulceration.	1,101 cases. No ulceration. 8 „ Slight „ 5 „ Ulceration: in two cases stated to be due to friction.
6. Whether followed by rash.	1,100 cases. No rash. 14 „ Some rash. Details as to nature of the rashes: 1 case. Pruritus eight weeks after vaccination. 1 case. Very slight papular eruption on ninth or tenth day, lasting three or four days. 1 case. Eczema on face and pustule on little finger, resulting in ulceration and loss of nail. 3 cases. Slight rash about eighth day on hands and feet. 1 case. Varicella on seventh day. 2 cases. Slight rash for one or two days. 1 case. Measly rash on sixth day, passing off without desquamation. 1 case. A few spots around the vesicles.
7. Whether followed by other complication.	1,160 cases. No complication. 5 „ Complication: in four of these cases the complication consisted of inflammation of the axillary glands lasting for some time, and extreme debility. The fifth case was erysipelas (see below).

The case of erysipelas mentioned in the above table occurred in the practice of Dr. J. R. P., who sent the following account of it to Dr. Renner:—"I feel that "the accompanying report requires a little explanation, "more especially as with this one exception I have had "most excellent results from your lymph. In no case "since I have used it has it failed, and with this one "exception I have had no bad after effects at all. On "November 24th I vaccinated two children with a half "tube of your lymph, the first child healthy though "belonging to a family with a decided history of eczema "in childhood, took well and went through the normal "course. The second child—not very healthy—developed "erysipelas 14 days afterwards, but this in my opinion "was entirely due to the fact that it was not properly "looked after and *not kept clean*, and even when I had "drawn attention to the state of the arm the mother "continually allowed foul crusts to form and consequently "the child had several relapses, but eventually recovered. "The family history in this case is a very unhealthy one, "and on inquiry I found that an elder child had suffered "in exactly the same way after vaccination."

Conclusion.

The deceased child H. A. in my opinion undoubtedly died of the effects of suppurative cellulitis, the virus of which most probably gained access to the system through the vaccination wounds (on account perhaps of the dirty treatment of the arm that was employed), but not, in my opinion, at the time of the inoculation of the vaccine virus, for the following reasons:—

(i.) The child when seen on the seventh day after vaccination was not suffering from erysipelas.

(ii.) The diagnosis of erysipelas was not made till the 12th day after vaccination.

(iii.) Out of 1,114 cases of vaccination performed with the same batch of calf lymph as that used to vaccinate the deceased there was only one case of erysipelas, which occurred on the 14th day after vaccination, and was attributed by the medical man to want of cleanliness and improper treatment of the vaccination sores.

ARTHUR PEARSON LUFF, M.D.

Case 222, reported to the Commission by the Coroner.

Case of J. W. S.: report to the Commission of Dr. Arthur Pearson Luff.

On the 19th January 1893, at the request of the Commission, I proceeded to ——, and on the following day attended the Coroner's inquest touching the death of J. W. S., aged three months, late of ——, who died on the 16th January. A communication had previously been received by the Commission from the Coroner's officer to the effect that an inquest would be opened on the 20th January at —— on the body of J. W. S. whose death was stated by his father and mother to have been caused by vaccination, that deceased was found dead in bed, that he had been a healthy child, and that the vaccination had been performed by Dr. P. of ——.

Previous to the inquest I interviewed Dr. P., the vaccinator of the child who informed me that he vaccinated the deceased on the 11th January five days before the death occurred, and that he did not see the child alive afterwards; that he had examined the body of the child and found that the vaccinated arm had the usual healthy appearance found on the fourth day after vaccination; that he had seen the vaccinifer and the other children vaccinated from the same source as the deceased, and that they were all in a healthy condition.

Vaccinifer and other cases.

I next proceeded to visit the vaccinifer and the other children vaccinated from the same source as the deceased. The vaccinifer was the child of Mrs. C., of —— This child appeared to be perfectly healthy and the vaccination had run a normal course. The three children (in addition to the deceased) vaccinated from this source were seen by me and were all found to be in a healthy condition, the vaccination marks looking quite normal, healthy, and in the condition one would expect to find at the period that had elapsed since vaccination; they were:—M. E. H., aged three months; H. H., aged two months; and G. D., aged three months.

I next attended the inquest, and the following is a summary of the evidence given:—

Mrs. S., mother of the deceased, stated that the child was a healthy one, and had been fed from the breast only. He was vaccinated on the 11th January in four places by Dr. P. A little inflammation appeared on the 14th (three days after vaccination) around the spots, but on the next day this had almost entirely disappeared, and the arm looked quite well. On the 16th (5 days after vaccination) at 8 a.m. in the morning the child was alive and well; she gave him the breast and then put him back to bed, the child resting on his right side, but she did not cover the face. She then left the room, the father being left in bed with the child. One hour and three-quarters later she went up and then found the child dead.

J. S., the father of the deceased, stated that he last saw the child alive on the night of the 15th, that he got up at 8.30 on the morning of the 16th, but could not say then whether the child was dead or alive, although he removed the clothes from off the upper part of the child.

When examined by the Coroner he could not give any reason for removing the clothes from the upper part of the child, but persisted in stating that the child's face had not been covered by the clothes.

When asked why he had attributed death to vaccination he stated that his only reason was that he had seen a little frothy mucus issuing from the nose after death.

The post-mortem examination was made by Dr. R., of ——, who stated that the deceased was a well-nourished child, that there were four vaccination marks on the left arm. They were somewhat small in size, evidently of an early date and not fully developed, and such as he would have expected to find about five days after vaccination. There was no sign of inflammation around the vaccination marks, the lips and tongue were of a bluish colour, the tongue protruding slightly between the gums. The lungs contained on the outer surface a large number of very small hæmorrhages with patches of congestion internally; the spleen and the kidneys were much congested, and the brain was in an extremely congested state. The heart was empty on both sides. The other organs were healthy and normal. In his opinion the cause of death was suffocation, and he thought that it was caused rapidly.

Verdict of Coroner's ...

The verdict was to the effect that the deceased was found dead in bed, death being due to accidental suffocation. The Coroner, addressing the father of the deceased, told him that from the manner in which he had given his evidence he (the Coroner) had very little doubt but that the deceased had died from suffocation caused by the face being covered with the bedclothes, and that the father's attributing the cause of death to vaccination was merely an excuse to shield him from any possible blame that might attach to him in connexion with the death of the child.

Conclusion.

The death in this case was obviously due to suffocation, and was not in any way connected with vaccination; the suffocation occurring during the time that vaccination was running its normal course.

Arthur Pearson Luff, M.D.

Case 223, reported to the Commission by Dr. A. P. Luff.

Case of E. L.: report to the Commission of Dr. Arthur Pearson Luff.

While I was at —— on the 20th January 1893, investigating the case of J. W. S. (Case 222) for the Commission, another case of death occurring shortly after vaccination was reported to the Coroner, and by his kindness and courtesy the inquest was held on the same day, in order to enable me to investigate the circumstances attending the death.

The deceased child, E. L., aged four months, was vaccinated on the 9th January 1893, and on the 18th January (*i.e.*, nine days after vaccination) the child died in convulsions. The vaccination was performed by Dr. J. F., Public Vaccinator, of ——.

At the inquest the following evidence was given:—

E. L., of ——, the mother of the child, stated that the deceased was vaccinated on the 9th January from lymph in a glass tube. The child seemed to be going on well till the 17th January, all four places taking and looking well. About three weeks ago the deceased cut two lower teeth and she was cutting two more when she died. The child had been in the charge of Mrs. E. M. for the past two or three weeks.

The evidence of E. M., of ——, was to the effect that she had taken charge of the deceased since the 1st January. The child appeared to be healthy and was fed on condensed milk, bread, and porridge. Occasionally the child was irritable from teething before she was vaccinated, and became rather more irritable after the vaccination, and, in fact, seemed very much worried with her teeth. The arm did well up to the 16th January (seven days after vaccination), when the child was taken to Dr. J. F., who removed some matter. On the following day the arm became red but not swollen, the redness only being around the vaccination spots, and extending altogether over an area of 3 to 4 inches wide. She applied magnesia and water to the arm. On the 18th (nine days after vaccination) the child was better, but on the morning of that day she had three fits, in the last of which she died. Previous to death the child vomited several times but never had any diarrhœa.

The evidence of Dr. J. F., Public Vaccinator, of ——, was to the effect that he vaccinated the deceased on the 9th January from a tube of lymph taken from the arm of W. A. H. on the 19th December 1892. Four other children were vaccinated at the same time from the same lymph. All five children were seen by him on the 16th (seven days after vaccination). In all of them vaccination seemed normal, and they were all passed as successful.

The post-mortem examination was made by Dr. R., of ——, in my presence. In his evidence Dr. R. stated that the vaccinated arm looked quite normal, and in the condition that he would expect to find eight days after vaccination. There was no sign of swelling around the arm, no indication of erysipelas, and no sign of inflammation under the skin on cutting into the vaccination marks. The deceased had cut two of the lower teeth, and the lower gum was swollen, and two more teeth were about to come through the upper gum. Internally, all the organs were healthy and normal and the brain was pale. Judging from the history of the case and the absence of post-mortem sighs, he was of opinion that death was due to convulsions, caused, probably, by early teething, and that in his opinion death was not in any way due to vaccination.

Verdict of Coroner's jury. The verdict was to the effect that the deceased died from convulsions due to early teething.

Vaccinifer and co-vaccinees. The vaccinifer, W. A. H., was seen by me, and was found to be a healthy child, in whom vaccination had run a perfectly normal course. In addition to the deceased four other children had been vaccinated from this vaccinifer, viz.:—R. L. T., E. P., H. G. A., and H. H. H. At some trouble I managed to see all these children, and found that in all of them vaccination was pursuing a perfectly normal course.

Conclusion. In my opinion the death of the deceased was not connected with vaccination, but was due to convulsions caused by early teething, the child being only four months old and having already two teeth cut and two more about to be cut.

ARTHUR PEARSON LUFF, M.D.

CASE 224, REPORTED TO THE COMMISSION BY THE CORONER.

Case of C. C. C.: report to the Commission of Dr. Arthur Pearson Luff.

On the 22nd January 1893 I was requested by the Commission to attend the Coroner's inquest to be held on the following day touching the death of C. C. C., aged three months, late of ——, who died on the 21st January. A communication had previously been received by the Commission from the Coroner to the effect that an inquest would be opened on the 23rd January at —— on a child whose death had been attributed to vaccination.

As I was unable to go to this inquest myself—with the permission of the Chairman of the Commission—I asked Mr. Duncan Campbell, L.R.C.P. and M.R.C.S., to attend to take minutes of evidence and to make an inspection of the children, premises, &c.; and this report is in part based on notes made by him, and in part on a copy of the depositions taken by the Coroner at the inquest.

The Coroner stated that the case was one in which a rumour had got about that the child had died from vaccination, and that it had only been vaccinated 14 days previous to death. This rumour seemed to be a general one in the district in which the parents of the child lived.

Vaccinifer and co-vaccinees. Previous to the inquest the vaccinifer and the other children vaccinated from the same source as the deceased were seen and examined. The vaccinifer, M. A. T., 2½ months old, was a healthy child, and the vaccination had run a perfectly normal course. Four other children had been vaccinated from this child in addition to the deceased child C. C. C.; they were all seen and were all in a healthy condition, the vaccination pursuing a perfectly normal course in every case.

The body of the deceased was next inspected previous to the inquest. It was that of a well-nourished child with four medium sized scabs upon the left arm, which was in a perfectly healthy condition for the period after vaccination; there was no discolouration or suppuration around the scabs.

At the inquest L. C., the mother of the deceased, stated that the child was three months old at the time of his death; that he appeared to be a healthy child up to the 9th January 1893. He did not seem very well after vaccination; he was somewhat restless and cried at times. On the night of the 20th January 1893, she went to bed with her husband, between 10.30 and 10.45 p.m.; the child was in bed with them, and was lying on her left arm, her husband being on her right side. She gave him the breast, and he went to sleep then. At 6 o'clock the next morning her husband rose and went to work, when she thought the child was asleep; she went off to sleep again, and at 7.15, when she awoke, she found that the child was dead and becoming cold. She did not attribute the death of the child to vaccination. The child's life was insured, but only three weeks previously, so that they did not realise any insurance by his death.

Dr. M. stated that he was called in on the 21st January at 8 a.m. to see the body of the deceased. Post-mortem rigidity was then commencing in the arms, the surface of the body being slightly warm. A quantity of frothy mucus was issuing from the mouth and nose. He had made a post-mortem examination of the body, and found it to be a well-nourished and well-developed child. There were no marks of violence about it. There were four typical cicatrices or advanced vesicles after vaccination with no inflammatory redness or areolæ around them. As a Public Vaccinator he had never seen a more typical and healthy arm. On examining the heart and lungs he found them in the condition seen after death from asphyxia—viz., the right cavities were fully distended with blood; both lungs were very much congested, and the brain was also extremely congested. The abdominal organs were healthy. From the appearances of the lungs, heart, and brain he had come to the conclusion that death was caused by suffocation.

Verdict of Coroner's jury. The verdict was to the effect that the deceased died from accidental suffocation, and that there was not any connexion between vaccination and the child's death, either directly or indirectly.

ARTHUR PEARSON LUFF, M.D.

CASE 225, REPORTED TO THE COMMISSION BY THE CORONER.

Case of T. S.: report to the Commission of Dr. Arthur Pearson Luff.

On the 25th January 1893 I was requested by the Commission to attend the Coroner's inquest to be held on the following day touching the death of T. S., aged six months, late of ——, who died on the 23rd January. A communication had previously been received by the Commission from the Coroner to the effect that an inquest would be opened on the 26th January at —— on a child, T. S., aged six months, son of A. S., of ——, coal-miner, and stating that it had been reported to him that "deceased was put to bed about 2.30 p.m. on the 23rd instant by his mother, who at 5 p.m. on the same day went again to the bed and found deceased dead. The latter is said to have been a healthy child until he was vaccinated, which took place when he was three months old. Soon after vaccination sores broke out on deceased's head, and have continued to do so ever since, in addition to which he has suffered with a swollen neck. No medical man has been called in, but the mother says she has obtained one bottle of medicine and one box of salve. I may say that the parents do not allege that death has resulted through vaccination." The Coroner also stated that he had ordered a post-mortem examination to be made.

As I was unable to go to this inquest myself—with the permission of the Chairman of the Commission—I asked Mr. Duncan Campbell, L.R.C.P. and M.R.C.S., to attend to take notes at the inquest, and to make an inspection of the children, premises, &c.; and this report is in part based upon notes made by him, and in part upon the depositions taken by the Coroner at the inquest.

Previous to the inquest, Mrs. S., the mother of the deceased, was seen. She stated that the deceased was vaccinated on the 18th October 1892 (when three months old), that he was fairly healthy up to the time of vaccination, but rather weakly. On the seventh day after vaccination she applied a poultice to the vaccinated arm, as it was somewhat inflamed; she did not remember any lumps being present in the armpit. On the 14th day after vaccination it was much better, and on the 21st day was well. About four weeks after vaccination the mother of the child noticed a little eruption on the head, which spread to the forehead and to the back of the head. The glands of the right side of the neck became enlarged. On the 24th December 1892, she obtained an ointment and a bottle of medicine from Mr. H., a herbalist, and this was the only treatment the child had. She did not call in a medical man.

Sanitary surroundings. The sanitary arrangements of the house proved on inspection to be of a fairly satisfactory nature.

Vaccinifer. The deceased was vaccinated from lymph contained in a tube, which lymph had been removed five days previously from the arm of C. H., of ——. This child was interviewed, and found to be in a healthy condition, and her vaccination had run a perfectly normal course. The deceased was the only child vaccinated from this vaccinifer.

On inspecting the body of the deceased it was found to be that of a well-nourished child with four normal and healthy cicatrices, in the usual vaccination area on the left arm. There were enlarged glands in the left axilla, and the skin around the vaccination marks looked perfectly normal.

At the inquest, which was held on the 26th January 1893, the following evidence was given:—

Dr. C. M. stated that he did not attend deceased during life, but on the previous day he made a post-mortem examination; he found no outward marks of violence; the body was fairly well nourished; there was a slight eruption on the front and back of the upper part of the chest, and a crusted eruption on the head arising from eczema, which, in his opinion, arose naturally. Internally all the organs were healthy except the brain, which was in a highly congested state; the left side of the heart was filled with blood. The glands of the neck and below the ear on the right side were greatly enlarged and inflamed from the eruption on the head. On the left arm there were four marks as if from vaccination, which had gone on well in his opinion; there was no sign of inflammation. In his opinion vaccination had nothing to do with death, the actual cause of which was convulsions from congestion of the brain brought on by constitutional disturbance.

Mrs. S., the mother of the deceased, stated that the child was six months old; he was rather delicate, having been brought up partly by the breast and partly by hand, and three months ago he was vaccinated by Dr. W., and that a few weeks after vaccination an eruption broke out on the top of the head. On the 23rd January she put him to bed at 2.30 p.m., and about 4.40 p.m. the same afternoon she went up and found him dead in bed. She did not think that vaccination had anything to do with death. She did not notice anything peculiar after vaccination, except some inflammation of the arm on the seventh day; for which she applied a poultice, and which was better on the 14th day, and well on the 21st; the spots on the head did not appear until a few weeks afterwards.

The verdict was to the effect that the deceased died of convulsions from congestion of the brain brought on by constitutional disturbance.

In this case there was obviously no connexion between vaccination and death; the deceased had been vaccinated three months previously, and, with the exception of a little inflammation which appeared on the vaccinated arm seven days after vaccination, the vaccination had run a normal course. The eruption upon the head and neck did not appear until five or six weeks after vaccination, and was, from the appearances presented at the post-mortem examination, ordinary eczema with incrustations from the weeping surface.

ARTHUR PEARSON LUFF, M.D.

CASE 227 [SERIES], REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of L. E. J. and C. M. J.: report to the Commission of Dr. Theodore Dyke Acland.

Firstly, as to L. E. J. of ——.

On the 26th October 1892 by Dr. F. W. B., Public Vaccinator.

30th January 1893.

"Multiple abscesses following one week after vaccination, nine weeks; pneumonia, four days."

"Mr. E. B. Allen, M.R.C.S., House Physician, East London Hospital for Children, Shadwell.

Direct from the arm of R. S. of ——.

R. S. is a well-nourished, healthy-looking child. The youngest of a family of six, all of whom are living. The mother and the sister whom I saw are neither of them strong, but the conditions under which they are compelled to live are not conducive to sound health. Mrs. S. states that the child R. S. had been well since birth, that vaccination pursued a normal course without complication, and that the wounds healed well and quickly. There had been no rash, no enlargement or suppuration of the axillary glands, and no constitutional disturbance. At the time of my visit, on the 24th February 1893, the child was well; he had four normal healthy-looking cicatrices (two of which were too close together), and his skin was clear without eruption of any kind. As far as I could judge the child was a fitting one to have been selected as a vaccinifer.

None. *Co-vaccinees.*

One. C. M. J. (twin sister of L. E. J.), aged 10 months. (*See* below.) *Sub-vaccinees.*

For the first 10 days vaccination seems to have pursued a normal course; towards the end of the second week the arm became much inflamed, the axillary glands enlarged, and the surrounding tissues became hard and brawny. *Course of vaccination and illness.*

On the 2nd December, five weeks and two days after vaccination, the child was taken to the East London Children's Hospital and admitted under the care of Mr. Parker, with impetigo at the seat of vaccination and a swelling in the axilla. For the following notes I am indebted to Mr. Allen, the House Physician:—"On the "thoracic side of the right axilla there was a mass of "diffuse brawny induration, and over it the skin was "dusky, but no fluctuation could be detected. An "incision was made, the tissues were softened, but "only a drop of pus was found. During the next fort-"night the child was very ill, with high temperature, "some suppuration from wound, and on December 25th, "diarrhœa. Various applications were made to the "wound, and a counter opening was made. Under treat-"ment the original wound eventually healed, but a small "abscess formed on the buttock which was opened. "Several pustules subsequently formed on the body; both "the abscesses had healed and the pustules had dried up "five or six days before the child's death. During its "illness the infant had emaciated considerably, and on "January 24th, 1893, it was found to be suffering from "pneumonia from which it never rallied."

No post-mortem examination was made. On the 2nd February when I saw the child (after death), she had four vaccination scars, scaly, without induration, or any evidence that there had been severe inflammation round them. There was a scar in the axilla at the point where the abscess had been opened, and another on the buttock. The skin round anus was raw and eczematous, and there were a few scattered pustules on the chest.

Mrs. J., the mother, stated that no application was made to the vaccinated arm except under medical advice, and as far as she knows the scabs were not injured. *Treatment of vesicles.*

As far as I have been able to ascertain, vaccination was carefully performed. Dr. F. W. B. informs me that he is particular in the choice of vaccinifers, and in the cleanliness of his instruments. He examines every child, and marks in the vaccination register if he thinks it is not fit to act as vaccinifer. *Method of vaccination.*

Secondly, as to C. M. J., twin sister of L. E. J. *C. M. J.*

On the 2nd November 1892 by Dr. F. W. B., Public Vaccinator. *Vaccination.*

Direct from the arm of L. E. J. *Source of lymph.*

As to L. E. J., see above and below. *Vaccinifer.*

None. *Co-vaccinees.*

None. *Sub-vaccinees.*

C. M. J.'s vaccination, which had been postponed, was without complication, although the wounds were long in healing. There was no enlargement or inflammation of the axillary glands, and there was no eruption of any kind on the child's body until more than three months after vaccination. On the 2nd February 1893 the scars were normal without induration, and there was no evidence that the child had suffered in any way from vaccination. On the day mentioned the child was suffering from purulent ophthalmia, which Mrs. J., the mother, informed me was only of two or three days' duration, and for which no medical advice had been sought. Subsequently in a letter dated the 15th February 1893, Mr. J. H. Lynn stated to the Commission that this child had "a number "of sores on the face, shoulder and stomach which *have* "*the appearance of vaccine sores*, and as they seem likely "to continue, if not to grow worse, the mother having lost "the other from vaccination is much distressed about this "one." I saw the child for the second time two days later, on the 17th February, and found that the inner and lower vaccination scars had been irritated apparently by the sleeve which rubbed right across it, and that there was a minute eczematous scab on it, covering a small portion of the scar. The other scars had the appearance of ordinary recent cicatrices. There were a few small spots of eczema on the head and a minute abscess near one of *Course of vaccination and illness.*

them; there was also a very small patch of eczema on the abdomen. The eruption was simple in character and trivial in amount, and Mrs. J. herself attached very little importance to it.

L. E. J. and C. M. J.

As to both children:

Family history.

Nothing of importance was elicited from Mrs. J., but her statements are unreliable.

Previous history.

Mrs. J. informs me that the previous health of the children, L. E. J. and C. M. J., had been good: and the statement is further made in Mr. Lynn's letter to the Commission (presumably on her authority) that none of them (*i.e.*, neither parents nor children) had ever had any eruptions or skin trouble. This statement, however, is not correct. *C. M. J.* was taken to the East London Children's Hospital on the 21st June 1892, and attended until the 16th August. During this period she was under treatment for congenital syphilis, and on the 26th July a certificate was given by Mr. H. J. Campbell, M.D., Assistant Physician to the Hospital, postponing vaccination on the ground that she was suffering from that disease. Dr. Campbell informs me that the notes of the case are scanty, giving only the diagnosis, and the fact that the child had suffered from a rash on the buttocks for eight weeks previous to her first attendance; he adds that he "concludes from the scantiness of the notes that "the case was a well-marked one, as in doubtful cases "the notes taken are usually much fuller." *L. E. J.* received a similar certificate a week later from Dr. E. W. Hastings, who at that time was resident Medical Officer at the East London Children's Hospital, but I have not been able to trace the attendance of the child for treatment. From these facts it appears that both C. M. J. and L. E. J. were known to be suffering from congenital syphilis, and both their vaccinations were postponed in consequence. On the 2nd and on the 24th February 1893, when I examined C. M. J., there was no eruption on body, nor round anus nor mouth, suggestive of the presence of syphilitic taint.

General surroundings.

The surroundings of the whole block known as —— Buildings were filthily dirty, and the rooms occupied by Mrs. J. were no exception to the general rule. If dirt is capable of infecting a wound, ample possibility existed in the surroundings of the child for such infection. The sanitary condition was also extremely unsatisfactory. The sink, which is in the dwelling room, is cut off from the main drainage pipe only by a bell trap. This had been removed on the day of my visit (2nd February). There was, however, no offensive smell perceptible.

Conclusion.

The child L. E. J. died in consequence of suppuration of the axillary glands subsequent to vaccination; the pneumonia, to which she actually succumbed, being the final stage of her illness. There can be little doubt that the cellulitis and glandular abscess occurred as a direct consequence of the condition of the vaccination wounds. The inflammatory process, however it may have been set up, was very chronic, since only "a drop of pus" had formed in the axillary abscess by the commencement of the 16th week after vaccination, although the mother states that the vaccination pocks began to inflame towards the latter end of the second week. There does not seem to be any adequate ground for concluding that the cellulitis, which followed vaccination, was the direct result of the lymph used, or of the method of vaccination, seeing that the child was living for five weeks in dirty surroundings, which afforded ample opportunity for the vaccination wounds to become contaminated from some accidental and extraneous source; and, further, that no medical treatment was sought or adopted until three weeks after the arm is said to have shown signs of irritation. The fact also cannot be disregarded that the child had been for two months under treatment for congenital syphilis before her vaccination, and that her vaccination had in consequence been postponed.

Addendum.

I feel it to be my duty to call special attention to the fact that these two children were vaccinated, although vaccination had been postponed on account of their suffering from congenital syphilis, and that in neither case was the fact of the postponement or the reason of it brought before the vaccinator at the time that the vaccination was actually performed. A similar occurrence is noted in the case of E. M. (Case 202). No child was vaccinated from E. M. or C. M. J., and one only (her twin sister) from L. E. J., who was certified to have been syphilitic before vaccination. I have received the following communications; the first from the Public Vaccinator who vaccinated the children L. E. J. and C. M. J., and the second from the Vaccination Officer for the district in which the children lived:—

Dear Sir,

The certificates of postponement of vaccination by other medical men are not produced for my inspection when the children are brought up for vaccination, neither have I any instructions from the Local Government Board to have them laid before me. It might, as you say, be desirable to see these certificates, and the Vaccination Officer might be required to produce them, but, so far as my experience goes, this has not been done either in my case or that of my predecessor, Dr. K. We judge by the present condition of a child whether it is fit to be vaccinated, and are very careful to eliminate from those we use as vaccinifers children who show any existing signs of hereditary syphilis or other skin disease. From your examination it was proved that L. E. J. was vaccinated from a perfectly healthy child, and at the request of her parents I vaccinated her sister from her. If I had seen the cause of postponement I should have advised another vaccinifer, although she would probably have inherited a syphilitic taint from birth, and it could make but very little difference.

My experience goes to prove that no matter how healthy a vaccinifer may be, if the vaccince is the subject of some latent disease (as syphilis), the vaccination will probably cause manifestations of that disease. But, however careful Public Vaccinators may be, there will always be a certain risk run which the public must be prepared to incur in view of the protection afforded from small-pox.

Yours, etc.,

Dr. Acland. F. W. B.

Dear Sir,

Clause of the schedule to the General Order issued by the Local Government Board on the 31st October 1874 for regulation of Vaccination Officers deals with certificates of postponement of vaccination, and I have strictly carried out the instructions therein contained; there is no provision therein that I shall bring certificates of postponement under the notice of the Public Vaccinator, neither do I know of any other Order ordering me to do so. It must be understood that all the children in this district are not vaccinated by the Public Vaccinator, but that many are vaccinated by private medical men.

I am, etc.,

H. T. D.

THEODORE DYKE ACLAND, M.D.

CASE 228, REPORTED TO THE COMMISSION BY THE CORONER.

Case of W. C. Copy of the depositions taken at an Inquest held on the body of W. C., and of the verdict returned by the Jury.

Depositions of witnesses, produced, sworn, and examined, this 3rd day of February 1893, at ——, before me, S. S., Esquire, deputy for E. H., Esquire, Coroner of our Liege Lady the Queen, within the said City, touching the death of W. C., late of ——, son of James C., a self-actor minder, aged three months, there lying dead.

Jane C. saith:—

Deceased was my son. He was vaccinated a week ago last Wednesday. All four marks had taken, but they were small. Little bladders formed on each. He seemed to be no worse than usual on Tuesday, but he was very poorly from the vaccination and he had cut two teeth. His arm was not swollen, and there was no inflammation or redness on Tuesday. My husband went to bed about 11 p.m. and I followed shortly after, taking deceased with me. I gave him the breast about 4.45 a.m. and he sucked, and was sucking when I went to sleep. I next awoke about 5.15 a.m. and my husband picked up deceased, and we found he was dead. My husband and I were both sober. I have five children

living, and this is the first I have lost. I thought the vaccination had something to do with the cause of death, because he was not strong.

J. C.

James C. saith :—

Deceased was my son. I awoke about 5.20 a.m. on Wednesday, and found deceased dead in his mother's arm at her breast. I thought that vaccination had something to do with his death, because he twitched a good deal. His arm never looked bad or inflamed.

The mark × of J. C.

H. A., surgeon, of ——, saith :—

I have made an examination of the body of deceased. The body was well nourished, and there were four vaccination marks somewhat under the normal size. The skin over them had been bursted. The body was pale, except in the dependent parts which were purple. Internally, the blood was dark and fluid, there being no clot in any part. Both sides of the heart contained fluid dark blood. The lungs were gorged with dark fluid blood. The stomach contained a little mucus and digesting milk. The other organs were healthy and normal. The cause of death was slowly produced asphyxia. Vaccination could have had nothing to do with the cause of death. Deceased had cut two teeth.

H. A.

M. A. McC., of ——, confirms J. McK., Police Constable C ——.

Severally sworn before

S. S.,
Deputy Coroner.

Verdict.

Found lead in bed accidentally suffocated.

CASE 229, REPORTED TO THE COMMISSION BY MR. J. H. LYNN.

Case of S. S.: report to the Commission of Dr. Theodore Dyke Acland.

Vaccination. S. S., aged seven months, of ——, was vaccinated on the 1st December 1892 by Mr. B., L.R.C.P., privately, in two places.

Alleged injury. Abscess in the left axilla, and that "the vaccine vesicles "won't heal."

Result. Recovery.

Source of lymph. From arm of child, C. E. D., of ——.

Vaccinifer. C. E. D. is a healthy child vaccinated with calf lymph, in whom vaccination was without complication of any kind, although there was a considerable areola during the second week. The mother informs me that the arm was practically healed in a fortnight.

Re-vaccifer. Two.

(1.) Child of P. C. B., late of ——, now of ——. Vaccination was without complication of any kind, scars well and firmly healed. The child is now (16th April 1893) teething, and has a small abscess under its chin, which has only developed in the last two or three days, and has no connexion with vaccination.

(2.) W. A. S., of ——, an anæmic child in whom vaccination was without complication of any kind; there are now (15th April) two well-healed, healthy-looking cicatrices.

Lymph-vaccifer. None. Six tubes were filled; they were all carefully labelled with the name, date, and source of origin, &c., when I saw them (17th April). None of them had been used.

Course of vaccination and illness. When the child S. S. was taken to be inspected, Mr. B. informs me that the arm presented a typically healthy appearance. Towards the end of the second week the areola had formed and had entirely subsided, and the mother informs me that the child had no enlargement of glands, no rash, and appeared to be getting well. Towards the end of the week the mother sickened with rheumatic fever, the father had already been in bed for three weeks with pleurisy, and there was no one to mind the infant except a child of about 13 years of age, who was employed to nurse the baby, its mother, and its father. The mother was entirely unable to look after the infant herself, and although the grandmother and neighbours gave occasional help, there is no doubt that it was not efficiently cared for. Its young nurse could not manage the dressing, and although she gave it such attention as she could the infant was generally in bed with its sick parents, the mother continuing to suckle it all through her illness. Under these circumstances it is hardly to be wondered that the scabs were rubbed, and that some ulceration or discharge took place at the point of vaccination. A small abscess formed in the axilla, which Mrs. S. says was never larger than a filbert. It was opened by Mr. B., and very quickly healed, and as soon as the mother was able to get up and attend to the baby herself the arm healed rapidly and without difficulty. Mrs. S. believes that it was owing to her illness and the consequent neglect of the child that the vaccination did not pursue a normal course.

Present condition. There are now (16th April 1893) two thickened, slightly raised cicatrices, well and firmly healed. There is no enlargement of glands, no rash on the body. The child is typically healthy looking, plump, well-nourished, and sturdy.

Treatment of vesicles. Nominally the arm was treated under medical advice, but, as a matter of fact, it was constantly getting rubbed, partly owing to the child's being in the bed with its sick parents, and partly to the inefficiency of its nurse.

Previous history. Nothing of importance noted.

Family history. Nothing of importance noted.

Sanitary condition. Nothing of importance noted.

Conclusion. The child suffered from simple ulceration of the vaccination vesicles due to mechanical irritation of the wounds; the vaccination pursued a normal course until the child was deprived of the requisite care and attention by the illness of its mother.

THEODORE DYKE ACLAND, M.D.

CASE 230, REPORTED TO THE COMMISSION BY MR. J. H. LYNN.

Case of D. A. D.: report to the Commission of Dr. Arthur Pearson Luff.

In February 1893 I was requested by the Commission to investigate the circumstances attending the illness of D. A. D., aged 6½ months, of ——, and the alleged connexion of the illness with vaccination.

Mr. J. H. Lynn's letter of the 10th February 1893 informing the Commission of the case stated that "D. A. D. "was born July 26th, 1892, and vaccinated on the 25th "January 1893 by Dr. B., from a child's arm. She was "a delicate child, and at the time of presentation for "vaccination the mother called the doctor's attention to "her condition, and to some white blistery spots on the "chest. January 29th the arm began to blister, and the "child became very fidgety. On the morning of the 30th "there was a large blister as if scalded. It broke the "same night, and has been running ever since. It "enlarged and spread to the shoulder, and the 3rd Febru-"ary looked 'like a jelly,' and was accompanied with "much inflammation. When taken for inspection on the "1st February Dr. B. said '*this baby ought never to have* "'*been vaccinated.*' He gave an ointment, but the arm "got worse, and in the evening was shown to Dr. S., who "advised that it be taken to the Shadwell Hospital. This "was done and the arm was dressed there, and the mother "instructed to bring it again on Friday morning (the 3rd "February). Then three doctors inspected it, and the child "was retained. One of these doctors seemed incredulous "that the arm could have reached such condition as it "had in 10 days only from the operation. There has "been much inflammation from the 5th instant, and the "baby is failing in every way. (On the diet card brandy "is ordered.)

"Mrs. D., when taking her down on January 25th, "said, 'I don't suppose he'll do it, and he'll fill up the "'papers.' When she presented the child, Dr. B. re-"marked what a weakly child she was; the mother "replied, 'She has been ill for some time.' He asked

" what had been the matter, and she pointed out the " blisters on the chest, and said she did not think it was " fit for vaccination. When she took her baby for inspec- " tion on the 1st instant she reminded him of the con- " versation, and he said, 'Now I remember this is what " 'you called my attention to.' He also said that if he " had known whose child it was he would have given " different attention to her, and not have hurried her " through with the other children."

I proceeded to —— on the 13th February 1893 and first interviewed Dr. B., of ——, who informed me that at the time of vaccination his attention was not called by the mother to the condition of the child, nor did he see any spots upon the child at the time of vaccination; if he had he would not have vaccinated the child then. The mother informed me that the child had been to a hospital previously, but, as he understood, for bronchitis. His reason for saying on the 1st February, " This baby ought " never to have been vaccinated " was that, in his opinion, the mother should have told him that there was a rash on the child when she brought her in on the 25th January, or that she had previously suffered from the rash; the expression, " Now I remember this is what you called my " attention to " referred in his mind simply to the former illness of bronchitis, and to the weakly condition of the child. In his opinion it is not advisable to defer vaccination when the child has attained the age of six months simply because it is not a robust one. He considered D. A. D. a weakly child, but in a fit condition for vaccination, as she had reached the age of six months, and, as far as he knew, had no rash upon her, but he made a mark against the entry of the child's name in his vaccination book that she was not fit to be a vaccinifer on account solely of her weakly condition.

Vaccinifer. The vaccinifer of D. A. D. was L. C., of ——. This child I saw; she is a healthy child, and has no skin complaint, and the vaccination had run a perfectly normal course. D. A. D. was the only child vaccinated from this vaccinifer.

I then proceeded to the Shadwell Hospital, where the child D. A. D. was. On the neck, both front and back, there was an eruption of impetigo. The vaccinated arm had in the vaccinated area a sore place, from which the epidermal layer of the skin was removed, about 2½ inches long by 2 inches wide, and looking like the base of a blister; in this inflamed base the four vaccination marks were distinctly visible. There was one enlarged gland in the axilla of the vaccinated arm; this, I was informed by the medical superintendent, was rapidly subsiding. The child was admitted into the Shadwell Hospital on the 3rd February, and on the 4th February her temperature rose to 104° F., on account of the inflammation around the vaccination spots. On the opening of the blister and treatment of it with antiseptics, the temperature quickly fell to normal, and the child had been rapidly improving since then. There was no other rash upon the child, with the exception of a little eczema between the buttocks.

I next saw Mrs. D., the mother of the child, and she informed me that when the child was nine weeks old spots first came out upon the chest and neck; that she then attended Shadwell Hospital with the child as an out-patient for a month, and the spots disappeared completely under treatment; that there were no spots upon the child when she was taken to be vaccinated. The child was suckled by her the first five weeks of life, and since then had been reared on Nestlé's milk. With regard to the apparent discrepancies in her statement, as described in Mr. Lynn's letter, and the statement that Dr. B. made to me, Mrs. D. informed me that she did not call Dr. B.'s attention to some white blister spots on the chest, but told him that the child had had such spots previously, but that they were not there then.

Conclusion. From what I have been able to learn of the skin eruption that appeared on D. A. D. previous to vaccination I am of opinion that it was an attack of impetigo, which disappeared previous to vaccination and re-appeared after vaccination, but whether as the result of inoculation in the vaccine virus or not I am unable to say. The vaccinifer of D. A. D. was not suffering from impetigo when inspected by me, nor had she, according to the mother's and doctor's statement, previously suffered from any skin complaint. The child D. A. D. was making a good recovery when seen by me at the Shadwell Hospital.

Addendum. Since sending in this report the child D. A. D. has died in the Shadwell Hospital, and on the 9th March 1893, I attended the Coroner's inquest touching her death. The inquest was held by the original desire of the parents, although the Resident Medical Officer at Shadwell Hospital stated that he was prepared to give a certificate as to the cause of death. The day previous to the inquest the parents of the child desired him to give this certificate, and so prevent the holding of the inquest, but this the Coroner refused to assent to, as it was by the request of the parents that the inquest had originally been decided on.

Evidence was first given by Mrs. D., the mother of the child D. A. D., but nothing fresh was stated to what has been detailed in the previous report.

The evidence of Dr. Ernest E. Ware, Medical Officer to the Shadwell Hospital, was that he first saw the child on the 3rd February 1893, and that, according to the mother's statement, she had been vaccinated 10 days previously. In the vaccination area there was a large bleb containing turbid fluid, and the vaccination marks were buried at the base of this bleb. There were some sore places on the neck and back of the child; the ulcer, resulting from the bleb around the vaccination marks, healed quickly under treatment, but the sores on the neck and back remained, and similar sores broke out on other parts. On the 4th March last deceased contracted diarrhœa, which failed to yield to treatment, and she died on the 5th March from exhaustion. The condition of the sores on the neck and back was that of pustular eczema or impetigo. If the child had been suffering from pustular eczema before vaccination the operation of vaccination might bring out another attack of it, in his opinion.

Verdict of Coroner's jury. The verdict was to the effect that the child died from exhaustion produced by diarrhœa.

Conclusion. The death of the child appears to have been due to a severe attack of diarrhœa which occurred at a time when she was becoming convalescent; and no remarks in connexion with this case seem necessary beyond those already given.

ARTHUR PEARSON LUFF, M.D.

CASE 231, REPORTED TO THE COMMISSION BY MR. J. H. LYNN.

Case of G. T.: report to the Commission of Dr. Arthur Pearson Luff.

In February 1893, I was requested by the Commission to investigate the circumstances attending the illness of G. T., of ——, and the alleged connexion of the illness with vaccination.

Mr. J. H. Lynn's letter of the 15th February 1893, informing the Commission of the case stated that " G. T. " of ——, was born October 16th, 1892, and vaccinated " 25th January, 1893, by Dr. B. from child's arm. " When vaccinated it bled freely. In six days lumps " formed in the axilla and behind the ear and the *ear* " (not the lump) discharged. There was also mattery " discharge with the motions. When Dr. B. inspected it " on the eighth day he made no comment. The vaccine " sores were very moist, and he did not touch them. " About third day after vaccination the child became " feverish and ill, and went in frequent semi-faints. He " continued to get worse. On the 7th February was " taken to the Hospital Shadwell, where a lotion was " given, with directions that if improvement did not take " place he should be brought again on the 10th. On " the 9th the face and neck assumed a greenish hue as if " some dye had been applied. On the 10th was again taken " to hospital and *another* lotion was given. The vaccine " marks had grown larger, nearly touched one another, " and seemed like deep holes The arm changed colour and " was alternately blue, black, &c. Mrs. T. has abscess " on inner forearm near the wrist, from contact with child's " arm as it lay at night. The parents are healthy and " the other child, as was also this one until vaccination. " On the 13th instant the child was again taken to the " hospital, where it is now retained."

On writing to the Medical Superintendent of Shadwell Hospital on the 18th February, I ascertained that the child was then discharged from the hospital, having only been kept there four days.

I proceeded to —— on the 25th February 1893, and on the occasion of my visit to the hospital Mrs. T.

brought the child for my inspection. I found the child G. T. to be rather a weakly child with four vaccination marks upon the right arm, which were not deep, and which were healing fairly well. In the right axilla there was a gland which had been enlarged; the enlargement was subsiding and was then about the size of two peas. Below the right ear was an enlarged gland about the size of a pea. Neither of these glands were painful nor were they discharging, and were, in all probability, due to a little irritation arising from vaccination. There was no discharge from either ear; the mother informed me that on one day there had been a little discharge from the right ear. When the child was vaccinated the mother told me that there was a little blood drawn at the vaccination marks, but nothing excessive. About the seventh or eighth day after vaccination the child had a little diarrhœa, lasting during part of one day, and from the statement that she gave me as to the nature of the motions on that occasion, I should imagine that a little mucus was passed with the motions, but no pus or "mattery discharge," as stated in Mr. Lynn's letter. The mother stated that about the third day after vaccination the child was rather irritable. When I questioned her about the "frequent semi-faints" mentioned in Mr. Lynn's letter she informed me that what she meant by them was that the child was constantly drowsy on that day. With regard to the statement contained in Mr. Lynn's letter that on the 9th February "the "face and neck assumed a greenish hue as if some dye "had been applied," the mother informed me that on that day the face of the child was somewhat pallid, but she would not herself have described it as resembling the colour of a dye, and at the time that I saw the child the face was of a fairly healthy colour. With regard to the arm changing colour and becoming alternately blue, black, &c., the mother informed me that what she meant by that was that there was a reddish rash at one time around the vaccination marks, and that this rash faded away, the colour fading with it, but that she could not describe it as being either blue or black. With regard to the "bad abscess "on (Mrs. T.'s) inner forearm near the wrist, from con- "tact with child's arm as it lay at night" (as mentioned in Mr. Lynn's letter), Mrs. T. showed me upon the right forearm a small boil about ¼ to ½ of an inch long. She stated that the child only lay upon that arm one night, as it generally rested upon her left arm, and that the boil was there the next morning. In my opinion the boil was an ordinary one, and its appearance on the morning that the child had rested on that arm during the night was a mere coincidence.

From inquiries that I made at the hospital I ascertained that the child when first brought there was suffering from ordinary erythema on the vaccinated arm, with slight enlargement of the glands of the right axilla and behind the ear. As the temperature of the child became somewhat elevated (about 100°), he was admitted into the hospital under Mr. Dunn on the 13th February. The erythema around the vaccination marks rapidly subsided, and the child recovered in four days and was discharged from the hospital on 17th February.

On visiting Dr. B. (the vaccinator) he informed me that the child was brought to him on the eighth day after vaccination; it looked an ordinary successful vaccination, and was passed by him as such.

Vaccinifer. The vaccinifer was H. C., of ——, who was vaccinated with calf lymph received from the National Vaccine Establishment. I have seen H. C. She is a healthy-looking child, and her vaccination has run a perfectly normal course, and has not been attended with any abnormal circumstances or complications.

Co-vaccinees. From H. C., Dr. B. vaccinated on the 25th January 1893, three children, viz., G. T. (the child concerning whom this inquiry has been made), J. T. L., of ——, and E. J., of ——. I have seen both these children (J. T. L. and E. J.). They are both healthy-looking children, and in them vaccination has pursued a normal course and has not been attended by any complications.

Conclusion. In my opinion G. T. merely suffered for a few days during the vaccination period from the eruption resulting from a slight attack of erythema, as the result of which there was some slight glandular enlargement and diarrhœa for a day. The statements contained in Mr. Lynn's letter, in my opinion, give a very erroneous impression as to the actual events of the case, and Mrs. T., the mother of the child, informed me that she herself had had no intention of making any complaint concerning the vaccination, but that Mrs. D. (the mother of the child D. A. D., Case 230) came to her a week ago, and asked her whether she would make a complaint or statement about the vaccination to someone, and that a day or two afterwards a gentleman attended and took down the statement contained in Mr. Lynn's letter.

ARTHUR PEARSON LUFF, M.D.

CASE 232, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of E. J. H.: report to the Commission of Dr. Arthur Pearson Luff.

In February 1893 I was requested by the Commission to investigate the circumstances attending the death of E. J. H., late of ——, and the alleged connexion of the death with vaccination.

The entry in the register of the death of the child was to the effect that E. J. H., aged one month, died on the 11th February 1893, the cause of death being certified by Dr. T. W. P., of ——, as "bronchitis, five days; vaccination, nine days; convulsions, two days."

I subsequently received a letter from Dr. T. W. P. in answer to inquiries that I made of him, in which he informed me that he vaccinated deceased on the 4th February, and that two days later he was sent for to see the child, whom he found to be then suffering from bronchitis. She died from convulsions on the 11th February He did not think that the vaccination had anything to do with the cause of death, but as the operation had been done a few days before her fatal illness set in, he thought it was only right that it should be mentioned in the death certificate.

I proceeded to —— on the 5th April 1893 and first interviewed Dr. P., and he informed me that at the time of the death of the deceased the vaccination was pursuing its normal course, and was attended with no complications whatever; that the child developed bronchitis two days after vaccination, no doubt on account of the cold winds prevalent at that time; that the bronchitis got worse, and that the child finally died from that disease, and from convulsions which supervened two days before the fatal result.

The vaccinifer of the deceased was S. H., of ——; I saw this child, and found her to be a healthy child in whom the vaccination had run a perfectly normal course. *Vaccinifer.*

From this vaccinifer two other children were vaccinated in addition to the deceased and at the same time, viz., M. P. and W. P., both of ——; I saw both these children, and found that in both of them the vaccination had run a perfectly normal course. *Co-vaccinees.*

The death of the deceased was obviously not connected in any way with vaccination, the cause of death being bronchitis and convulsions, the attack of bronchitis occurring during the after vaccination period. *Conclusion.*

ARTHUR PEARSON LUFF, M.D.

CASE 233, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of A. R. H.: report to the Commission of Dr. Arthur Pearson Luff.

In February 1893 I was requested by the Commission to investigate the circumstances attending the death of A. R. H., late of ——, and the alleged connexion of the death with vaccination.

The entry in the register of the death of the child was to the effect that A. R. H., aged five months, died on the 12th February 1893, the cause of death being certified by Dr. F. E., of ——, as follows: "vaccinated (Public Vacci- "nator) one month; extensive sloughing of skin and "muscles for an area of nearly 3 inches round the vesicles "and almost down to the bone, 14 days; convulsions, two "days."

I proceeded to —— on the 3rd April 1893 and first interviewed Dr. F. E., who informed me that he saw the child for the first time on the 7th February (28 days after vaccination) and again on the 10th, and that the child died on the 12th. When he first saw her on the

7th February deep sloughing had then begun on the arm in the area of the vaccination marks, the skin around the sloughing area being natural in appearance, and the child seemed none the worse in general health. With this local condition there was no undermining of the skin around the ulcerated area and no suppuration.

I next interviewed the mother of the deceased, who informed me that the child was vaccinated by Dr. J. E., of ——, and that it was vaccinated from another child. The arm of the deceased went on well at first, and she did not take the child to the vaccinator for the second time until 13 days after vaccination; subsequent to that she applied cold cream to the arm, as the spots were getting inflamed and were spreading. The arm gradually got worse and into the condition described by Dr. F. E. when he first saw it on 7th February.

Sanitary surroundings.

The sanitary condition of the cottages, in one of which the deceased had lived, was very bad, there being only one privy with cesspool directly attached to every six cottages, and situated close to the cottages. Directly at the back of the cottages, and only about 14 feet in the rear of them, was a siding of the —— Railway, upon which some waggons containing manure had been allowed to remain up to and about the time the child's arm first began to get bad. All the neighbours agree that the smell from the manure in these waggons was at times almost intolerable, and Dr. P., Medical Officer of Health for the district, at the monthly meeting of the Rural Sanitary Authority, attributed the blood-poisoning from which he stated the deceased had suffered to the effluvia arising from the manure in these waggons.

I next interviewed Dr. J. E., of ——, the vaccinator of the deceased. He informed me that on the only occasion on which deceased was seen by him after vaccination (the 13th day after vaccination) the arm was doing well, and there was nothing unusual to note in connexion with it; the deceased was vaccinated along with nine other children from a child named L., of ——, who was originally vaccinated from a tube of Dr. Renner's calf lymph and whose vaccination had run a perfectly normal course.

Vaccinifer and co-vaccinees.

I saw the vaccinifer L., and found it to be a healthy child in whom the vaccination had been successful and normal. In addition to the deceased the following nine children had been vaccinated at the same time from this vaccinifer, viz.:—D., of ——, B., of ——, S., of ——, P., of —— E., of ——, H., of ——, H., of ——, L., of ——, and D., of ——. All these children were seen and were found to be quite healthy, the vaccination in each of them having run a perfectly normal course.

Conclusion.

The condition of local gangrene due to ulceration and fusion of the vaccination marks appears in this case to have been caused by poisoned air arising from the defective sanitary condition of the cottage in which the deceased lived or from the emanations from the manure waggons standing on the siding at the rear of the cottage.

In my opinion the condition of the arm was not directly due to vaccination, for the following reasons, viz.:—

(i.) The vaccinifer of the deceased was a healthy child in whom the vaccination had run a perfectly normal course;

(ii.) Nine other children vaccinated from this vaccinifer at the same time as the deceased did not suffer in any similar way to the deceased, and the vaccination in each of them ran a perfectly normal course; and

(iii.) A fortnight after vaccination, when seen by a medical man, the arm of the deceased was going on well, and nothing unusual was noticed by him.

ARTHUR PEARSON LUFF, M.D.

CASE 234, REPORTED TO THE COMMISSION BY THE CORONER.

Case of E. A. Copy of the depositions taken at an Inquest held on the body of E. A., and of the verdict returned by the Jury.

Information of Witnesses taken and acknowledged on behalf of our Sovereign Lady the Queen, at ——, on the 22nd day of February, in the year of our Lord 1893, before C. M., Gentleman, the Coroner for ——, at an inquisition then and there taken on view of the body of E. A. then and there lying dead, as follows (to wit):—

A. A., wife of G. A., forge labourer of ——, saith:—

Deceased is my daughter, and four months old come the 28th instant, and is not insured. I have no other children, and this is my first child. On Sunday night, between half-past 10 and 11 o'clock, I took the child to bed with me, the child then being hearty and well. My husband came to bed, and we lay talking, and he stretched over and kissed the child, and it was all right then. The child was between me and the wall, next the wall. At one o'clock I gave her the breast, when she took the milk as usual, and I then placed her in the bed, as she was before, on the pillow, and we never knew any more till half-past five, when my husband was called for work; then he said to me, "Look, A., how the child's lying." I found her on her left arm and side close to me, her head was down the bed, and she had turned down from where I left her. She never woke me after one a.m. She was dead, but quite warm. Her face was quite natural, and there was no froth about either nose or mouth, and nothing upon the napkin. Her legs being drawn up to the knees, and her hands clenched together. The child was vaccinated a week gone Friday by Dr. M., and appeared to suffer, as when she threw her arm out she cried. The arm was swollen a good deal, but no rash came out on the body anywhere. She had only breast-milk, and took it as well as she had previously done. After the vaccination (about four days) she was costive, and when the matter was taken off last Friday she turned costive again, but on the Sunday her bowels were in a natural condition. At no time after the vaccination was there any diarrhœa. The child's feet were on the pillow when I found her, and her head down over.

The mark × of A. A.

G. A., forge labourer, saith:—

After the child was vaccinated she never looked any worse; and there is no death-money to take. On Sunday she was hearty and well, and was never cross or peevish. I last knew she was alive about one a.m. on Monday morning. She was then lying off the pillow, a bit between my wife and the wall. About 5.30 I got a light to see what time it was, and I then noticed the child was lying queer; she was lying on her belly, feet on the pillow, and her head down over, and we found she was dead. The arm appeared sore after the vaccination, but nothing else. When I wakened up, as far as I saw by the lamp, there were no clothes on the child. The child was lying close in to the back of her mother when we found her.

The mark × of G. A.

G. S. H., M.B., of ——, saith:—

I was called to deceased about six. I found the child lying in bed, covered with the clothes, dead. There were no marks of injury on the body, which was well nourished and clean. There was no discolouration but on the back of the child, and no evacuation. The discolouration was echymosis, and the hands of the child together, thumbs turned in, and the fingers clenched over them, and feet also turned inwards. There was no flattening of the nose or mouth; no froth or mucous. I was present on the 10th when the child was vaccinated at the proper station by Dr. M., this child being the only one vaccinated from this lymph. It was taken (No. 80) from No. 69, a child, F. R., a strong, healthy child, of very healthy parents, Dr. M. had known some time. The child F. R. is healthy and well, and had no rash or sign of disease whatever about it, and I myself was vaccinated from the same lymph with no unhealthy sign resulting. I examined this child's arm on Friday, the 17th, and punctured it; the vesicles were healthy, and the four punctures were all successful. There was no extraordinary disturbance of the system, and the child was in a strong healthy condition and in a proper state for vaccination. The swelling of the arm was nothing more than ordinary. Taking all the circumstances of the child's death into consideration, and the evidence of the witnesses, I am of opinion the child died from asphyxia, from accidental suffocation, most probably due to altering its position after being placed at one o'clock, and during the parents' after-sleep. The parents showed no signs of either of them having been indulging in drink the night previous.

G. S. H.

J. K., wife of T. K., hawker, saith:—

I saw Mr. and Mrs. A. on Sunday night at 10 o'clock, when they were both sober and all right, no sign of liquor about them. She was then giving the child the breast, which was then hearty and well. About 5.30 next morning, I heard a shriek. I ran in, and found A. with

the child in his arms quite dead. She just appeared as if asleep. I never noticed anything about the child after vaccination, except it appeared uneasy about the arm. She never went off her food or ailed anything more than before it.

The mark of × of J. K.

All the foregoing depositions taken upon oath before me,

C. M., H. M. Coroner.

Verdict.

Accidentally suffocated whilst in bed with her parents.

CASE 235 [SERIES], REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of E. W. and W. J. H.: report to the Commission of Dr. Arthur Pearson Luff.

In March 1893 I was requested by the Commission to investigate the circumstances attending the deaths of two children, E. W. and W. J. H., late of ——, and the alleged connexion of the deaths with vaccination.

The entries in the register of the deaths of the children were to the effect that E. W., aged three months, died on the 7th February 1893, the cause of death being certified by Dr. F. W. S., of ——, as "vaccination; erysipelas, "fifteen days"; and that W. J. H. died on the 14th February 1893, the cause of death being certified, also by Dr. F. W. S., as "vaccination; erysipelas."

Dr. F. W. S., who had himself vaccinated both children at his surgery on the same day though from different vaccinifers, subsequently wrote with reference to the cases to the effect that, from inquiries he had made, he had come to the conclusion that vaccination had nothing to do with the erysipelas further than in causing the sore, through the medium of which the poison was introduced; that he had a case of erysipelas close to the houses occupied by the two deceased children; that none of the other children vaccinated at the same time seemed to suffer, with one exception, and that was a child that lived only four doors away from the other two cases.

Firstly, as to E. W.

I proceeded to —— on the 13th March 1893, and first investigated the case of E. W., of ——.

The child E. W. was vaccinated by Dr. F. W. S. on the 10th January 1893, and was inspected seven days later, when there were four healthy vesicles on the arm. The child then appeared to be in perfect health, and four other children were vaccinated from her. On the 23rd January (13 days after vaccination) she was again taken to Dr. F. W. S., and he then found that the child was suffering from erysipelas, which commenced on the shoulder of the vaccinated arm and then spread rapidly all over the body, the child dying on the 7th February. According to Dr. F. W. S.'s statement, the erysipelas was cutaneous throughout, there being no suppurative cellulitis at any time. The axillary glands were enlarged.

Mrs. W., the mother of the deceased, informed me that the child seemed to be going on quite well until the 22nd January (12 days after vaccination); on that day she first noticed the redness commencing on the left shoulder, above the vaccination marks, and that she took the child the next day to Dr. F. W. S. On the 17th January, the day that she took the child for inspection, she rubbed some cream into the vaccination sores as she thought they might be somewhat irritable to the child, and she also informed me that she also gave some of the same cream at the same time to Mrs. H., the mother of W. J. H., who also subsequently contracted erysipelas and died, and concerning whom I have made inquiry.

Sanitary surroundings.

The sanitary arrangements in connexion with Mr. W.'s house were not very good; there being a privy connected with a cesspool at the rear of the house, which cesspool was a concreted one, and had only been emptied three times in three years.

Vaccinifer and subvaccinees.

I next proceeded to view the vaccinifer of E. W., and the children vaccinated from E. W. The vaccinifer, A. B——e, of ——, seen by me, was a healthy child in whom vaccination had run a normal course; E. W. was the only child vaccinated from this vaccinifer. On the 17th January (seven days after the vaccination of E. W.) four children were vaccinated from her, viz.:—

H. W., ——, who was seen by me, and in whom vaccination had run a normal course.

N. L., ——, was seen by me, and in her vaccination had run a normal course.

E. D., ——, who was seen by me, and whom I found to have suffered from erythematous inflammation of the vaccinated arm; the inflammation of which had entirely subsided, and the vaccination sores had healed; and

J. D., ——, who had left the address given, and of whose whereabouts I could ascertain nothing.

Secondly, as to W. J. H.

With reference to the child W. J. H., of ——, Dr. F. W. S. informed me that this child was vaccinated by him on the 10th January 1893, on the same day as E. W., but from a different vaccinifer. The child was brought up for inspection on the 17th January (seven days after vaccination), when Dr. F. W. S. found that there was an erythematous rash around the vesicles, and on that account he did not vaccinate any children from him, and told the parents to bring the child to him again if he did not go on all right. Dr. F. W. S. was not called in until the 25th January (eight days later), when the child was suffering from erysipelas on the vaccinated arm; the erysipelas afterwards extending to the shoulder and across the body to the other shoulder and arm; the child dying on the 14th February. Previous to death the axillary glands of the vaccinated arm became considerably enlarged.

The grandmother of the deceased informed me that the vaccination seemed to be going on in a natural way until about the fifth day, when a redness formed around the spots (the erythematous rash referred to by Dr. F. W. S.), but that this redness seemed quite different to the inflammation which developed four days later, and which Dr. F. W. S. stated to be erysipelas. On the 17th January (seven days after vaccination) she and the mother of the child took him to Dr. F. W. S.'s for inspection, and there Mrs. W., the mother of the child E. W., gave them some cream, which they rubbed into the vaccination spots of W. J. H. This cream was some of the same cream that had been used by Mrs. W., and rubbed upon the arm of her child E. W.

Sanitary surroundings.

The inspection of the sanitary arrangements of Mrs. H.'s house showed them to be of a precisely similar nature to those of Mrs. W.'s house; the cesspool, which was a concreted one, was emptied four times a year; it was, however, in a very unsanitary condition when seen by me. A case of erysipelas had occurred at a house about midway between the houses occupied by W. and H., and only a few yards distant from either house, a few days previous to the time that the children developed erysipelas, but I could not trace any direct communication with the relatives or friends of this erysipelas patient, and the relatives or friends of the deceased children.

Vaccinifer and co-vaccinees.

I next proceeded to inspect the vaccinifer of W. J. H. and the children vaccinated at the same time from the same source. The vaccinifer of W. J. H. was A. B——y, of ——. This child I saw, and found him to be in a healthy state, the vaccination having run a normal and successful course. In addition to W. J. H., three other children were vaccinated from this vaccinifer, viz.:—M. E., of ——, H. W., of ——, and K. B., of ——; all of these I saw, and found to be in a healthy condition, the vaccination having run a normal and successful course in each.

General summary.

As the result of my inquiries I found that—

(i.) Both the children, E. W. and W. J. H., were free from erysipelas on the seventh day after vaccination;

(ii.) No other children vaccinated from the same sources developed erysipelas;

(iii.) Both children on the seventh day after vaccination had the vaccination vesicles rubbed with the same cream at the same time; and

(iv.) E. W. was found to be suffering from the erysipelas six days later, and W. J. H. eight days later.

I thought it desirable to see if it were possible to trace back the milk from which the cream had been taken, to the cow. Mrs. W. informed me, that the milk had been left on the evening of the 16th January at her house;

that she allowed it to stand all night in the kitchen (it was about 15 or 20 yards from the cesspool), and that the next morning she had removed the cream herself. I visited the milkman from whom this milk had been obtained, and found that it was utterly impossible to trace back the batch of milk to one cow, as he obtained his milk from several farms, and mixed all the batches together before selling it.

Conclusion. The two children E. W. and W. J. H. undoubtedly died of erysipelas. In my opinion, the erysipelatous poison was not inoculated with the vaccine virus at the time of vaccination, for the following reasons, viz:—

(i.) Neither of the children were suffering from erysipelas when inspected seven days after vaccination.

(ii.) E. W. was found to be suffering from erysipelas on the 13th day after vaccination, and W. J. H. on the 15th day after vaccination.

(iii.) The vaccinifers of the two children were both healthy and had never suffered from erysipelas; and

(iv.) The other children vaccinated from the same sources as E. W. and W. J. H. had all remained healthy, and did not contract erysipelas.

With regard to the actual source of infection, I am unable to say whence this was derived, but—

Firstly.—There was erysipelas in the immediate vicinity of the houses inhabited by the two children;

Secondly.—The sanitary conditions of the two houses, as regards the cesspools being allowed to remain unemptied for long periods, were not good; and

Thirdly.—On the seventh day after vaccination, the arms of the two children were rubbed with the same cream, which possibly might have been the medium conveying the erysipelatous poison into the vaccination sores.

ARTHUR PEARSON LUFF, M.D.

CASE 236, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of W. E. H.: report to the Commission of Dr. Arthur Pearson Luff.

In March 1893 I was requested by the Commission to investigate the circumstances attending the death of W. E. H., late of ——, and the alleged connexion of the death with vaccination.

The entry in the register of the death of the child was to the effect that W. E. H., aged six months, died on the 26th February 1893, the cause of death being certified by Dr. T. E. M., of ——, as "erysipelas following vaccination, "14 days; bronchitis, about 10 days; exhaustion."

On making inquiry I found that an attempt had been made to vaccinate the child with humanized lymph without result. Calf lymph was then obtained, and the child vaccinated on the 28th January 1893. On the 6th February the arm was inspected and was found in a normal condition without any undue redness or inflammation around the vesicles. The child was suffering from a cough at this time. Some tubes of lymph were taken from the vesicles, but were not employed and were subsequently destroyed. On the 9th February (12 days after vaccination) an erysipelatous blush was noticed round the vaccination spots, which spread to the neck and trunk, and afterwards to the other arm and to the legs. The bronchitis increased in severity, and the child died exhausted on the 26th February. The vaccination had been previously postponed as the child had been suffering from eczema of the head.

Sanitary surroundings. In the early part of January there had been a case of diphtheria next door, which led to an inspection by the sanitary authorities, whose officer found the drains very defective and the sinks and rain-water pipes connected to the drain without proper trapping. The drains were opened and were exposed at the time that the child W. E. H. was taken ill with erysipelas. At the house in which the child lived and died, a sanitary inspection was made 11 days previous to the child's death, when several defective sanitary arrangements were found.

Source of lymph. The lymph used to vaccinate the child was obtained a few days before the date of vaccination by Dr. T. E. M. from Mr. F. G. Rebman, of 11, Adam Street, Strand, who stated that he obtained it from the Institute of Dr. Pissin at Berlin. No other child was vaccinated from the same tube, and no child was vaccinated from W. E. H.'s arm.

Conclusion. That the erysipelas was not introduced with the lymph seems clear from its not having shown itself till the 12th day after vaccination. In my opinion the erysipelas virus was brought to the open wounds through the unsanitary condition of the house in which the child lived, and of the adjacent house, the drains of which were open at the time that erysipelas manifested itself.

ARTHUR PEARSON LUFF, M.D.

CASE 237, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of J. D. H.: report to the Commission of Dr. Arthur Pearson Luff.

In March 1893 I was requested by the Commission to investigate the circumstances attending the death of J. D. H., late of ——, and the alleged connexion of the death with vaccination.

The entry in the register of the death of the child was to the effect that J. D. H., aged five months, died on the 27th February 1893, the cause of the death being certified by Dr. F. W. S. D., of ——, as "infantile diarrhœa, etc., "complicated by vaccination; broncho-pneumonia."

On making inquiry I found that the deceased was vaccinated from a tube of calf lymph obtained from Dr. Renner's establishment, and numbered ———. On the 10th February—7 days later—the child's arm was inspected and was then passed as a successful vaccination.

At the time of vaccination the mother omitted to mention to the doctor that the child was suffering from troublesome diarrhœa, which he had had for some days previous to vaccination. On the 15th February Dr. F. W. S. D. was called in to attend the child for diarrhœa and stomatitis, but at that time (12 days after vaccination) the vaccinated arm was doing very well. The sub-maxillary glands enlarged as a result of the stomatitis, and finally broncho-pneumonia supervened, which was the ultimate cause of death. According to Dr. F. W. S. D.'s statement he informed me that he did not consider that the diarrhœa and broncho-pneumonia were in any way connected with the vaccination, and that he merely mentioned vaccination in the death certificate because he considered that the presence of the vaccinated arm might be, to a certain extent, a factor in the cause of death.

Co-vaccinee. No other child was vaccinated from the same tube of calf lymph as that from which the deceased was done. One other child was vaccinated by Dr. F. W. S. D.'s partner from lymph obtained from the same calf, and the vaccination of that child did perfectly well.

Conclusion. The death of the child J. D. H. was evidently due to gastro-enteritis, with which the child was affected previous to vaccination, and to the subsequent supervention of broncho-pneumonia; neither of these affections seem to have been in any way due to the vaccination, which was apparently running a fairly normal course.

ARTHUR PEARSON LUFF, M.D.

CASE 238, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of P. S.: report to the Commission of Dr. Thomas Dixon Savill.

On the 11th March 1893 I was requested by the Commission to investigate the circumstances attending the death of P. S., a child 17 days old, who was born on Sunday, the 5th February 1893 at ——, who died in the Dallam Lane (Warrington) Small-pox Hospital (Hope Hospital) on the 22nd February, and was certified by Dr. J. G. Gornall as having died from "premature birth; vaccination"; and I beg to report as follows:—

I have seen the certifying practitioner, the Medical Officer of Health, the midwife, and all others capable of giving any information.

The mother, A. S., aged 19 years, an unmarried girl, fell ill with small-pox on Saturday, February 4th, and was confined at home, ——, prematurely, *i.e.*, at the eighth month, on Sunday, February 5th. She was attended by a midwife (Mrs. S. C., ——), who confirms the statement that the labour was natural, but that the child was unduly small and feeble.

The next day, February 6th, the mother developed the rash of small-pox. She was removed to hospital *with her baby* on Tuesday, the 7th.

The child was vaccinated by Dr. J. H. Gornall (the Medical Officer of Health) on the morning of Tuesday, the 7th, just before removal to hospital, in four places, with calf lymph obtained from Dr. Renner's Vaccine Establishment in tubes.

This vaccination was not successful, it did not "take." It is said that no number was supplied with this lymph, and there are no means of tracing it; but two other people were vaccinated from the same tube at the same time—the grandmother (successfully) and the aunt (unsuccessfully) of the child. Neither of these presented any untoward sign at any time.

On February 9th, after admission, Dr. J. G. Gornall, the Medical Officer of the Hospital, fearing that the first vaccination would be unsuccessful, vaccinated the child a second time, on the same arm, but in three fresh places, with calf lymph in tube, obtained from Dr. Renner's Establishment, similar to that used by his father.

The three second inoculations matured, forming three ordinary healthy vesicles, without any undue areolæ, swelling, or other bad sign on February 16th. The four first punctures underwent no change.

On February 18th, 14 days after the onset of small-pox in the mother, according to the report of Dr. J. G. Gornall, under whose care the child was, about 10 papules appeared on the child, one on the face and the rest on the body. On the 19th these became slightly vesicular, and afterwards the contents became opaque. There were no constitutional signs, and the rash was very slight. The child gradually got weaker and died on the 22nd.

There was not at any time any sloughing, ulceration, or other untoward complication of vaccination.

Most of these particulars I have obtained from Dr. J. G. Gornall (who attended the case from beginning to end), with confirmation from other sources.

He further adds that it is "doubtful if the child would "have survived under any circumstances because of its "feebleness at birth," and moreover that he "intends to "modify his certificate of death by adding 'modified "'small-pox' as a third factor in the causation of death."

I have ascertained that the child probably only weighed 5 or 6 lbs. at birth; that his mother, a case of confluent small-pox, was too ill to nurse it at the breast; that the child was too weak to feed from a bottle, and was therefore fed by spoon during the 17 days which he lived.

In view therefore of all the circumstances of the case it seems to me to be clear:—

(i.) That the chief, probably the only, cause of death was *asthenia* from premature birth.

(ii.) That the vaccination bore so small a part in the causation of death that it seemed scarcely justifiable to add it to the certificate.

(iii.) That the performance of vaccination was fully justified, although in so young and weak a child, by the fact of the mother developing small-pox the day after confinement.

(iv.) That the operation was performed with all the necessary precautions.

(v.) That the vaccinia throughout was of a normal healthy character.

(vi.) That the slight papulo-vesicular rash, even if it were not modified small-pox, which Dr. J. G. Gornall now suggests, was unconnected with vaccination, and was hardly itself a contributory cause of death.

THOMAS DIXON SAVILL, M.D.

CASE 239, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of F. C. C.: report to the Commission of Dr. Arthur Pearson Luff.

In March 1893 I was requested by the Commission to investigate the circumstances attending the death of F. C. C., late of ——, and the alleged connexion of the death with vaccination.

The entry in the register of the death of the child was to the effect that F. C. C., aged two months, died on the 8th March 1893, the cause of death being certified by Dr. E. N. D., of ——, as "vaccination, 21 days; erysipelas of "arm, 5 days."

I proceeded to —— on the 4th April 1893 and first interviewed Dr. E. N. D., and his assistant, Mr. C. J. W., who was the vaccinator of the child. They informed me that the deceased was vaccinated on the 13th February in four places from the arm of another child; the deceased was seen again on the 20th February (seven days after vaccination) when the vaccination was pursuing a normal course, and was marked as successful; nine days later, *i.e.*, on the 16th day after vaccination, Dr. E. N. D. was called in to see the child, when it had erysipelas of the left arm, and the redness was commencing to extend across the chest; and the glands in the left axilla were inflamed. On inquiry I ascertained that there had been no cases of erysipelas in the neighbourhood at or about the time of the child's vaccination.

I next interviewed the parents of the deceased, and made an inspection of the cottage occupied by them. They informed me that the vaccination was going on well up to the eighth day, when each of the vaccination marks on the child's arm was pricked by a neighbour with a needle, which needle they thought was probably not in a clean condition; the object of this was that the neighbour assured them that it did the vaccination good to prick the places with a needle. After the pricking the places gradually became inflamed, and six days later a well-defined redness had started around the vaccination marks.

Sanitary surroundings.

The cottage occupied by the parents of the deceased was the usual kind of stone cottage found in these colliery districts, and 14 feet in the rear of the cottage was a small stream which received the drainage both from privies, sinks, and surface water of all the cottages; this stream, at times, I was informed, stank abominably; the privies were situated at the side of the stream immediately in the rear of the cottages.

Vaccinifer and co-vaccinees.

I next proceeded to see the vaccinifer of the deceased, and the other children vaccinated from the same source. The vaccinifer was G. H. C., of ——; from this vaccinifer four children were vaccinated in addition to the deceased, viz., F. S. S., of ——; H. P., of ——; C. N. T., of ——; and H. C., of ——. I found the vaccinifer and all these four children that had been vaccinated from it to be healthy children, in each of whom the vaccination had run a perfectly normal course and been attended with no complications whatever.

Conclusion.

The deceased died, in my opinion, of erysipelas, contracted between eight and fourteen days after vaccination; the source of the erysipelas was probably through the pricking of the vaccination places with a dirty needle, or from the bad gases, &c. evolved from the sewage-carrying stream at the back of the cottage. The poison of the erysipelas was not, in my opinion, introduced with the vaccine virus at the time of vaccination for the following reasons, viz.:—

(i.) Erysipelas did not develop itself until somewhere between the 8th and 14th day after vaccination.

(ii.) The vaccinifer of the deceased was a healthy child, in whom the vaccination had run a perfectly normal course; and

(iii.) Four other children, vaccinated from the same vaccinifer as the deceased, did not suffer from erysipelas or any complication, and in each of them the vaccination ran a perfectly normal course.

ARTHUR PEARSON LUFF, M.D.

Case 240, reported to the Commission by the Local Government Board.

Case of M. L. : report to the Commission of Dr. Arthur Pearson Luff.

In March 1893 I was requested by the Commission to investigate the circumstances attending the death of M. L., late of ——, and the alleged connexion of the death with vaccination.

The entry in the register of the death of the child was to the effect that M. L., aged seven months, died on the 12th March 1893, the cause of death being certified by Mr. T. T. T., of ——, as "measles (followed by bronchial "catarrh); severe inflammation, 5 days, and œdema of "left arm and forearm following vaccination, 5 days; "convulsions and exhaustion."

On the 15th March on receipt of a copy of this death certificate I at once communicated with the certifying doctor, Mr. T. T. T., in the hope that I should be able to see the body of the child previous to burial; but I was informed that the child had been buried the day before I telegraphed to him. Shortly after this Mr. T. T. T. suddenly left ——, leaving no address with anyone there, that I could discover, and all my communications with him have simply been returned through the dead letter office.

The substance of this report is, therefore, based upon inquiries that I have made amongst the parents of the deceased, and of the Vaccination Officer and registrar; for the purpose of these inquiries I proceeded to —— on the 16th June 1893.

It appears that Mr. T. T. T. vaccinated the deceased on the 20th February; he vaccinated her from a tube of calf lymph, no other child being vaccinated at the same time; only one place upon the left arm was done. On the 27th February the mother took the child to Mr. T. T. T.; he passed it; and entered it as a successful case of vaccination, but no child was vaccinated from M. L. either then or subsequently. On the 4th March, *i.e.*, 13 days after vaccination, the arm began to be inflamed; the inflammation commencing around the vaccination place, which was at the time scabbed over and discharging a slight amount of yellowish fluid. The mother, previous to the commencement of this inflammation, had applied, and at the time was applying, cream to the vaccination spot. The inflammation spread down the arm to the hand, and then to the left side of the chest. Mr. T. T. T., who saw the child at this time, stated that measles were setting in, and ordered the application of linseed poultices. On the 9th March convulsions commenced, and on the 12th the child died.

Conclusion. From the imperfect account of the condition of the child previous to death, that I have been able to get, and from the absence of any medical attestation to the rash that the child suffered from, on account of the medical man who attended having left ——, I am unable to state what was the nature of the rash that appeared on the arm and chest; the inflammation, however, did not commence until the 13th day after vaccination; and though it may have been of an erysipelatous character, it is not probable that it was due to impure vaccination lymph. In support of the child having had an attack of measles, as certified by the medical man, there was a good deal of measles about in —— and the vicinity at the time. The sanitary arrangements of the cottage where the child lived were good, and were not likely to have been productive of any form of septicæmia.

Arthur Pearson Luff, M.D.

Case 241, reported to the Commission by the Coroner.

Case of N. B. : report to the Commission of Dr. Arthur Pearson Luff.

On the 1st April 1893, at the request of the Commission, I attended the Coroner's inquest touching the death of N. B., aged six months, who died on the 28th March. A communication had previously been received by the Commission from the Coroner to the effect that an inquest would be held on the 1st April on the body of N. B., aged six months, who died on the 28th March at —— from, it was alleged, exhaustion and blood-poisoning following vaccination; and that the deceased had been vaccinated on the 2nd February at ——.

The post-mortem examination of the deceased was held just previous to the inquest, and I was present at both the post-mortem examination and the inquest. At the inquest evidence was given to the following effect.

Mrs. E. B., the mother of the deceased, stated that the child was six months old, and that she had died on the 28th March. She was vaccinated on the 2nd February by Dr. R. C., and was seen and examined by him on the 9th February (seven days later). She was a fairly strong child when born, but was attacked with diarrhœa and sickness two months before vaccination, from which attack she recovered, and later on was vaccinated. When two months old she had a rash on the buttocks, the rash lasting a week; she also had snuffles when born, lasting about a month; she was fed entirely from the bottle; she was vaccinated by Dr. R. C. at —— on the 2nd February in five places; the vaccination places were near to one another, being about ¼ in. between each. About the 17th February (15 days after vaccination) the places got worse and ran together. On the 22nd February (20 days after vaccination) she again took the child to Dr. R. C., as the arm was bad and was discharging matter. Dr. R. C. advised that bread poultices should be applied till the scabs came off, and then to apply zinc ointment. The scabs came off in two days. Previous to going to Dr. R. C. she had applied wet rags to the arm; she had been careful not to allow friction from the sleeve of the child's dress against the vaccination marks. The arm after the application of the zinc ointment and the poultices got worse. On the 4th March (30 days after vaccination) she took the child to Dr. J. H. There was then a large discharging wound on the arm in the vaccination area. Dr. J. H. prescribed some medicine and an ointment; the wound improved and continued to do so until a week before death, when red and dark-coloured patches appeared on the opposite arm from the shoulder to the elbow. She applied a lotion by the direction of Dr. J. H., and the redness disappeared under the treatment, but the dark patches remained. A blister formed on one of these dark patches on the right elbow, and broke about four days before death. At 6.30 a.m. on the 28th March the child died suddenly. In answer to questions put by me the mother stated that the rash upon the buttocks, which lasted a week, was a red rash (from her description it was probably a little eczema). The child had been brought up entirely on Ridge's food and condensed milk. At no time after vaccination did the deceased suffer from convulsions, vomiting, or diarrhœa; she was quite sure that she took every precaution to avoid the rubbing of the child's dress or of the night clothes against the vaccination spots. The rags that she applied to the arm were moistened with cold water, and she allowed one to remain on all day and another one all night, so that these rags dried upon the arm. On the morning on which the child died she fed the child at 5 a.m., and afterwards went to sleep, and at 6.30 a.m. found that the child was dead. To her knowledge the bedclothes had not been over the child's face.

Mr. T. J. B., the father of the deceased, desired to state to the Coroner that he considered blood poisoning began a week before death occurred (47 days after vaccination).

Dr. J. H., of ——, stated that he saw deceased on the 4th March (30 days after vaccination). She then had one large ulcerated surface on the left arm occupying the vaccination area and discharging unhealthy pus; he ordered the application of zinc and elemi ointment. He saw the child next on the 8th March, and after that every four or five days. On the 19th March (45 days after vaccination) an erysipelatous rash appeared on the back of the neck and on the left arm, and shortly afterwards dark patches of small effusions of blood appeared on the right arm. He saw deceased last on the 24th March; the erysipelas was then getting better, but a large blister containing blood had formed on the left elbow. He had made a post-mortem examination of the deceased that day; the body was not specially emaciated, but was not well nourished. The wound on the left arm was about 2 inches long by 1½ inches wide, and extended down to the muscles. The base of the right lung was congested and slightly inflamed. The other viscera were fairly healthy. He considered that the immediate cause of death was syncope consequent on commencing pneumonia occurring whilst suffering from erysipelas following vaccination. In his opinion the large wound on the arm resulting from or following vaccination predisposed to erysipelas. He had never on any previous occasion seen erysipelas after vaccination. In answer to one of the jury, Dr. J. H. stated that, if impure lymph had been used, the probability was that symptoms would have appeared sooner. In answer to a question put by me, Dr. J. H. stated that there

were no secondary abscesses in any parts of the body and no sign of pyæmia.

Dr. R. C., stated that he vaccinated deceased on the 2nd February. He saw the child again on the 9th February (seven days later); she was then doing well. He saw her next on the 28th February (26 days after vaccination); she then had five deep ulcers and a large scab covering all the five. He advised poulticing to remove the scab, and then the application of zinc ointment. He had been present at the post-mortem examination, and had seen no appearances of erysipelas on the body of the deceased. He had vaccinated the deceased with calf lymph, 55 other children being vaccinated on the same day from the same calf. Of these 55, two were brought back to him with superficial ulceration of the vaccination marks, from which they soon recovered and got quite well. The remaining 53 children, with the exception of the deceased, all did well. In answer to a question put by me, Dr. R. C. stated that the deep ulceration of the arm might have been caused by the application of the wet rags keeping the scabs moist and so allowing further inoculation to take place.

The verdict was to the effect that deceased died from syncope consequent on commencing pneumonia, and while suffering from erysipelas following vaccination, and that death was due to natural causes.

I subsequently visited the house in which the deceased had lived. The sanitary arrangements were fairly good, except that the sink in the back kitchen communicated directly with the drain, and was so inefficiently trapped that a bad smell was constantly coming up through the pipe into the house.

It would seem that the cause of the fusion together and ulceration of the vaccination marks is somewhat obscure. These conditions were due probably, in part, to the weak and badly nourished condition of the child, and, in part, probably to the application of the wet rags, which were allowed to dry on the vaccination sores and to remain 12 hours at a time; and also may have been attributed to, if not caused by, the defective sanitary arrangements of the house.

From the evidence it appears that erysipelas started from a sore on the arm about 45 days after vaccination and spread across the back of the neck over to the other arm, and that the child died from exhaustion consequent upon some inflammation of the lungs. In my opinion the erysipelas was not directly caused by vaccination, for the following reasons, viz.:—

(i.) It did not appear until about the 45th day after vaccination; and

(ii.) Fifty-five other children were vaccinated at the same time as the deceased and from the same batch of calf lymph, and none of these subsequently suffered from erysipelas.

ARTHUR PEARSON LUFF, M.D.

CASE 242 [SERIES], REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of J. H. W., L. F. S., A. W., K. B. and E. R.: report to the Commission of Dr. Sidney Coupland.

J. H. W., when aged six months, was vaccinated with eleven other children on the 21st February 1893 by Mr. W. S. M., L.R.C.P., Public Vaccinator at ——. J. H. W. died on the 26th March 1893, the cause of death being certified by Dr. W. S. M. as "erysipelas after vaccination." Of the 11 co-vaccinees with J. H. W., four developed symptoms similar to his, one case being even more severe.

I visited —— on the 16th April 1893, and made inquiry into the particulars of these cases.

J. H. W. was the fifth child of H. and I. W., living at —— Row, ——. He was healthy up to the date of vaccination and had been entirely breast-fed. On Tuesday, the 21st February, his mother took him to Dr. W. S. M.'s surgery to be vaccinated. He was one of 12 children who were vaccinated on the same day, all from the same vaccinifer, M. A. C., of ——. The cases appear in the register as follows:—

No.	Vaccinated.	Name.	Age.	Result.
81	Feb. 14th	M. A. C.	5 months	3 vesicles, successful.
99	Feb. 21st	M. O'M.	6 „	3 „ „
100	„	H. L.	4 „	4 „ „
101	„	A. E. R.	3 „	4 „ „
102	„	C. H.	2 „	4 „ „
103	„	*J. H. W.*	6 „	4 „ erysipelas.
104	„	J. T.	2 „	4 „ successful.
105	„	L. F. S.	1 „	3 „ erysipelas.
106	„	A. W.	6 „	4 „ „
107	„	W. W.	3 „	2 „ very slight success.
108	„	K. B.	4 „	3 „ erysipelas.
109	„	E. R.	2 „	3 „ „
110	„	A. P.	3 „	2 „ successful.

I had the opportunity, through the kindness of Dr. W. S. M., of visiting each of these children at their own homes, and I propose to take them in the foregoing order:—

No. 81 in the register. *M. A. C.* The vaccinifer, now (16th April 1893) seven months old, a well-nourished, plump infant, entirely breast-fed. She presents three slightly depressed marks on the left arm, one very small, two each about ¼ inch diameter. The course of vaccination was quite normal. There are four children in the family, but the house (——) is not very sanitary. It forms one of a row, and consists of four rooms, the kitchen opening into an alley, in which at a short distance are situated the privy-middens for the inhabitants of the whole row of houses. There have been two cases of typhoid fever in this family within the last year. [Typhoid has occurred in other houses of this road, which, together with —— Row, where the child J. H. W. lived, are the unhealthiest in ——.]

No. 99 in the register. *M. O'M.*, of ——, now eight months old, for most part breast-fed; but occasionally has bread and milk. The family are very poor, husband been away 10 months; but this child is fairly nourished. Dwelling, not clean, two rooms. The child has three vaccination marks of various sizes. Nothing abnormal in the course of vaccination.

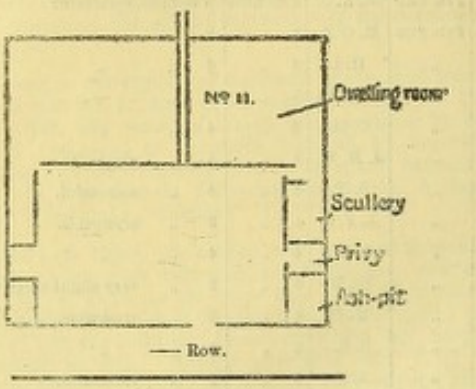
No. 100 in the register. *H. L.*, of ——, six months old; has three marks, all fairly small; course of vaccination normal. Child has been partly breast-fed, partly hand-fed (milk). The house is clean and commodious.

No. 101 in the register. *A. E. R.*, of ——, five months old; has four good marks. Is a healthy well-nourished infant, wholly breast-fed. Rooms small, fairly clean.

No. 102 in the register. *C. H.*, of ——, four months old; exhibits now three marks, the lower ones having apparently "run together." The vaccination itself ran a normal course; but subsequently there has been some eczema at the bend of the elbow, where there is now a small excoriation; and in opposite axilla there is a similar excoriated spot. The other child of the family has impetigo of the face, and the mother (a German) has a tendency to eczema. The dwelling-room is dirty; and the mother thinks that the child's arm may have been rubbed. Otherwise the child is in fair health and nutrition; she is solely breast-fed.

No. 103 in the register. *J. H. W.*, of —— Row. About the sixth to seventh day of his vaccination a small bleb formed just outside the uppermost vaccine vesicle, which it partly encircled. A zone of redness appeared around this, which developed the characters of erysipelas. It was treated at first by application of boracic solution, and later of calamine and bismuth. The arm swelled from shoulder to elbow, but the erysipelas did not become general; the local inflammation and ulceration was, however, severe, and the axillary glands enlarged, and the child died on the 26th March 1893, nearly five weeks from date of vaccination, and four weeks from first onset of symptoms. The father is a miner; there are four other children, aged 11, 9, 7, and 4 years

respectively, all have been vaccinated, and nothing abnormal noticed about their vaccinations. The infant J. H. W. was wholly breast-fed, and in good health up to the time of vaccination. The mother seems healthy. The house is a back-to-back one, there being three rooms, two sleeping rooms, and one dwelling-room, with stone floor, about 15 ft. square, used as kitchen, and ill-kept. The door



opens into a passage leading to a scullery, in front of which is the privy, entered from the garden, and that again abuts on a large open ash-pit, which at the time of my visit was full of refuse. The mother said that after the vaccination she kept the child's arm uncovered, that nothing rubbed it, and that she kept it clean.

No. 104 in the register. *J. T.*, of ——, four months old; one of five children, all of whom are healthy. He has four good-sized marks. The course of vaccination in him was normal. He is well-nourished, and has been wholly breast-fed.

No. 105 in the register. *L. F. S.*, of ——, three months old, presents evidence of considerable lesion at the vaccination site, there being now a large irregular depressed area of cicatrisation formed by the confluence of the three vesicles, the area of which has been extended by ulceration. Dr. W. S. M. says that at the time this child's arm was worse than that of No. 103. The child has made a good recovery, and is now plump and well-nourished. She has been wholly breast-fed. The house, which is on the opposite side of the road to that of No. 81, has two rooms on the ground-floor, the back-room or kitchen opening into an alley, and having within five yards of it a large privy-midden.

No. 106 in the register. *A. W.*, of ——, seven months old, a somewhat pale but well-nourished child, who has been wholly breast-fed. She was vaccinated in four places, and there are now four rounded marks, the two lower ones being contiguous to one another, they are of small size. Within a week of the vaccination, a bleb formed close to the uppermost vesicle, and the arm swelled from the elbow to shoulder. At the time this case was "almost as bad" as that of No. 105 (Dr. W. S. M.). The house is clean, the family (four children) inhabit four rooms, the site is open, and the privy and ash-pits are at some distance from the house.

No. 107 in the register. *W. W.*, of ——, five months old; is extremely marasmic. He has been brought up from birth on "Neave's Food and condensed milk"; has impetigo on the head; face pinched, and skin hangs in folds on the limbs. The parents were very anxious to have the infant vaccinated, but as he was so puny and delicate. Dr. W. S. M. made only two minute insertions, which took slightly, without any local trouble. There is only one small faint mark to be seen. The child is evidently atrophic from improper feeding; he has not suffered from diarrhœa. The mother says that all her other children, four in number, and healthy, were similarly brought up.

No. 108 in the register. *K. B.*, of ——, six months old; is fairly nourished. She presents still (16th April 1893) two places thickly encrusted with scabs, together with one mark from which a scab has only recently been detached, and a small pustule above that. In this case also a bleb formed above the uppermost vaccine vesicle on the seventh day of vaccination.

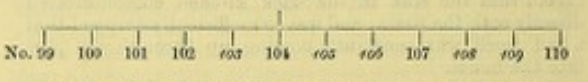
No. 109 in the register. *E. R.*, of ——, five months, breast-fed; one of a family of seven children; well cared for. The house is clean. She presents three marks; the upper one largest. In this case a bleb formed near the upper vesicle on the fourth day of vaccination, and the mother took the child to Dr. W. S. M. on the Monday, the day before the proper day for inspection. There was swelling from the elbow to the shoulder. The infant looks healthy and well nourished.

No. 110 in the register. *A. P.*, five months old; presents two fairly large marks. The vaccination ran a normal course. The child is well-nourished; breast-fed.

To sum up:—

The vaccinifer, No. 81, a healthy child of healthy parents; vaccinated on the 14th February, brought for inspection on the 21st, and utilised for the arm-to-arm vaccination on that day of Nos. 99 to 110, in the order stated. Of these 12 vaccinees, vaccination was normal in Nos. 99, 100, 101, 102, 104, 110, and (slight) in 107; abnormal in Nos. 103, 105, 106, 108, and 109, in *each* of whom there appeared, mostly on the sixth to seventh day, and in one (109) on the fourth day, a bulla close to the uppermost vesicle, *i.e.*, the site of the first insertion in each case, which was followed by a certain amount of local, but not marked, ulceration, and a condition of "erysipelas" with swelling of the arm from shoulder to elbow. The localised character of the inflammation is noteworthy. In no case did the erysipelas become general. The difference in result may in part be due to difference in environment; for of all these, No. 103, who died, seems to have been under the worse sanitary surroundings, not worse, however, than some of the others in whom the vaccination ran a normal course.

No. 81.



It is, therefore, fair to assume that the cause of the abnormal result of vaccination in the fatal case of J. H. W. was the same as in his four co-vaccinees who were similarly attacked.

We must then exclude from the category of exciting cause any home conditions or neglect on the part of the mothers. There is, moreover, no evidence in any one of the cases of the vesicles having been injured or ruptured before the onset of the "erysipelatous" inflammation.

The abnormality would depend then upon a factor introduced at the time of the vaccination. This must either be (*a*) something special to the inoculated lymph; or (*b* something extraneous introduced into the vaccination wound together with the lymph.

(*a.*) That the lymph itself was of the natural quality and character seems certain from—

(1.) The health of the vaccinifer and her parents;

(2.) The normal evolution of her vaccine vesicles;

(3.) The normal course taken by the vaccination in seven vaccinees out of the twelve;

(4.) And even in those affected, the abnormality did not invariably affect every vesicle.

(*b.*) The method followed by Dr. W. S. M. is to use a perfectly clean lancet, which he showed me, kept in a case, and cleansed with water and a clean towel between each vaccination. He takes the lymph as required from the vesicle of the vaccinifer, and transfers it to the vaccinee's arm, smearing it on to the diamond-shaped places which he has made with the point of the lancet on the vaccinee's arm to the number of from two to four. [Dr. W. S. M. has experienced a not uncommon difficulty in sometimes persuading parents to have four insertions made.] He is very careful to avoid taking any blood with the lymph.

He was not attending any case of erysipelas at that time (although, curiously, he had the next day to attend a very severe case of that disease), and there was no infectious disease in the neighbourhood of the surgery where the vaccinations are done.

The surgery-room where the vaccinations are done is small but well kept. The children to be vaccinated are called in one by one from the waiting-room, Dr. W. S. M. having previously inspected those who have come for that purpose, and having made his selection of vaccinifers.

I am unable to assign the abnormality in these cases to any neglect or carelessness on the part of the vaccinator, or to the conditions under which vaccination was performed on that day.

There still remains another possible explanation of the result of vaccination in these five cases. It may be observed that the four children who were the first to be

vaccinated on this day (Nos. 99 to 102) passed through their vaccination normally, whilst the abnormal ones follow in almost unbroken series—(No. 107 being so slightly vaccinated as hardly to be taken into reckoning)—from 103 to 109. Now the vaccinifer had three vesicles, two of fair size and one small one. The lymph would be taken from these in turn, and the second vesicle would not be opened until the first had yielded all its lymph. It is Dr. W. S. M.'s impression that he vaccinated four children from the first vesicle and that No. 103 was the first to be vaccinated from the second vesicle; whilst No. 110 was the only one vaccinated from the small third vesicle. It is very likely that this was the case, and it suggests that the difference in result was owing to some *difference in quality of the material* inoculated from these three different sources. The fact, however, that the result was normal in No. 104 and in No. 107 (so far as the latter's imperfect insertion goes) seems to acquit the *lymph* of the second vesicle *itself* from blame; to say nothing of the inherent improbability of one vaccine vesicle yielding a lymph of different quality from that given by its fellow.

The question, therefore, seems to be narrowed to this conclusion. That in taking the lymph from the second vesicle some impurity was added which imparted to this lymph the property of exciting erysipelatous or quasi-erysipelatous inflammation. For it may be pointed out, in each case the abnormal condition started from the uppermost of the vesicles, that is from the *site of the first-made* inoculation. [Dr. W. S. M. tells me that the bleb-formation was limited to this region in all of the cases; his assistant, Dr. J., also noticed this.] Does not this suggest the immediate transference of some "septic" (that is to say, non-vaccinal) virus which had adhered to the lancet as it was being withdrawn from the punctured vesicle, or after it had received its drop of lymph? How otherwise can one account for the curious coincidence of the lesion originating in each case at this site, and the freedom of the other sites from the abnormality?

My experience of vaccinal injuries is too small to recall any precisely similar instance; and I dare not dogmatise on the point. It would be easy, of course, to assert that the cause of the trouble in these cases—for we cannot separate the case of J. H. W. from the rest—was something inherent to vaccination *per se*; but I respectfully venture to think that the more critically and closely these cases are examined the less tenable does such a hypothesis become. At the same time I am unable to name the agency which was at work here. If, as we must believe, it was introduced together with the vaccine lymph, the time that elapsed between inoculation and local manifestation is much longer than the virus of erysipelas usually takes to exert its effect.

SIDNEY COUPLAND, M.D.

CASE 243, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of E. W.

Copy of letter from the Local Government Board informing the Commission of the case.

Local Government Board,
Whitehall, S.W.
8th April 1893.

SIR,

I AM directed by the Local Government Board to forward for the information of the Royal Commission on Vaccination the accompanying copy of a report which they have received from their Inspector, Mr. Wilfred Fletcher, in reference to the death of E. W. from erysipelas after vaccination, in the —— District of the —— Union.

I am, etc.,
ALFRED D. ADRIAN,
Assistant Secretary.

Bret Ince, Esq.,
Secretary,
Royal Commission on Vaccination.

(*Enclosure.*)

—— Union. —— District.

Notes on a fatal case of erysipelas which occurred subsequently to vaccination.

E. W., aged seven months, was vaccinated on June 17th, 1892, from W. G. D. who was in good health. On July 14th the child had an attack of facial erysipelas from which she died on July 27th. Eight other children were vaccinated from the same vaccinifer, and in several cases the operation was followed by an eruption, but the children did well. There had been a case of erysipelas in the house in which the deceased child lived, some short time before she was taken ill.

WILFRED W. E. FLETCHER.

March 23rd, 1893.

Copy of a letter subsequently received by the Commission from the medical man by whom E. W. had, it was stated, been vaccinated.

SIR, 24th April 1893.

IN reply to your letter I beg to say that the child E. W. vaccinated by me on the 17th of June last developed facial erysipelas on the 13th of July and died on the 27th of the same month. As the arm did well and as there had been previously another case of erysipelas in the same house I do not in any way attribute the fatal result to vaccination.

I am, etc.,
W. S.

Bret Ince, Esq.

CASE 244, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of W. H.: report to the Commission of Dr. Thomas Dixon Savill.

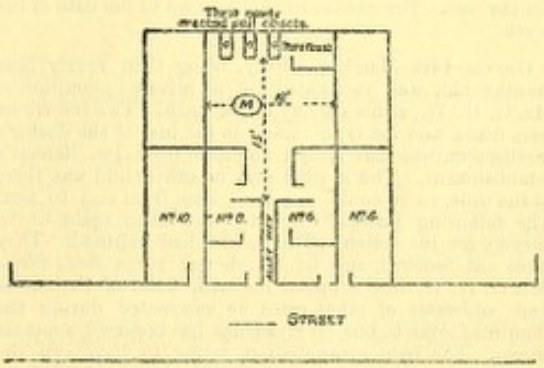
On the 20th April 1893 I was requested by the Commission to inquire into the circumstances of the death of W. H., a child aged five months who died on the 18th April 1893, the cause of death being certified by Mr. J. W., M.B., as "vaccination, 5 weeks; erysipelas, 2 weeks;" and I beg to report that I proceeded next morning to ——, placed myself in communication with the certifying practitioner, saw the relatives of the child, and arranged to hold an autopsy next morning.

I have since seen the Acting Medical Officer of Health, Mr. J. R., and the doctor who vaccinated the child, Mr. G. H. W., and others capable of giving information.

The child was born on the 18th November, 1892, vaccinated on the 14th March 1893, contracted erysipelas on the 4th April, and died on the 18th April, 1893.

House of parents.

W. H. lived and died at the house of his parents ——, in the north-west part of ——, a large mining and colliery town of ——. The house occupied by the H.'s is a small back-to-back one, marked No. 8 on the plan just below, in



Ground Plan of No. 8, —— Street, ——.

M = ashes filling up old midden-privy at the time of my visit, 22nd April 1893.

fair repair. It has one living room downstairs, about 12 feet square, and two small bedrooms upstairs, each about 10 feet square. The exact cubic capacities of these rooms, supplied to me by the courtesy of the Medical Officer of

Health, are—kitchen 1,671 cubic feet, bedrooms 1,142 and 752 cubic feet respectively, giving an aggregate air space per head to the inmates of 209 cubic feet by day and 236 cubic feet by night; the minimum recommended by the Model Bye-laws being 300 cubic feet. The occupants numbered four adults and four children; they consisted of T. H., a collier, aged 34; his wife, aged 26; and two other colliers, aged 25 and 24 respectively, and four male children, 8 years, 4 years, 2 years, and 5 months old respectively. The house, therefore, is overcrowded. It is ill-ventilated, and the inmates are, moreover, dirty in their habits, partly no doubt by reason of their occupations. At the back of the house (No. 8) is a yard used in common by the tenants of No. 8 and two other houses abutting thereon. Three pail closets are now placed at the opposite end of this yard, but there was, until quite recently, a privy midden, marked M. in the plan above. This midden had been in use since 1858, its contents being removed periodically every three months or so. The contents were always reported by inspectors as "wet" or "very wet." In March 1893 it was decided to abolish the old midden. *The work of demolition was commenced on the 25th March and was completed the 12th April.*

Distribution of infectious disease in town.

I have had a plan of the north-west section of the town of —— supplied to me by the courtesy of the Acting Medical Officer of Health, showing the position of houses from which cases of erysipelas, and of houses from which cases of scarlatina, were notified during the period from the 1st March to the 17th April. The plan shows that, during that period, eight cases of erysipelas were notified in the north-west section of the town from eight different houses, and thirteen cases of scarlatina from eleven houses. Five of the seven houses (excluding the H.'s) in which the cases of erysipelas occurred were within half a mile of the H.'s and five of the eleven houses in which the cases of scarlatina occurred were within the same distance.

The Medical Officer of Health has also supplied me with a list of all infectious diseases notified during the first four months of 1893. From this one gathers that there was a considerable number of cases of erysipelas about the town at this time, which disease is included in the compulsory notifications. There were 9 cases notified in January, 13 in February, 10 in March, and 8 in April, making a total of 40 cases notified in the first four months of 1893, as compared with 30 cases in the corresponding period of 1892. Of the 10 cases in March, five arose in the north-west quarter of the town, where the H.'s dwell, and of the eight cases in April two were in that quarter. One of these latter occurred in the same street. A man named J. G., aged 32, living at No. 18, about 100 yards from the H.'s, was attacked with redness and swelling of his ankle on the 13th March (four days before the advent of the disease in the baby); he was seen by the doctor (Dr. D.) on the 4th April, who at my interview with him did not seem quite sure that the case had been after all one of erysipelas, but who nevertheless so notified it on the 6th April.

The child's history.

The history of the child W. H. was as follows:—

Nov. 18th. He was born on Tuesday, the 18th November 1892. The labour was natural, and the child evidently a very healthy one. The mother nursed him up to the date of his death.

March 14th. On the 14th March the baby, being then nearly four months old, was vaccinated by a private practitioner, Mr. G. H. W., at his surgery in the town. Two insertions were made, and the lymph used, to the best of the doctor's recollection, was calf lymph obtained from Dr. Renner's establishment. The mother says no other child was there at the time, so it could not have been from arm to arm. The following Tuesday the baby was taken again to the surgery for inspection. The vesicles had matured. They were not touched, and no lymph was taken from them. Mr. G. H. W. has supplied me with a list of the names and addresses of other cases he vaccinated during the month of March, but no erysipelas has occurred amongst these. The baby's vaccination seems to have run the normal course in every respect, the mother occasionally putting on a little "cream" or "Fuller's earth," but no regular dressing or shield was used. The mother states that the "two scabs came off" on Sunday, the 2nd April. Fresh scabs afterwards formed, and were present at the time of my inspection of the body on the 21st April.

April 4th. On Tuesday, the 4th April, the child, being then in his usual good health, was taken with convulsions in the evening, and again on Wednesday morning, the 5th April, lasting three hours. Dr. J. W. was called in, and on Wednesday evening a redness was noticed around the vaccination marks, which on Thursday, the 6th April, had reached to the elbow, and on Friday, the 7th April, to the wrist. The whole arm and face were gradually involved by the redness and swelling; the child was restless and thirsty, but no fresh symptoms appeared, and he died apparently of weakness at 8.40 a.m. on Tuesday, the 18th April, exactly five calendar months after his birth, five weeks after his vaccination, and two weeks after the advent of the erysipelas.

Autopsy. On Friday evening, the 21st April, three and a half days after death, I visited the house with Dr. J. W. and inspected the body. It was that of a well-grown, well-nourished child. There was still well-marked œdema of the left arm and left side of the face; none on the right arm. There was universal jaundice of the skin. Two vaccination scabs about the size of threepenny pieces were on the left arm, which could be easily removed, showing new skin which had formed beneath. On the 22nd April at 10 a.m., with Dr. J. W., I made a post-mortem examination. Decomposition was somewhat advanced. All the organs were congested, and owing to the state of the weather somewhat decomposed. The blood was fluid and dark. Otherwise there was no abnormality discoverable to the naked eye in any of the organs.

Cause of death. (I.) In view of the history of the illness and post-mortem examination the death of W. H. was evidently due to acute erysipelas.

Disease not inoculated. (II.) The long interval (three weeks) between the vaccination and the advent of erysipelas renders it highly improbable that the *operation of vaccination* was the means of introducing the erysipelatous poison into the system, even apart from the important fact that several other babies were vaccinated from the same source without any such result. In Fehleisen's cases (Microparasites in Disease, page 283; New Sydenham Society) of experimentally produced erysipelas, the longest incubation period was 61 hours, the shortest 15 hours.

Predisposing causes. (III.) Powerful predisposing causes of erysipelas existed in this case, viz.:—

(*a*) The child lived in an overcrowded, ill-ventilated house.

(*b*) The inmates were of dirty habits, and the general surroundings of the child's life unfavourable.

Origin of virus. (IV.) The origin of the erysipelatous poison may have been—

(*a*) Infection from a pre-existing case in the neighbourhood, though it cannot be shown that the mother or child were in communication with any infected house; or

(*b*) The opening up of the old privy midden, which corresponded in point of time with the advent of the child's illness. The process of demolition of the privy was commenced on the 25th March, and was continued up to the 12th April. The child's scabs came off on the 2nd April, and he was taken with convulsions heralding the erysipelas on the 4th April.

Portal of introduction of poison. (V.) The portal through which the poison (contagium) of erysipelas was introduced into the child's system was probably the vaccination scars; because

(*a*) The mother clearly describes the blush as having started around the vaccination scabs, and

(*b*) The first scabs came off just two days before the advent of the erysipelas.

Conclusion. In view, therefore, of all the circumstances of the case, it seems that vaccination was only very slightly, and very indirectly, a causal factor in the fatal termination. It should be borne in mind also that any accidental scratch, scarcely visible to the naked eye, would probably have served equally well as the portal for the introduction of the erysipelatous poison into the child's system; and that the child was pre-disposed to contract erysipelas by reason of the insanitary conditions surrounding him.

Whether the source of infection arose from a pre-existing case of erysipelas, or from the recently opened privy-midden, there is no decisive evidence to show. Most careful investigation failed to establish the former, and on this and the other grounds already mentioned I am inclined to favour the latter view.

In conclusion, I wish to acknowledge the courteous assistance received from Mr. J. R., the Acting Medical Officer of Health, and Dr. J. W., who attended the patient.

THOMAS DIXON SAVILL, M.D.

CASE 245, REPORTED TO THE COMMISSION BY MR. J. H. LYNN.

Case of B. G. E.: report to the Commission of Dr. Arthur Pearson Luff.

In April 1893 I was requested by the Commission to investigate the circumstances attending the illness of B. G. E., of ——, and the alleged connexion of the illness with vaccination.

Mr. J. H. Lynn's letter of the 21st April 1893 informing the Commission of the case stated that "B. G. E., of "——, was born on the 6th November 1892, and was "vaccinated 6th March 1893, by Dr. F., Public Vacci- "nator, from a child's arm He was quite well before "the operation. On the tenth day he showed symptoms "of illness. The vaccinated arm became very much "swollen and inflamed and the skin was raised in watery "blisters like a scald. The swelling and inflammation "spread across his back and other arm. He is now suffer- "ing from discharge from the ear, and abscess under arm, "and bronchitis through being undressed so many times "to attend to his arm. The child was taken to St. Mary's "Hospital, where the doctor said he was suffering from "inflammatory condition of the arm following vaccina- "tion. An eruption followed of humoury spots all over "his head. The doctor told the nurse it was a most "peculiar condition and he had never seen anything like "it before. The parents are healthy, and the other four "children. (One child died of pneumonia at the age of "thirteen months.) At the time of the vaccination several "mothers said it was 'a lovely baby for that age' (four "months); and the following week a person asked the "mother if she would mind her baby being done from "him. This was agreed to, and the result is that this "second child is now in the doctor's hands. The vac- "cinator said that E.'s child was a fine baby, the best "he had seen that morning; he also said he was a very "strong baby."

I made my inquiry on the 25th and 26th April 1893, first visiting Mrs. E., the mother of the child in question, and also seeing the child B. G. E. I found that the child had quite recovered from his illness, and was looking well; the vaccination marks looked well, and in the left axilla there were the scars of an old abscess which had healed. The mother informed me that the child was taken on the seventh day after vaccination to the Public Vaccinator for inspection; she considered that the child was then well, and he was passed by the vaccinator as a successful vaccination; the child continued quite well until the 10th day after vaccination, when patches of inflammation commenced to form above and below the vaccination marks, and later on an abscess formed under the left axilla; she took him to St. Mary's Hospital on the 18th March, on account of his being weak, but did not mention the condition of the arm until she took him again on the 20th March; the inflammation continued to spread for a few days and extended across the back and over to the right arm, reaching down to about midway between the elbow and the wrist. A small watery vesicle formed upon the inflamed area (this, from the mother's description, and from the account subsequently obtained from the doctor, was an eruption of sudamina). In the mother's opinion the arm was not rubbed by the dress of the child, and, as far as she was aware, was not subject to any undue irritation; she had not dressed it with rags, and she did not know of any cases of erysipelas in the vicinity; three weeks previous to the vaccination two of her children had been seized with scarlet fever of which there was a good deal in the neighbourhood. These two children had been removed to a fever hospital. From her child one baby had subsequently been vaccinated, viz., the child of Mrs. M. of —— (this was the child referred to in Mr. Lynn's letter as being in the doctor's hands on account of vaccination).

b-vac- ce.

I next proceeded to see this child, and found that the vaccination in it had run a perfectly normal course from first to last; that the vaccination marks had well and completely healed, and that the illness from which it suffered, and through which it was undoubtedly in the doctor's, hands was that of acute bronchitis, the existence of which had been in no way connected with vaccination.

I next interviewed Mr. Worth, House Physician to St. Mary's Hospital, who saw and treated the child B. G. E. at the hospital. He informed me that he first saw the child on the 20th March, 14 days after the vaccination; the vaccination spots were then scabbed over, but there was an inflammatory redness round them, which redness extended down the arm nearly to the wrist, and the glands of the axilla became swollen; the arm gradually got worse, and by degrees the inflammation extended across the back to the opposite arm, which, however, was only slightly effected. The child was seen also by Dr. Bird, the Medical Superintendent of St. Mary's Hospital, and although the rash was considered from the 20th March as probably of an erysipelatous nature, the diagnosis of erysipelas was not absolutely made until the 27th March, when, in the opinion of Dr. Bird and Mr. Worth, it was an undoubted case of erysipelas.

Vaccinifer and co-vaccinee.

I next saw Dr. F., of ——, Public Vaccinator, who had vaccinated the child B. G. E. He informed me that it was an arm-to-arm vaccination, the vaccinifer being H. T., of ——.

I saw this child and found her to be a healthy child in whom the vaccination had run a normal and successful course. From this vaccinifer eight children were vaccinated in addition to B. G. E., and at the same time, viz.:—B. R., of —— , E. S., of ——, G. F., of ——, E. C., of ——, S. E., of ——, W. A., of ——, L. E., of ——, and E. P., of ——. I saw all of these children, and in each of them the vaccination had run a normal and successful course, and had been attended with no complications whatever. I had previously made an inspection of the sanitary arrangements of E.'s house, and found them to be in a good and satisfactory condition.

Conclusion.

The illness from which the child B. G. E. suffered was undoubtedly an erythematous inflammation around and spreading over the vaccination marks, followed by erysipelas. In my opinion, neither the erythema nor the erysipelas were due to inoculation with impure vaccine lymph, for the following reasons:—

(i.) The inflammation did not commence around the vaccination marks until the 10th day after vaccination.

(ii.) The inflammatory condition was not recognised as erysipelas until the 21st day after vaccination.

(iii.) The vaccinifer was a healthy child who had never had erysipelas, and in whom the vaccination had run a normal course.

(iv.) The eight other children vaccinated from the same vaccinifer as B. G. E. never suffered from either erythema or erysipelas, and in each of them the vaccination ran a normal course.

(v.) The one child vaccinated from B. G. E. on the seventh day after vaccination did not suffer from either erythema or erysipelas, and the vaccination ran a normal course.

ARTHUR PEARSON LUFF, M.D.

CASE 246, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of W. C.: report to the Commission of Dr. Arthur Pearson Luff.

In May 1893 I was requested by the Commission to investigate the circumstances attending the death of W.C., late of ——, and the alleged connexion of the death with vaccination.

The entry in the register of the death of the child was to the effect that W. C., aged one year, died on the 29th April 1893, the cause of death being certified by Dr. A. M. B., of ——, as "emaciation." The registrar of births and deaths at ——, when forwarding a copy of this entry to the Local Government Board, informed the Board as follows: "Enclosed I forward you a certified "copy of the entry of a death I registered to-day. The "informant, the father, H. C., stated that the 'emacia- "tion' as entered in column 6 was the result of vacci- "nation, and that the doctor who signed the certificate "told his wife that this child had been vaccinated off a "rotten child. As the father was so confident of the cause

" of the 'emaciation,' although the medical certificate did " not disclose it, I deemed it advisable to notify the case " to the Local Government Board."

On the 11th May 1893 I proceeded to —— and first saw the parents of the deceased. They informed me that the child was in good health before vaccination, and was comparatively a fine child; that he was vaccinated on the 20th December 1892 by Dr. M., the Public Vaccinator at ——, and was vaccinated in four places on the left arm; that the vaccination went on well until 18 days after vaccination, when three of the four scabs fell off, and an abscess began to form in the left axilla and discharged; the child during this time, *i.e.*, from the 18th day after vaccination, was sick at times, but did not suffer from diarrhœa or convulsions. On the 13th January (24 days after vaccination) the child was first taken to Dr. A. M. B., who told the parents, according to their statement, that " it was a very bad corruption "; the child was treated with medicine and a local application, and a month later all the places were healed. Subsequently he gradually pined away and died on the 29th April (four months after vaccination). The vaccination marks had been completely healed for two months previous to death, and the inflammatory and ulcerated conditions had also entirely disappeared previous to that period. The mother thought that the sleeve of the dress did not rub against the vaccination marks. In the rear of the house, and about 20 feet from it, is a privy to which is attached a small cesspool; this cesspool is emptied twice a week, and the privy was not in what I should describe as an unsanitary condition. The mother informed me that the child was fed at the breast till he was six weeks old, and after that was brought up almost entirely on Ridge's food made with water only.

I next proceeded to interview Dr. A. M. B., of ——. He informed me that when the child was first seen by him (24 days after vaccination) there was an inflammatory thickening around the vaccination marks, and a pustular or bullous eruption on an inflamed base, extending over an area of about 6 inches, across the left side of the chest near the shoulder. The inflammation was erysipelatous in appearance, but he should not say it was erysipelas; he did not say that the " child had been vaccinated off a rotten " child," but said that it was some form of blood-poisoning, the source of which he did not know and could not state; he treated the child with large doses of iron internally and calamine ointment externally; the bullæ completely healed; no axillary abscess formed at any time; after the recovery of the child he did not see him again for one month, when he was called in suddenly to see him and found the child very emaciated and with œdema of the feet and hands; the mother informed him that the child had been slowly pining away.

I next proceeded to see Dr. M., the Public Vaccinator, who vaccinated the deceased. He informed me that he vaccinated the child on the 20th December 1892, the vaccinifer being F. S., of ——, and that he vaccinated at the same time and from the same source, in addition to the child W. C., a second child, L. B., of ——.

Vaccinifer and co-vaccinee

I saw both of these children, and found them to be healthy children in whom the vaccination had run a normal course, and had been attended with no complication whatever.

Conclusion.

In my opinion the death was due to wasting from insufficient and improper nutrition, the child having been fed from the time when he was only six weeks old upon Ridge's food made with water, and consequently, being incapable of digesting what was mainly a starchy food, he gradually wasted and finally died, as certified, from emaciation.

I do not think that the illness from which the child suffered after vaccination was directly connected with his death. This illness, in my opinion, was of an inflammatory character, the inflammation being probably due to some septic absorption from the vaccination marks; it was not, in my opinion, due to inoculation of impure vaccine virus, for the following reasons:—

(i.) The inflammation did not commence until the 18th day after vaccination, when three of the four scabs came off.

(ii.) The vaccinifer of the child was a healthy child in whom the vaccination ran a normal course; and

(iii.) The other child vaccinated from the same vaccinifer, and at the same time as the deceased, remained healthy, and her vaccination also ran a normal course.

ARTHUR PEARSON LUFF, M.D.

CASE 247, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of S. H.: report to the Commission of Dr. Sidney Coupland.

S. H., aged one month, of ——, died on the 17th May 1893, the cause of death being certified by Mr. A. H. R. as " vaccination, nine days; cellulitis (general), six days; " pneumonia, two days."

In making inquiry into the above case on the 27th May 1893, I first called upon Mr. A. H. R., medical practitioner, of ——. He told me that he was called in to see S. H. on the 12th May, three days after the vaccination. He found the infant suffering from high fever, much œdematous swelling of the arm around the site of vaccination, and a diffuse redness spreading thence over the shoulder to the back. At that time there were well-marked vaccine vesicles present. Mr. A. H. R. was struck with the intensity and extent of the inflammation, which after a few days' treatment subsided a little, but the redness (erysipelas migrans) continued to spread over the back as far as the scrotum. The eruption was not accompanied by bullæ, and the œdematous condition was confined to the upper arm, shoulder, and upper part of the back. Mr. A. H. R. said that the child had been healthy since birth, and that so far as he knew there was no scarlet fever or other epidemic disease prevalent in the district at that time. On the 15th May signs of double basic pneumonia appeared, and the infant died on the 17th.

I next called on Mrs. H., the mother of the infant S. H., at ——, where she and her husband had lived since the 19th November 1892, occupying a single room in the basement of the front of the house, about 15 feet by 8 feet, and lighted by a window opening in an area sunk some 5 or 6 feet below the level of the small " garden " in front of the house. I noticed that there was a trapped gully just below the window in this narrow area (it was only 2 feet in width), and Mrs. H. informed me that lately they had noticed some " bad smells " arising from this drain. Mrs. H. is 24 years of age, and her husband 28 years; he is a labourer by occupation. They have one other child, a girl, now 19 months old, who has been delicate since measles in her early infancy, and is now subject to otorrhœa. This child was vaccinated at the age of six weeks, with no ill result. The mother gave me the following account of her infant S. H.'s illness:—

He was born on the 24th March 1893, and seemed to be a healthy infant. On the 9th May he was taken by his mother to the public vaccination station at ——, where he was vaccinated by Dr. H. K. There were four insertions made, and Mrs. H. thinks that four or five other infants were vaccinated at the same time from the arm of the same child as hers had been. That evening she noticed a patch of redness over the left shoulder and neck of her infant, who passed a restless night, and next morning the redness had extended " right across the shoulders." She sought advice of a chemist on the 10th, but as there was no improvement in the child's condition she called in Mr. A. H. R. on the 11th. The rash spread over the front as well as the back of the trunk; Mr. A. H. R. attended on the 14th and 15th, and the infant died on the 17th, the rash continuing to spread over the whole body.

I next called upon Dr. H. K., the Public Vaccinator, who showed me his register, from which I gained the following information respecting the vaccinifer and co-vaccinees of S. H.:—

No. 303 in the register,	A. S. P.,	vaccinated	May	2nd.
No. 406	,,	,,	B. B.,	,,	,,	9th.
No. 407	,,	,,	S. H.,	,,	,,	9th.
No. 408	,,	,,	E. D.,	,,	,,	9th.
No. 409	,,	,,	E. M. E.,	,,	,,	9th.

All these, with the exception of No. 407, S. H., the subject of this report, were seen by Dr. H. K. on the eighth day and were doing well.

Method of vaccination.

Dr. H. K. said that he always made four insertions, using a special " vaccinating lancet " with rounded off extremity; and making the " portcullis " scratching of the skin prior to transferring the lymph which he takes direct from the vesicle upon the lancet. After each vaccination the lancet is dipped in water and carefully wiped with a clean cloth. He did not know of any other cases of erysipelas, and had indeed been noticing how well the vaccinations had taken, hardly any areola being found around the vesicles. He informed me that the room (——) in which the vaccinations were preformed was commodious, light, and

well ventilated, and that it was swept daily with carbolic powder.

cinifer co- inees. I next proceeded to call on each of the co-vaccinees and the vaccinifer, and was fortunate in seeing them all.

A. S. P., of ——, the vaccinifer. Born on the 23rd January 1898; vaccinated on the 2nd May. A healthy child, one of a family of seven. The vaccination had been done rather high up on the shoulder and presented three adherent scabs (one had already fallen off). Mrs. P. said this was the "best arm" of any of her children. From this child lymph was taken for the direct arm-to-arm vaccination of the child S. H. and of the following:—

B. B., of ——. Born on the 6th March 1893; vaccinated on the 9th May in four places, of which only one took. She was accordingly re-vaccinated on the 17th from the other vesicle; but neither of the two insertions then made were successful in producing vesicles. There was no redness about the insertions, and the single scab was still adherent at my visit.

E. D., of ——. Born on the 12th February 1893; vaccinated on the 9th May. Each of the four insertions had taken, and the mother said there had been no trouble with the arm. She had covered it with a piece of muslin. At my visit the scabs had been detached from two of the places, and still adhered to the other two. They were perfectly natural.

E. M. E., of ——. Six years of age; vaccinated (primary) on the 9th May 1893; there were four insertions, but all were unsuccessful. She was again vaccinated on the 16th, but only one vesicle (with a large areola) resulted.

None of the children vaccinated from A. S. P. were used as vaccinifers.

clusion. Thus of the four children vaccinated from A. S. P., one was perfectly successful, one took in one place only, one was a failure, and one, S. H., the subject of this report, died. However, the absence of any inflammatory complication in all the cases but that of S. H. must acquit the lymph itself of blame. The history of his case, the early onset of the erysipelas, is strongly suggestive of septic infection at the time of the operation, but there is no evidence in support of this; and I am more inclined to believe that the recent wounds were infected at his own home, the conditions of which were (unlike any of the others I visited) decidedly insanitary.

SIDNEY COUPLAND, M.D.

CASE 248, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of E. K.: report to the Commission of Dr. Arthur Pearson Luff.

In June 1893 I was requested by the Commission to investigate the circumstances attending the death of E. K., late of ——, and the alleged connexion of the death with vaccination.

The entry in the register of the death of the child was to the effect that E. K., aged two months, died on the 20th May 1893, the cause of death being certified by Dr. A. C. J. W., of ——, as "vaccination, 27 days; erysipelas, 10 " days."

I proceeded to —— on the 17th June 1893, and I found that deceased was vaccinated by Dr. A. C. J. W. on the 24th April in four places on the left arm, the vaccination being done with a tube of lymph which had been filled the same day with lymph taken from the arm of A. C., and, at the same time and with the same lymph, another child, H. B., was vaccinated; both these children were inspected on the eighth day after vaccination, when the arms were both going on well, and the vaccinations were passed as successful.

I visited the cottage at ——, where the deceased had lived, and saw Mrs. K., the mother of the child; she informed me that the vaccination was, in her opinion, a very successful one, and was going on in a natural and healthy way until the 17th day after vaccination, when erysipelas started around the vaccination sores and spread over the arm, and then affected the body. At the time that the erysipelas commenced the vaccination sores were scabbed over, but there was no discharge from them. The child was seen several times by Dr. A. C. J. W., who informed me that it was undoubtedly erysipelas. Two persons were suffering from erysipelas about that time at the house belonging to Mrs. K.'s uncle—about a mile and a half off—but from Mrs. K.'s statement no visits had been interchanged between the two houses for some weeks previous to her child contracting the erysipelas.

Sanitary surroundings. The sanitary arrangements of the house were not good, there being in the immediate rear of the cottage a rather foul open cesspool, and near this a drain, receiving sink-water from the adjoining house, and through which gases could gain access to the house, the discharging pipes from the sinks not being trapped.

Vaccinifer and co-vaccinee. I next visited A. C., the vaccinifer, and found him to be a healthy child, in whom the vaccination had pursued a normal and successful course; and I afterwards proceeded to see H. B. (the only other child vaccinated at the same time and from the same source as the deceased) in whom I found that the vaccination had run a normal and successful course, and the vaccination places had quite healed.

Conclusion. The deceased, E. K., undoubtedly died of erysipelas, which commenced 17 days after vaccination, and proved fatal on the 27th day. The production of the erysipelas was not due, in my opinion, to inoculation with impure vaccine lymph, for the following reasons:—

(i.) Erysipelas did not make its appearance until the 17th day after vaccination.

(ii.) The vaccinifer was a healthy child in whom the vaccination ran a normal course, and who had never suffered from erysipelas; and

(iii.) The only other child vaccinated from the same source as the deceased remained healthy; his vaccination ran a normal course, and he did not suffer from erysipelas.

The source of the erysipelas was either from the cases at the uncle's house—where there was erysipelas at the time—or from the bad sanitary arrangements of the cottages, in one of which the child lived.

ARTHUR PEARSON LUFF, M.D.

CASE 249, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of N. H. D.: report to the Commission of Dr. Theodore Dyke Acland.

Vaccination. N. H. D., of ——, aged seven months, was vaccinated on the 1st March 1893, in four places, privately by Dr. H. W.

Death. 25th May 1893.

Certified cause. "Septicæmia following vaccination, two months and 25 " days; axillary abscess and erysipelas, one month."

Certified by. Mr. H. W., M.D.

Source of lymph. The lymph was obtained from Messrs. S., of ——, from whom Dr. H. W. received five tubes on the 20th February and also five tubes on the 28th February. These tubes are believed to have contained Dr. Renner's calf lymph, and to have been part of two consignments of lymph received by Messrs. S. from Dr. Renner on the 8th and 23rd February, and numbered respectively —— and ——. Messrs. S. inform me that they never keep their lymphs long in stock, always using up the old tubes and preferring to telegraph for new supplies rather than to write. They supply no other calf lymph but Dr. Renner's, and rarely sell any humanized lymph. It may, however, be stated that humanized lymph is kept in the same desk and in a wooden box which is identical with that in which the calf lymph is stored. Both these boxes were fully and properly labelled, and the assistant who gave me the information believes that it is practically certain that the lymph supplied was calf lymph.

Co-vaccinees. From the above statement it is evident that the source of lymph is not certain, so that it is also uncertain who the co-vaccinees were. Dr. H. W. believes that the child N. H. D. was vaccinated from the second batch of five tubes, and that with the remaining tubes five constables were re-vaccinated at ——. These cases were all without complication. Five other constables were vaccinated with the first batch of lymph. Of these, one, No. 957, was off duty for three days during the second week suffering from con-

siderable inflammation of the arm, which extended down to the wrist. The vesicles did not suppurate, and the axillary glands, although they were enlarged, did not break down. No application was made to the arm except under medical advice, and it was well at the end of the second week after vaccination. There are now (17th June) four small not well-marked scars. Another, No. 868, suffered from slight inflammation round the vesicles not sufficient to incapacitate him from duty. The other cases were without complication.

Sub-vaccinees. None.

Course of vaccination and illness. The child N. H. D. was vaccinated from a single tube of lymph, which Dr. H. W. informs me had not been previously opened and which was used for no other case. Vaccination pursued an abnormal course from the first. The wounds were open and discharging by the eighth day. An axillary abscess formed shortly afterwards. This was opened, washed out, and drained. Subsequently other collections of pus formed in the axilla, these were opened, and the suppurating cavities drained. This condition continued without material improvement for nine weeks. The child was then seen by Mr. T., assistant surgeon to the —— Infirmary, who found some diffuse erythema on the chest and arm, to which he did not at the time attach much importance, but a fortnight later well-marked erysipelas commenced, and there was evidence of general septic infection with jaundice and endocarditis, from which condition the child did not rally. The exact dates of the course of the child's illness are uncertain, as no written record was kept by Dr. H. W. at the time, but the general sequence of events was as above recorded.

reatment of vesicles. The child was attended during the whole of his illness by Dr. W. H. and no treatment was adopted except under his advice.

Method of vaccination. An ordinary lancet was used, which was kept in a case with one other and used for no other purpose. One of these lancets at the time of my visit (17th June) was not clean and the surface of the other was rough and the edge uneven; but Dr. H. W. assures me that he is very careful to wash them with carbolic acid lotion and that he does so frequently. He was not attending any case of septic infection at the time that he performed the vaccination.

Previous history. There had been considerable difficulty in rearing the child from birth. His mother was not able to nurse him. Various ways of feeding him were tried. He did not, however, thrive but became much emaciated; the motions were white and green, and there was considerable constipation and frequent vomiting. No doctor saw the child until about a month before he was vaccinated; the food was then changed to barley water with pancreatic emulsion, and under this treatment some improvement in his general condition took place. His health was, however, much impaired, and vaccination was consequently postponed for a month and was not performed until Dr. H. W. thought that the child was in a fit state.

Family history. The mother is delicate. She suffered from puerperal septicæmia after her confinement, and was ill for many weeks. The subject of this report is the only child. The father is believed by Dr. H. W. to be healthy.

General surroundings. Reasonably good.

Sanitary condition. The condition of the house is reported by the Sanitary Inspector, whom I saw, to be good. He had investigated the condition of the drains when Mrs. D. was suffering from puerperal fever and found no defect. It should, however, be noted that Nurse S., who attended Mrs. D. during her confinement, and afterwards nursed her through her illness, states that she often noticed a close, offensive smell in the privy inside the house, and that she had to use carbolic and other disinfectants. Owing to their absence from —— I was unable to see either Captain or Mrs. D., but I have heard from them since that they have nothing to add to the account given to me by Dr. H. W. of their child's illness.

Conclusion. The child N. H. D. died, as stated in the certificate, of septicæmia consequent upon suppuration of the vaccination wounds and axillary abscess. Owing to the uncertainty as to the particular tube of lymph which was used for vaccinating the child, it did not seem that any useful purpose would be gained by tracing the various batches of lymph from which it might have been taken. It should be noted that if Dr. H. W.'s supposition is correct that he used one of the second batch of five tubes obtained from Messrs. S., all the other cases did well; but of the first batch of five tubes the vaccination of two out of six persons pursued an abnormal course, there being in both cases some excess of inflammation round the vesicles. In the case of the child N. H. D. the early appearance of suppuration at the seat of vaccination is in favour of the view that its abnormal course may have been due to the condition of the lymph or to some act of the vaccinator at the time that the operation was performed. The fact cannot be disregarded that the operator's instruments were not in unexceptionable order when inspected; and it must also be noted that the child had never since birth been in good health, and further that his mother, who was confined in the house where the child was vaccinated, had suffered from septic infection after her confinement. It is thus probable that more than one cause contributed to the fatal result, although vaccination was the starting point of the septic infection.

THEODORE DYKE ACLAND, M.D.

CASE 250, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of T. H. N.: report to the Commission of Dr. Theodore Dyke Acland.

Vaccination. T. H. N., formerly of ——, now ——, aged nine weeks, was vaccinated in four places by Mr. F., Public Vaccinator, on the 20th April 1893.

Death. 14th May 1893.

Certified cause. "Bronchitis; enteritis."

Certified by. Mr. W. H. F. N., L.S.A.

Inquest. 17th May 1893.

Verdict of coroner's jury. "The said T. H. N. being an infant nine weeks old, on "the 14th May 1893 at —— aforesaid did die from pyæmia "after twenty-fourth day of vaccination, and from the "medical evidence such pyæmia would most probably arise "from the vaccination having run together and caused "much matter and inflammation."

Source of lymph. Direct from the arm of A. J. C., No. 249 in the register.

Vaccinifer. A. J. C. is a fairly nourished child, lively and apparently well, but rather anæmic, and with some catarrh. It is clean and well kept. Vaccination was performed twice, the first time on the 6th April unsuccessfully, the second time on the 13th April with the same lymph successfully, and without complication of any kind. There are now (18th June 1893) three small healthy-looking scars. This child was vaccinated with Faulkener's calf lymph, obtained through Dr. B., of ——, from Messrs. W. and Sons. Two other children were also successfully vaccinated with the same lymph.

Co-vaccinees. Four. One, E. M., a private case in which vaccination pursued a normal course; and three at the public station, Nos. 283–5 in the register. Besides these cases lymph was taken and stored on points, and one tube was filled, but the exact number of points which were taken, and whether they were taken before or after the children had been vaccinated from A. J. C.'s arm, and for what cases they were used, I was not able, with any certainty, to discover. The three children who were vaccinated direct from the arm of A. J. C. were as follows:—

(1.) G. O., No. 285. A large child, rather too fat, with eczema of the head, from which he had suffered previous to vaccination. The wounds are now (18th June) covered with eczematous scabs. The arm had been injured some few weeks previously, the stuff frock having stuck to the scabs and torn them off. The child, except for the eczema, is now in good health.

(2.) E. S., No. 284. A healthy-looking child in whom vaccination was without complication. She has now four normal scars.

(3.) H. E. B., No. 285. A healthy-looking child in whom vaccination was without complicatson of any kind. Four insertions were made, and there are now only two small scars, which are too close together, but otherwise normal.

All the above children were vaccinated with an Arnold's scarifier, the lymph being rubbed in with a lancet.

Sub-vaccinees. None. The vesicles were not opened.

Course of vaccination and illness. Considerable discrepancies appear in the statements made by Mrs. N., the mother, and Mr. F., and the evidence

given at the inquest as to the dates in connexion with the child's illness; but the following general sequence of events seems to be admitted by all. During the first week the arm went on well, and was not noticeably inflamed on the eighth day when the child was taken for inspection. On the tenth or eleventh day the arm had inflamed down to the elbow, and there was some brawny swelling, but with no discharge from the wounds. On this date Mr. F. saw the child, and, in a letter to me, states, "that the "normal course of the pocks had been interfered with, as "the scabs had been all rubbed off when the mother "brought the child to the surgery . . . . It was "then so seriously ill from bronchitis that I deemed "it necessary to give it an emetic. It was afterwards "treated for bronchitis, and diarrhœa eventually set in, "and afterwards enteritis, both of which complaints were "verified by the medical man who made the post-mortem. "The following day my assistant saw the child, and "bronchitis was still the only complaint to cause any "anxiety."

On that day both Mr. W. H. F. N. (Mr. F.'s assistant) and Mrs. N., the mother, agree in stating that the four original pocks had coalesced, and that a ring of secondary vesicles had formed round them. These subsequently became confluent with considerable induration and tension of the soft parts. Mr. W. H. F. N. opened some of these pocks to relieve the tension and ordered poultices to the wounds. He states that the child had some bronchial catarrh about this time, and that four days later the child was kept out till nine o'clock in the evening. Mr. W. H. F. N. informs me that he thought there was septic absorption going on from the arm from the first day on which he saw the child (3rd May), and that the child was suffering from cellulitis, and that he treated him accordingly. The inflammation spread down the arm as far as the wrist, and there was some erythema on the body and on the right foot. After death a sore was found on the right foot, which Mr. H., who made the post-mortem, informs me might have been caused by one of the applications which was made to the part. On the 8th May the child was found to be suffering from umbilical hernia, and was treated for it by Mr. F.'s dispenser. On the next day Mr. W. H. F. N. detected fluid in the left pleura, and wanted to tap it, but was not allowed to do so by Mrs. N., the mother. From this date the child's condition continued to get worse, and he died without being relieved on the 14th May.

st-rtem mina-n.

The post-mortem was made by Mr. H. It adds nothing material to the above history. The left pleural cavity was found to be full of fluid, the lung compressed and collapsed. There was pneumonia of the lower third of the right lung, and broncho-pneumonia of the upper part. The bowels were much distended, the liver and spleen enlarged, and the kidneys soft and friable. Mr. H. informs me that he did not doubt that the child died of septic infection.

eatment vesicles.

Fresh cream was applied with a feather after the eighth day, and subsequently under medical advice the arm was poulticed and treated with boracic lotion and covered with protective. A new shield was used for some days, but does not seem to have produced any irritation. When I saw it, it was clean, and only very slightly soiled with pus on one spot. The sleeve of the dress was not taken out until after the arm had begun to inflame, but I could not elicit any facts which would lead me to suppose that it had caused irritation of the wounds.

thod of cination.

Vaccination of all the children, Nos. 283–5, was performed with an Arnold's mechanical vaccinator. To clean this instrument between each vaccination is practically impossible, and in the present instance was not attempted. When I saw it one of the blades was distinctly soiled, and I cannot but think that its use must be attended with considerable risk.

erious tory.

Good.

mily tory.

Not good, the mother has twice, I am informed by Mr. F., shown signs of insanity, but I was not able to ascertain any facts bearing upon this case.

itary dition.

Not good. At the time the child was vaccinated the parents lived in a cottage the surroundings of which were insanitary, and such as might prove a source of serious danger to any open wound. Almost immediately opposite the door was a large collection of house refuse and cinders containing much decayed vegetable matter. Since the child was vaccinated the parents have removed to their present house in which I could not detect anything amiss.

clusion.

The child T. H. N. died, as found by the jury, of pyæmia, and there is no reasonable ground for doubting that the pyæmia was the consequence of suppuration which occurred in and round the vaccination wounds. Whether the primary irritation was set up by the use of an instrument which had already been used for many vaccinations without being cleaned, there is no direct evidence to show. A direct cause of suppuration round the vesicles seems to have been a development of numerous supernumerary pocks which became confluent, and it is probable that the vesicles were irritated by the application of cream with a feather, and possibly also by the poultices. From the subsequent history of the case it would at least seem doubtful whether the catarrh from which the child was suffering on the eighth day after vaccination in any way materially contributed to his death. The empyema, for such it practically was, and the pneumonia from which eventually the child died, having developed less than a week before its death.

THEODORE DYKE ACLAND, M.D.

CASE 251, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of I. J. E.: report to the Commission of Dr. Arthur Pearson Luff.

In June 1893 I was requested by the Commission to investigate the circumstances attending the illness of I. J. E., of ——, and the alleged connexion of the illness with vaccination.

The following letter had been received by the Local Government Board:—

"*Re Vaccination Acts.*

1st June 1893.

"To the Right Honourable H. H. Fowler, M.P., President of the Local Government Board.

"SIR,

"ON behalf of Mr. and Mrs. E., of —— Hall, ——, about 4 miles from ——, I beg to call your attention "to the case of their child 'I. J. E.,' about seven months "old, who was vaccinated on 3rd April last, and has since "suffered with a rash all over his body, and more recently "from severe inflammation of the arm, with abscesses. "The child looked very ill when I first saw it on "8th May, and it had one abscess on the elbow when I "saw it for the second time on 21st May. The mother "informed me on 8th May that a week or so previously "the doctor did not give any hope of the child living. "The mother is much grieved as she stated to me that she "quite believes she had the only other boy of her family "killed by vaccination some little time ago. This child "(I. J. E.) was quite well previous to vaccination.

"I regret further to have to complain to you of the "prosecution by the —— Guardians, and also by those of "the —— Union, of conscientious objectors to vaccination at —— and ——. It is also to be regretted (especially seeing the Royal Commission is still sitting) that "the —— and —— Guardians have resolved to renew "prosecutions in their respective districts. These steps "can have but one effect, that of intensifying the hatred "of vaccination, and the opposition to these tyrannical "and odious Acts, which are very largely latent, and "which, when formulated, cannot but become very "general.

"I venture to hope that the very reasonable desire of "these persecuted persons to be left alone and unmolested may be scrupulously respected and regarded.

"I am, Right Honourable Sir,

"Yours respectfully,

"W. T. M."

I proceeded to —— on the 9th June 1893 and went first to see the child I. J. E., of ——, a village about seven miles from ——. Mrs. E., the mother of the child, informed me that he was vaccinated on the 3rd April, and that on the 10th April (seven days after vaccination) matter was removed; up to that time the child's arm had been going on well, but after the removal of the matter there was a slight discharge from the places, and 14 days from the removal of the matter there was some inflammation around the vaccination spots which extended down to the hand, and to a slight extent across the back; the child was feverish when this inflammation commenced, was sick at times, and once had convulsions; directly after the removal of the matter the mother of her

own accord applied bread poultices and home-made lard to the vaccination sores, and also, at times, dry rags were placed over the sores, which were changed twice in the 24 hours after they had become dry and yellow. When Dr. G., by whom the child had been vaccinated, heard of these applications to the arm he advised her to discontinue them, and to use cold-water applications only. The mother stated that a rash something like measles came out over the body of the child on the day after the removal of the matter from the arm, and lasted for two days. A month after the removal of the matter a small abscess formed near the elbow of the vaccinated arm ; this was the only abscess ; there were some lumps for a short time in the axilla of the vaccinated arm, but no abscesses formed there. Mrs. E. informed me that she did not tell Mr. W. T. M. on the 8th May "that a week or so pre- " previously the doctor did not give any hope of the child " living" ; what she did say was that the doctor said that the child was very ill ; she also informed me that she did not connect the death of her other boy with vaccination, and that the statement contained in Mr. W. T. M.'s letter, " that she quite believes she had the only other boy " of her family killed by vaccination some little time ago," is not in accordance with what she said or what she believes; she informed me that the boy referred to was vaccinated when six weeks old ; that he got over the vaccination well, and died three years later, and that she does not believe the death was due to vaccination.

Sanitary surroundings. I inspected the sanitary arrangements of the cottage, a small cottage (Mr. E. being a labourer), although the cottage is referred to in Mr. W. T. M.'s letter as " —— Hall, " —— " ; it was a low built and badly ventilated cottage, 10 feet in the rear was a privy with a very foul cesspool, which Mrs. E. informed me was only emptied once a year, and the smells from it could easily, when the wind was in one direction, gain access to the cottage.

I made a careful examination of the child. I found him to be a fairly healthy-looking child, with four vaccination marks upon the right arm, which had completely healed, and which looked in a healthy condition ; there was no rash upon the child, and the glands in the right axilla were not swollen. Just above the right elbow was a small purplish red patch, which might have been the site of a small abscess; otherwise the child looked in a perfectly normal condition ; was well developed for his age, and was healthy.

I next proceeded to interview Dr. G., who vaccinated and attended the child ; he informed me that he vaccinated him from a tube of Dr. Renner's calf lymph, and that when he saw the child on the 10th April, seven days later, the arm was in a healthy condition, and he removed from it matter to vaccinate other children. He saw the child again on the 27th April, which was the first occasion after the removal of the matter, when he was asked by the parents to see the child ; there was then a slight erythematous blush around the vaccination spots, and the vaccination sores were discharging and in an uncleanly condition from the poulticing and applications employed by the mother. There was no general rash about the body, and no signs of erysipelas. He regarded it as an ordinary case of vaccination in which the sores had got into a somewhat unhealthy condition from the use of improper applications. His son saw it two days later, and then considered that it was going on well and naturally, and did not require further medical attention ; neither he nor his son had at any time stated to the mother that there was " no hope of the child living," as they never at any time considered it to be more than an ordinary case of vaccination, with the slight sloughing that, in his opinion, frequently accompanies dirty or improper treatment of the vaccination scores. As regards the other boy of Mrs. E., that he vaccinated also, and subsequently attended, when the child died three years after vaccination ; that child died of rickets, and his death was not connected with vaccination in any way. From the same tube of calf lymph from which he vaccinated the child I. J. E. he also vaccinated at the same time three other children, viz. :—J. P., of ——; M. D., of ——, and V. E., of —— ; and on the 10th April he vaccinated from the arm of the child I. J. E. the following four children :—F. M., of ——; A. L., of —— ; J. P., of —— , and G. C., of ——.

Co-vaccinees and sub-vaccinees. I saw (although the children lived at considerable distances from one another) and examined these seven children, and found that they were all healthy children in whom the vaccinations had run normal courses, had been perfectly successful, and had been attended with no complications or bad results whatever.

Conclusion. From my examination of the child I. J. E., and from the inquiries that I have made, I am of opinion that the statements made in Mr. W. T. M.'s letter addressed to the President of the Local Government Board, are much exaggerated, and that a colouring is given to them which is not in accord with the facts of the case. To take his statements seriatim I find—

(i.) That the rash all over the body, from which he states the child suffered, was only seen by the mother, and according to her statement was a transient rash that came out the day after the removal of the matter and lasted only for two days.

(ii.) That with regard to the severe inflammation of the arm with abscesses, from which Mr. W. T. M. states that the child had more recently suffered, I found that there was only a slight amount of erythematous redness upon the arm about the vaccination marks, which lasted but a very few days, and which, according to the doctor's opinion, was due to the dirty and improper treatment of the vaccination sores by the mother ; there was the appearance of what might have been one small abscess which had healed near the elbow, but there was no sign of any other abscess, and the mother had never called the attention of the doctor to the presence of any abscess at all.

(iii.) That the statement in Mr. W. T. M's. letter, that the mother informed him on the 8th May that a week or so previously the doctor "did not give any " hope of the child living" is not in accord with fact, either according to the mother's statement as made to me, or Dr. G.'s statement; and

(iv.) That the statement in Mr. W. T. M.'s letter that " the mother . . . . quite believes she had the only " other boy of her family killed by vaccination some " little time ago" is a statement which the mother informed me she never made.

I am further of opinion (1) that the child was never seriously ill after vaccination ; (2) that the vaccination sores were, for a time, in a somewhat unhealthy condition, probably from the application of the dry rags, poultices, and the lard employed by the mother; and (3) that it was a case that did not seriously require inquiry into on behalf of the Commission.

ARTHUR PEARSON LUFF, M.D.

CASE 252, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of S. W. L. : report to the Commission of Dr. Arthur Pearson Luff.

In June 1893 I was requested by the Commission to investigate the circumstances attending the death of S. W. L., late of ——, and the alleged connexion of the death with vaccination.

The entry in the register of the death of the child was to the effect that S. W. L., aged three months, died on the 8th June 1893, the cause of death being certified by Dr. W. R., of ——, as "variola and vaccination ; bronchitis, " 3 days."

I proceeded to —— on the 22nd June 1893 and I found that the deceased child had been vaccinated by Dr. J. M. R. from a tube of calf lymph obtained from Messrs. W. and Sons of —— ; the vaccination was done on the left arm in two places on the 30th May 1893, and both the places took well. On the following day the small-pox rash broke out on the child.

Co-vaccinees. From other tubes of the same batch of calf lymph Dr. J. M. R. vaccinated at the same time three other children. I saw and examined these three children, and found them all in a healthy condition, the vaccination in every case having run a normal course.

The source of the infection of the child S. W. L. with small-pox was very easily traced. I found that the father of the child was employed as a salesman in the firm of M.'s in ——, and that one of the employés there, with whom the father constantly came in contact, had his family down with small-pox about the middle of April.

Mr. L., the father of the deceased child S. W. L., contracted modified small-pox, the rash appearing on him first ; his wife, Mrs. L. (the mother of the deceased), got it from him, and had also a modified attack, the rash appearing on her on the 15th May ; the aunt, Mrs. B., who lived

with them also got it, and had a rather severe attack, the rash appearing on her on the 30th May. The small-pox rash appeared on the deceased child on the 1st June, the day after he had been vaccinated; the attack was of the discrete variety, but the child was well covered with the rash; the secondary fever was rather severe, and Dr. W. R. informed me that he thought that the child would probably have recovered from the small-pox, but for the severe attack of bronchitis which supervened three days previous to death, and which was the main and direct cause of death.

Conclusion. In this case there was obviously no connexion between the vaccination and the cause of death, as the child was vaccinated on the day previous to the small-pox rash appearing on his body, and therefore on the last day of the incubation period. The source of the infection was from one or other of the parents of the child, and was certainly not due to inoculation with impure lymph.

ARTHUR PEARSON LUFF, M.D.

CASE 253, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of A. B.: report to the Commission of Dr. Arthur Pearson Luff.

In June 1893 I was requested by the Commission to investigate the circumstances attending the death of A. B., late of ——, and the alleged connexion of the death with vaccination.

A letter, dated the 13th June 1893, had been received by the Local Government Board from Dr. R. C., from which the following is an extract:—"I have also to "report a death from erysipelas. The child was vaccinated "at —— on the 2nd May, and died on the 29th May "from erysipelas of one week's duration. The child's "name was A. B, residing at ——. 103 cases were vac-"cinated from the same calf, No. ——, with an insertion "success from this calf of 98·86 per cent. Two children "done from this calf returned with sore arms only. I heard "of the case on the 10th June through Mr. L., Medical "Officer of Health for the district in which it died."

On making inquiries the mother stated that the child was vaccinated on the 2nd May, and when taken to Dr. R. C. for inspection on the 11th May was going on well, and was passed by Dr. R. C. as a good and successful vaccination. The child continued to go on well until the 20th May, 18 days after vaccination, when she was slightly convulsed, and on the following day Dr. W. I. was called in and attended till the child died. He states that around the sores, and extending up and above the arm, there was an erysipelatous blush, and the child was in high fever; the erysipelatous blush extended day by day in various directions, viz., across the chest and back, down the other arm, across the abdomen and down the loins, and that the child died on the 29th May. At the time death occurred the neighbourhood of the vaccination marks was free from inflammation, and the pocks were drying up. The case was notified to Mr. L., the Medical Officer of Health for the —— district, at whose direction the sanitary inspector immediately visited the premises, which he found in the following condition, viz.:—Both w.c.'s were dismantled and undergoing reconstruction; the wastepipes to the sinks were improperly trapped; the rain-water pipe was improperly connected with the house drain. There was no history of any previous case of erysipelas in the house, or amongst the parents' friends. No application had been made to the vaccination places, except dry clean linen rags.

Conclusion. The evidence, therefore, evidently points to the infection having entered the system through the vaccination sores from the foul atmosphere at the house, and not to have been due to introduction in the vaccine virus at the time of vaccination.

ARTHUR PEARSON LUFF, M.D.

CASE 255, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of A. J.: report to the Commission of Dr. Arthur Pearson Luff.

In June 1893 I was requested by the Commission to investigate the circumstances attending the death of A. J. late of ——, and the alleged connexion of the death with vaccination.

The entry in the register of the death of the child was to the effect that A. J., aged twenty-two days, died on the 19th June 1893, the cause of death being certified by Dr. M. B., of ——, as "erysipelas; exhaustion." The registrar of births and deaths at ——, when forwarding a copy of this entry to the Local Government Board informed the Board that the child's mother affirmed that the certifying practitioner informed her that vaccination was the cause of death.

I proceeded to —— on the 30th June 1893 and first interviewed the mother of the deceased child, a domestic servant, aged 18 years, who informed me that the child was an illegitimate one, and was born at the —— Workhouse on Monday, the 29th May. He was vaccinated at the same place by Mr. B., the Union Medical Officer, on the 9th June, and was inspected by him on the 16th June, when the vaccination was going on well; on the following day, the 17th June, the mother informed me that she left the Workhouse of her own accord, and wandered about —— till late at night, during which time she thinks the child took cold, as she had no proper covering for him. She was taken into the house of some people, who, seeing that there was something wrong with the child, the next day sent her with the child to Dr. M. B. She informed me that she had not applied anything to the vaccinated arm previous to taking the child to Dr. M. B., nor had she pricked the vaccination spots nor allowed the sleeve of the child's dress to rub against the arm. When she left the Workhouse on the morning of the 17th June, the arm seemed to be going on very well, and it was not till the following morning, the 18th June, that she noticed that the vaccinated arm was hot and inflamed.

I next interviewed Dr. M. B., who informed me that the deceased was brought to his surgery on the 18th June at 2 p.m.; there were three vaccination sores on the left arm, which were scabbed over and were not discharging. The arm was hot, red, and swollen, and the hand was œdematous. When the arm was touched the child cried; the inflammation and swelling was confined to the vaccinated arm. His diagnosis was erysipelatous inflammation, for which he prescribed lead lotion. The child died the next morning. The child was a puny, ill-nourished one, and in his opinion not likely to have lived for long, even if vaccination had not been performed. He had never made any statement to the effect that vaccination was the cause of death, and certainly had never stated such to the mother. In his opinion the exposure of the child during the whole of the 17th June, on which day it became very cold at night, would account for the disease, which he thinks would probably not have occurred if the child had been kept in the Workhouse.

Mr. B., Medical Officer to the —— Union, informed me that he vaccinated the deceased child from another child, T. S., and at the same time and from the same source vaccinated two other children, viz., H. C. and H. A. He vaccinated the deceased in three places on the left arm on the 9th June, and inspected the arm on the 16th June, when the places looked, for the period, well and healthy, and the vaccination was pursuing a normal course; there was at that time no sign whatever of any erysipelatous inflammation. On the following day the child was taken away from the Workhouse by his mother.

Vaccinifer and co-vaccinees. I saw the vaccinifer, T. S., and the two other children, H. C. and H. A., and found them all to be healthy children in whom the vaccination had taken and proceeded in a normal manner.

Conclusion. The deceased child A. J. evidently had an erysipelatous inflammation of the left arm, from which condition, and exposure to cold weather when in a weak state, the child probably died; the erysipelas was in all probability caught during the exposure of the child on the 17th June.

In my opinion the erysipelas could not have been inoculated with the vaccine virus at the time of vaccination, for the following reasons, viz.:—

(i.) When the child's arm was inspected on the seventh day after vaccination, it was, for the period, in a normal condition, and no erysipelas was present.

(ii.) Erysipelas did not make its appearance until the ninth day after vaccination.

(iii.) The vaccinifer was a healthy child in whom the vaccination had run a normal course and he had not suffered from erysipelas; and

(iv.) Two other children vaccinated at the same time and from the same source as the deceased remained healthy, and the vaccination in each case ran a normal course.

ARTHUR PEARSON LUFF, M.D.

CASE 257, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of C. H. P. : report to the Commission of Dr. Arthur Pearson Luff.

In July 1893 I was requested by the Commission to investigate the circumstances attending the death of C. H. P., late of ——, and the alleged connexion of the death with vaccination.

The entry in the register of the death of the child was to the effect that C. H. P., aged eight months, died on the 27th June 1893, the cause of death being certified by Dr. E. A. O., of ——, as "vaccination, 22 days; erysipelas, 7 "days; inflammation of lungs, 2 days."

I proceeded to —— on the 22nd July 1893, and Dr. E. A. O. informed me that the deceased was vaccinated by him on the 31st May from F. C., of ——, being the only child vaccinated from that source. The child was vaccinated in four places, all of which took. He was inspected by Dr. E. A. O. on the 8th June, and was passed as a case of successful vaccination, and from his arm on that day Dr. E. A. O. vaccinated C. E. O., of ——. Dr. E. A. O. was next sent for to see the deceased on the 18th June, 18 days after vaccination, when the arm looked slightly inflamed, and by the 22nd, *i.e.*, 22 days after vaccination, well-marked erysipelas appeared; pneumonia set in later on, and the child died on the 27th June. The deceased had always been a delicate and weak child and was the subject of cleft-palate.

Mrs. P., the mother of the deceased, informed me that the child had always been a weak one; she had never pricked the vaccination spots with anything, but on the ninth day after vaccination she applied bread poultices and cold-water rags to the arm, as she thought those applications would do good, although at the time it was not looking inflamed. During the week preceding the commencement of the attack of erysipelas there was a very bad smell throughout her house from a leaking man-hole in the yard of the next house, which man-hole was afterwards, on account of the general complaints of the nuisance, sealed down. I found that the man-hole referred to was within ten feet of Mrs. P.'s house, and was attached to a drain which received the soil-pipes from 12 houses. This man-hole had just been securely sealed down; there was general complaint amongst the inmates of the houses, and previous to the sealing down of it the smell emanating therefrom had been very bad.

Vaccinifer. I next visited F. C., the vaccinifer of C. H. P., and found her to be a healthy child in whom the vaccination had pursued a normal course.

Sub-vaccinee. I also visited and saw C. E. O., who was vaccinated from the deceased on the eighth day after vaccination, and found him to be a healthy child, in whom the vaccination had run a normal course.

Conclusion. The child C. H. P. died of inflammation of the lungs occurring as a complication of erysipelas. The cause of the erysipelas was, in my opinion, the septic matter emanating from the leaking drain at the back of the house. It was not in my opinion due to inoculation with impure lymph, for the following reasons, viz. :—

(i.) Erysipelas did not show itself until the 22nd day after vaccination.

(i.) The vaccinifer was a healthy child in whom the vaccination had run a normal course; and

(iii.) A child was vaccinated from the deceased on the eighth day after vaccination, and had throughout a good arm, the vaccination running a normal course.

ARTHUR PEARSON LUFF, M.D.

CASE 258, REPORTED TO THE COMMISSION BY MR. J. H. LYNN.

Case of A. W. : report to the Commission of Dr. Arthur Pearson Luff.

In July 1893 I was requested by the Commission to investigate the circumstances attending the illness of A. W., of ——, and the alleged connexion of the illness with vaccination.

Mr. J. H. Lynn's letter of the 13th July 1893 informing the Commission of the case requested that it might be inquired into at the earliest possible opportunity as the parents both thought that the case would prove fatal, and also stated :—"A. W., of ——, was born on the 4th "February 1893. On Tuesday, 6th June, she was taken "to Dr. C., of ——, to be vaccinated. The vaccination "did not take. On the 13th June he again operated, "remarking, 'If this does not take, nothing will 'take.' "Lymph from a tube was used. The operation was in "one place only. Towards the end of the week following, "the child was 'twitching and on the pine.' On the "eighth day she was inspected, and the papers were duly "signed. About the tenth day the arm became swollen, "hard, and inflamed, and a lump came under the arm. "The vaccine wound ulcerated. The axillary swelling "also ulcerated, and both had grown worse continually. "The child is now very weak, and refuses nourishment. "Hitherto Dr. C. has attended the case. He advises "that the child be taken to a hospital, and thinks it "cannot live. His partner, Dr. M., thinks nothing can "save it but amputation. To-day (July 13th) the mother "will take the child to St. Bartholomew's Hospital, and "request them to receive it as an in-patient. The parents "are healthy, and the other children, as was this one "until it was vaccinated. The parents are distracted, "and the mother's distress it is pitiful to witness. She "assures me that every possible care has been taken, day "and night, and that the blood-poisoning cannot be "attributed to any neglect or unclean conditions."

On the 15th July 1893 I went to St. Bartholomew's Hospital, and there saw the child A. W., who was at the time an in-patient. She was suffering from cellulitis of the upper left arm. In the vaccination area on the left arm there was an ulcerated place about an inch and a quarter long by an inch wide, involving the skin and subcutaneous tissue; the edges of the ulcer were hardened, and the base was composed of clean, granulating tissue. In the left axilla there was an ulcer about one inch in length by three-quarters of an inch in width, which laid bare some muscle-fibres of the axillary muscles; this ulcer was also in a clean, granulating condition. The temperature was normal, and had been so since admission into the hospital; the constitutional condition was good, and the child took food well. I was informed by the House Surgeon in charge of the case that it was not considered in any sense a grave case, and that the question of the amputation of the arm had never been thought of, and that the granulating up and healing of the wounds was probably only a question of a few weeks.

On visiting the mother of the child she informed me that she had taken every care of the child's arm, not allowing friction of the dress against the vaccination spot, and that she did not prick the place with any pin or needle; she did not know of any cases of erysipelas in the vicinity or amongst any of her friends or people visiting her house; both she and her husband were opposed to vaccination, and she had taken her child since her vaccination to be seen by Mr. A., who wrote a letter about her child to the "Echo," which appeared on the 12th July 1893.

Sanitary surroundings. I inspected the sanitary arrangements of Mrs. W.'s house, and found them to be in a good condition. I do not think that the condition of the arm of the child was in any way due to defective sanitation.

I interviewed Dr. C., of ——, the vaccinator of the child, who informed me that the vaccination that failed on the 6th June, and also the one that took, done on the 13th June, were both performed with Dr. Renner's calf lymph. On the eighth day after vaccination he saw the child and passed the case as a good and successful vaccination, the arm not being then at all inflamed, and the vaccination mark looking in a normal condition. On the tenth day after vaccination, when he saw the child, there was a small ring of inflammation around the vaccination mark, the inflammation subsequently extended and was succeeded by ulceration of the vaccination place and also of the axillary glands, and he advised that the case should be taken to a hospital. He did not express the opinion

that the child could not live, nor did his partner, Dr. M. express the opinion that nothing could save it but amputation of the arm. Five other children were vaccinated at the same time as A. W., and from the same tube of calf lymph; all these children were going on well when inspected on the eighth day after vaccination, and he had not since heard from the parents of any of them, nothing unusual having occurred. Although Dr. C. had the names of these five children entered in his books, he had not got their addresses, and as they had only been brought casually to his surgery, he did not know the addresses of any of them.

After some trouble I succeeded in tracing and inspecting four out of these five children, viz. :—

(1.) W. M. H., vaccinated in one place, who is a healthy child, and whose vaccination pursued a normal course.

(2.) M. E. S., vaccinated in one place, also healthy, and whose vaccination pursued a normal course.

(3.) A. E. R., vaccinated in one place, also healthy, and whose vaccination pursued a normal course.

(4.) B. H., vaccinated in one place, also healthy, and whose vaccination pursued a normal course.

The illness of the child A. W. was undoubtedly that of cellulitis of the arm following upon an inflammatory condition secondary to vaccination, and producing enlargement and inflammation of the axillary glands.

I do not think that the cellulitis was due to the employment of impure lymph, for the following reasons :—

(i.) The child when inspected on the eighth day after vaccination was going on well, and the vaccination was passed as good and successful.

(ii.) Of five other children vaccinated at the same time as A. W. and with the same batch of lymph, four have been seen and inspected; they were all healthy and the vaccination was not attended with any complication.

ARTHUR PEARSON LUFF, M.D.

CASE 259, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of D. S.: report to the Commission of Dr. Arthur Pearson Luff.

All my efforts to gain information as to the circumstances connected with the death of D. S., certified to have died on the 12th July 1890 at the age of six months from "vaccinia; phagedæna of axilla, 3 weeks," have been futile owing to both the mother of the deceased and the certifying medical man having left the —— district and not being traceable. The certifying medical man's address is not in the Medical Directory. The deceased was an illegitimate child.

ARTHUR PEARSON LUFF, M.D.

CASE 260, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of J. P. J.: report to the Commission of Dr. Arthur Pearson Luff.

In July 1893 I was requested by the Commission to investigate the circumstances attending the death of J. P. J., late of ——, and the alleged connexion of the death with vaccination.

The entry in the register of the death of the child was to the effect that J. P. J., aged nine months, died on the 15th July 1893, the cause of death being certified by Dr. J. T. S., of ——, as "vaccination; marasmus; convulsions."

I proceeded to —— on the 7th September 1893, and found that the deceased child was vaccinated by Dr. J. T. S., on the 20th March 1893, with calf lymph supplied by Dr. Hime of Bradford. The vaccination was done in one place on the left arm. From the same batch of lymph Dr. J. T. S. vaccinated at the same time two other children: J. M., of ——, and E. M., of ——. The vaccination of the deceased went on quite well for the first week, at the end of which time a brother of the deceased had an attack of measles, and Dr. J. T. S. believes that the deceased also had an abortive attack of the same disease at the same time. At 10 days after the vaccination, the arm began to inflame, and to show signs of ulceration, the axillary glands swelling at the same time. In a few days an ulcer had formed at the vaccination place, and an abscess also formed in the axilla. Bread poultices were applied to the ulcerated arm, and the abscess in the axilla was opened; discharge took place from the arm for some weeks; about two months after the vaccination erysipelas supervened on the affected arm, and subsequently spread across the chest to the other arm. About the same time the child had an attack of bronchitis and gradually wasted; suppuration finally ceased, and the ulcer on the arm, as well as the suppurating place in the axilla, completely healed, healing being complete about 14 days before death occurred. The child, however, continued weak, and the wasting progressed, and finally death occurred from convulsions. The child was never a strong one; he was fed at the mother's breast for three months, but after that was brought up on Nestlé's milk.

Sanitary surroundings. The source of infection of the erysipelas I was unable to trace, there having been no known case at the time of the attack in the neighbourhood, nor amongst the friends or acquaintances of the parents. The sanitary arrangements of the house where the parents of the child live I found to be very good; the closet was situated in the rear of the house, and was emptied every other day, and was in a good sanitary condition.

Co-vaccinees. I inspected the two other children vaccinated from the same batch of calf lymph as the deceased, and found that they had both been vaccinated in one place on the left arm. In both of them the vaccination had pursued a perfectly normal course, and no complications whatever had arisen.

Conclusion. The deceased child evidently died of the wasting resulting from the long continued suppuration that occurred from the ulcerated vaccination place, and from the abscess in the axilla. The erysipelas that supervened was not, in my opinion, due to inoculation with impure lymph, for the following reasons :—

(i.) Erysipelas did not supervene until two months after the abscess had formed.

(ii.) The two other children vaccinated from the same batch of lymph as the deceased did not suffer from erysipelas, and in both of them the vaccination pursued a normal course.

Dr. J. T. S. informed me that he had several times seen rather deep ulceration following the use of calf lymph, but that he had never before met with a fatal result from its use.

ARTHUR PEARSON LUFF, M.D.

CASE 261, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of H. H.: report to the Commission of Dr. Arthur Pearson Luff.

In July 1893 I was requested by the Commission to investigate the circumstances attending the death of H. H., late of ——, and the alleged connexion of the death with vaccination.

The entry in the register of the death of the child was to the effect that H. H., aged one month, died on the 16th July 1893, the cause of death being certified by Dr. E. S., of ——, as "post-vaccinal cellulitis."

I proceeded to —— on the 13th October 1893, the case having previously given me a great deal of trouble, as I had been unable to discover for some time where the child had been vaccinated, owing, as I discovered later, to his having been vaccinated under the maiden name of his mother; whereas, owing to the mother's subsequent marriage, his death was certified under another name. After many inquiries, extending over a period of seven weeks, I discovered that the child was vaccinated when 10 days old, on the 23rd June 1893, in the —— Workhouse by Mr. S., the Medical Officer of the Workhouse, and that the child left the Workhouse on the 1st July well, the arm being at that time in a healthy and normal condition. I found that the deceased had been vaccinated from the arm of a child at that time in the —— Workhouse, named E. O., from

whom the following children were vaccinated at the same time, namely:—(1) R. R. D., (2) A. O., (3) B. W. B., (4) M. J. L., (5) J. J. C., (6) E. H., (7) M. C., (8) A. C., and (9) W. C.

Vaccinifer and co-vaccinees.

All these children were at the time inmates of the Workhouse. Of these, after a great deal of trouble, I was able to trace and inspect the vaccinifer, and three of the co-vaccinees, viz., R. R. D., A. O., and B. W. B. The three C. children (Nos. 7–9 in the above list) could not be traced owing to their parents having left —— with them, and no address being obtainable. Two of the children, namely, E. H. and J. J. C., had since died. E. H. died on the 8th August at —— Hospital from marasmus and pulmonary congestion; J. J. C. died on the 24th July from infantile cholera and convulsions; but from inquiries that I made the deaths of these two children were not attributed to the vaccination, which, from all accounts, was pursuing its normal course in them. I inspected the vaccinifer E. O., a boy 10 years of age, who had been vaccinated a second time, and found him to be a healthy boy with good vaccination marks, in whom the vaccination had run a normal course. The three other children vaccinated from the same vaccinifer at the same time as the deceased child H. H., were inspected by me, and I found them all to be healthy children in each of whom the vaccination had proceeded well and had run a normal course.

Sanitary surroundings.

The mother of the deceased child could not be traced, but the house to which she had taken the child after removing him from the Workhouse was in a low quarter of ——, and was in a very dirty and unsanitary condition, a pan or pail closet, situated at the rear of the house, being in a very dirty state. Dr. E. S., who certified the death of the child, informed me that, in his opinion, he believed that dirt and general neglect were the chief causes in setting up cellulitis in and around the vaccination sores, and that as a result of the cellulitis the child died.

Conclusion.

From the facts and information that I have been able to obtain in connexion with this case, I am of opinion that the deceased child died from cellulitis produced in the vaccination wounds as a result of the dirty condition in which he was kept, and the unsanitary surroundings in which he lived. In my opinion the cellulitis was not due to inoculation with impure vaccine lymph, for the following reasons:—

(i.) The child when inspected on the eighth day after vaccination was in a healthy condition, and the vaccination marks looked, for the period of vaccination, normal.

(ii.) The vaccinifer was a healthy boy in whom the vaccination had run a normal course.

(iii.) Of the three other children vaccinated at the same time and from the same source as deceased that I was able to see, the vaccination in each of them had run a normal course, and all three of the children had remained healthy.

ARTHUR PEARSON LUFF, M.D.

CASE 262, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of E. L. G.: report to the Commission of Dr. Arthur Pearson Luff.

In July 1893 I was requested by the Commission to investigate the circumstances attending the death of E. L. G., late of ——, and the alleged connexion of the death with vaccination.

The entry in the register of the death of the child was to the effect that E. L. G., aged three months, died on the 24th July 1893, the cause of death being certified by Dr. W. P. F., of ——, as "vaccination; convulsions; diarrhœa; "exhaustion."

I found on inquiry that the deceased child was born on the 6th April 1893, one of twins, the other having died soon after birth. The child was brought up from the first on Nestlé's milk. She was vaccinated on the 4th July 1893, by Dr. R. C. at —— from calf No. —, the vaccination being done in five places. Two days after the vaccination sickness and diarrhœa set in. On the eighth day the child was taken to be inspected, when the arm was somewhat inflamed. On the 10th day after vaccination convulsions set in, and the child was then seen by Dr. W. P. F., who found the arm was red, hard, and painful from the shoulder to the elbow. Diarrhœa and sickness continued until the death on the 24th July, the child dying in convulsions. Nothing had been applied to the vaccination places.

Sanitary surroundings.

The sanitary condition of the house where the parents of the child live was good.

The following seven children were vaccinated at the same time as the deceased with lymph from the same calf, viz.:—G. H., of ——, E. N., of ——, G. L., of ——, T. E. W., of ——, G. J. B., of ——, R. T., of ——, and A. H., of ——.

Co-vaccinees.

All these children have been traced and seen with the exception of E. N. The vaccination of G. H. ran a perfectly normal course. The vaccination of T. E. W. ran a perfectly normal course. The vaccination of G. J. B. ran a perfectly normal course. The vaccination of R. T. was at first attended with considerable inflammation from which the child at the time of inspection had completely recovered; the arm looked normal. The vaccination of G. L. was at first attended with considerable inflammation; at the time of inspection the scabs were drying up well. The vaccination of A. H. was at first attended with considerable inflammation; at the time of inspection the arm looked quite well.

Conclusion.

The death of the deceased was in my opinion due to infantile diarrhœa, which was probably due rather to improper diet than to vaccination, although it is possible that the inflammation resulting from vaccination may have been a factor in the production of the diarrhœa and the exhaustion from which the child died. The lymph employed in this case appears to have produced considerable local inflammation in three other children than the deceased, but the vaccination was ultimately successful in the cases of all the other children that I was able to inspect, and that were vaccinated at the same time as the deceased.

ARTHUR PEARSON LUFF, M.D.

(B.) CASES BROUGHT TO THE COMMISSION'S NOTICE DURING THE PERIOD FROM THE 1ST AUGUST 1893 TO THE 31ST JULY 1895.

CASE 267, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of W. J. S.: report to the Commission of Dr. Arthur Pearson Luff.

In September 1893 I was requested by the Commission to investigate the circumstances attending the death of W. J. S., late of——, and the alleged connexion of the death with vaccination.

The entry in the register of the death of the child was to the effect that W. J. S., aged four months, died on the 31st August 1893, the cause of death being certified by Mr. W. A. M., M.R.C.S., of ——, as "axillary abscess "after vaccination; stomatitis; diarrhœa."

On making inquiry I found that the vaccination was performed by Dr. P., of ——, at the vaccination station in ——. The deceased was vaccinated from another child, and at the same time two other children were vaccinated

from the same vaccinifer. The vaccination was performed on the 11th July, when the child was three months old, four places on the left arm being inoculated; of these three took.

Mrs. S., the mother of the deceased child, informed me that the places did not heal, and that from four to five weeks after the vaccination inflammation commenced around the three places. She had all this time been washing the places with yellow soap and water four or five times a day; but apart from this application she had not used anything else to treat or dress the vaccination sores with. The child from the time of his vaccination was brought up on Ridge's Food and Nestlé's milk, and suffered from symptoms of gastro-intestinal catarrh most of the time. Fourteen days previous to death sickness and diarrhœa commenced and continued until death occurred. The child at the same time suffered from thrush and inflamed mouth and gums.

The sanitary arrangements of the house in which the deceased child lived were good.

Mr. W. A. M., the medical man who certified the death, informed me that when the child was brought to him it was suffering from inflamed mouth and axillary abscess, and the diarrhœa set in and continued until death occurred. He opened the axillary abscess, after which the child appeared to do well, and he did not expect a bad result. In his opinion the immediate cause of death was exhaustion from diarrhœa, and he thought that the abscess in the axilla might have been induced by some irritating substance coming in contact with the vaccination sores during the healing process.

I next saw the vaccinifer of the deceased child, namely, F. S., of ——. She was a healthy child in whom the vaccination had run a normal and successful course.

I also saw and visited two other children, vaccinated from this vaccinifer at the same time as the deceased, namely, D. F., of ——, and H. R., of ——. I found that they were both healthy children, in both of whom the vaccination had run a normal and successful course.

In my opinion the death of the child W. J. S., was mainly due to the exhaustion consequent upon the sickness and diarrhœa that he suffered from, which sickness and diarrhœa were probably due to the improper food (Ridge's and Nestlé's) that he was fed on when under three months of age. The inflammation of the vaccination sores, and the formation of the axillary abscess secondary to that inflammation, were probably due to the repeated washings with common yellow soap to which the vaccinated arm and sores were subjected. In my opinion the condition of the child's arm and general health were not due to inoculation with improper vaccine lymph for the following reasons:—

(i.) The vaccination sores did not become inflamed until about thirty days after vaccination, and then only after they had been repeatedly washed with common yellow soap and water.

(ii.) The vaccinifer was a healthy child in whom the vaccination ran a normal and successful course; and

(iii.) The two other children vaccinated from the same vaccinifer and at the same time as the deceased, had successful vaccinations and remained in perfect health.

ARTHUR PEARSON LUFF, M.D.

CASE 268, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of G. S.: report to the Commission of Dr. Arthur Pearson Luff.

In September 1893 I was requested by the Commission to investigate the circumstances attending the death of G. S., late of ——, and the alleged connexion of the death with vaccination.

The entry in the register of the death of the child was to the effect that G. S., aged five months, died on the 31st August 1893, the cause of death being certified by Mr. V. S. S., of ——, as "erysipelas after vaccination with "diarrhœa and convulsions."

I proceeded to —— on the 12th October 1893. The child had been vaccinated by Mr. C. F. K., Public Vaccinator, of ——, who informed me that he vaccinated him on the 27th July 1893 from the arm of another child at the public vaccination station at ——. The vaccination was done in four places, three of which took, and when inspected seven days later the arm was in a good condition and the vaccination was recorded as a satisfactory one. About 18 or twenty days after the vaccination, the mother of the child brought the deceased to him. Both the mother and the child were at the time in a deplorable state of dirt and wretchedness; the vaccination sores being covered with a piece of dirty flannel which was saturated with pus, and pus was freely discharging from the vaccination wounds. He gave her some lotion to apply to the sores and lint to put it on with, but after that occasion he did not see her again.

Mr. V. S. S., the medical man who certified the death, informed me that in his opinion the source of the erysipelas was from dirt and neglect, the child being at the time that he saw him in a filthy condition, and the arm covered with a dirty rag. He did not think at the time that he first saw the child, a week previous to death, that he would die from the erysipelas alone, but the death was accelerated by the diarrhœa and convulsions that supervened.

Mrs. S., the mother of the deceased child, informed me through an interpreter (she being a Polish Jewess and unable to speak English), that the arm remained well and usual in appearance until from three to four weeks after vaccination, and that about the end of the fourth week the redness and swelling of the arm appeared. She did not at any time prick the vaccination sores nor apply anything to them except a piece of flannel, which was changed at rare intervals, and allowed to become very dirty. Neither to her knowledge nor to that of the doctors were there any cases of erysipelas in the immediate vicinity.

Sanitary surroundings. The house in which Mrs. S. lived was in a very dirty and unsanitary condition, a pan closet being situated a few feet from the house in the rear, which was at the time in a very dirty condition.

Vaccinifer and co-vaccinees. The child G. S. was vaccinated from the arm of another child named H. S., of ——. At the same time two other children, besides the deceased, were vaccinated from H. S., namely, Y. C., of ——, and A. C., of ——. I inspected the vaccinifer H. S. and found that he was a healthy child with three good vaccination marks, and that the vaccination had run a normal course. Of the two other children vaccinated from this vaccinifer at the same time as the deceased one, Y. C., I was unable to see owing to the removal of the parents and their having left no address; but the other child A. C. I inspected and found him to be a healthy child with two good vaccination marks, in whom the vaccination had run a normal course.

Sub-vaccinee. From the deceased child G. S. Mr. C. F. K. vaccinated on the 3rd August one child, namely, B. G., of ——. I inspected this child and found him to be a healthy child with two good vaccination marks, in whom the vaccination had run a normal course; and at no time since his vaccination had the child been ill, nor had there been any inflammation around the vaccination marks.

Conclusion. The deceased child G. S., in my opinion, died from the effects of the erysipelas and the sequelæ of the erysipelas, viz.:—diarrhœa and convulsions. The infection with erysipelas was in my opinion due to the dirty condition in which the child was kept and the unsanitary surroundings in which he lived. The poison was probably introduced into the system through the vaccination wound somewhere about the fourth week after vaccination, on account of the sores remaining open owing to the dirt and other irritant matters coming into contact with them. In my opinion the poison of the erysipelas was not introduced with the vaccine lymph at the time of vaccination for the following reasons:—

(i.) The vaccinifer was a healthy child in whom the vaccination ran a normal course, and he remained healthy afterwards.

(ii.) Another child vaccinated from the same vaccinifer at the same time as the deceased remained healthy and his vaccination ran a normal course.

(iii.) A child vaccinated from the arm of the deceased on the eighth day after his vaccination remained perfectly healthy and his vaccination ran a normal course; and

(iv.) The erysipelas did not appear until four weeks after the time of vaccination.

ARTHUR PEARSON LUFF, M.D.

Case 271, reported to the Commission by the Local Government Board.

Case of J. H. T.: report to the Commission of Dr. Arthur Pearson Luff.

In September 1893 I was requested by the Commission to investigate the circumstances attending the death of J. H. T., late of ——, and the alleged connexion of the death with vaccination.

The entry in the register of the death of the child was to the effect that J. H. T., aged two months, died on the 7th September 1893, the cause of death being certified by Dr. G. B., of ——, as "general cutaneous erysipelas, 18 "days (vaccinated 28 days ago, places now healed)."

I proceeded to —— on the 22nd September 1893, and I first visited the mother of the deceased child, who informed me that the child was vaccinated on the 10th August 1893 from the arm of another child. The vaccination went on well for the first twelve days, at the end of which period she first noticed some redness around the vaccination spots, and at the same time the child suffered from sickness, but did not have any diarrhœa. The child had no convulsions until the day before his death. The inflammation had spread from around the vaccination marks down to the hand of the same arm, then across the chest and back to the other arm, and finally to both legs. There were no cases of erysipelas known in the vicinity, nor amongst any of the friends of the mother of the deceased child. She had not pricked the vaccination marks, nor had she allowed the dress to rub against them, but she had freely applied bread poultices to the arm at the time that the child was taken with the erysipelas. There had been bad smells emanating from the privy situated a few feet (about 10 feet) in the rear of the cottage, the weather being very hot at that time. I found this privy emptied into a cesspool, which was in a very foul and stinking condition, and which was only emptied three times a year, and which had not been emptied for nearly four months.

The certifying medical man, Dr. G. B., who attended the deceased during the illness that preceded his death, informed me that it was an undoubted case of general cutaneous erysipelas, and that death took place from convulsions caused by the disease. He did not know of any case of erysipelas in the vicinity and was inclined to attribute the infection to the fetid cesspool at the rear of the cottage.

Vaccinifer. The vaccinating medical man, Dr. E., of ——, informed me that the deceased child was vaccinated by him on the 10th August 1893, in four places, from K. E. H. I saw and inspected this child and found she had been vaccinated in four places, and the vaccination was a thoroughly successful one and had run a normal course.

Co-vaccinees. From this vaccinifer three other children, in addition to the deceased, had been vaccinated. All of these I saw and inspected, namely:—

B. M. J., who had been vaccinated in four places, all of which took. The vaccination had been a thoroughly successful one and had run a normal course.

B. A. M., who had been vaccinated in four places, all of which took. The vaccination was a thoroughly successful one and had run a normal course.

J. H. R., who had been vaccinated in four places, one of which had taken well. The vaccination had run a normal course.

Sub-vaccinee. In addition I found that from the deceased child J. H. T. there had been vaccinated, on the eighth day after his vaccination, another child, namely, F. M. W. I inspected this child and found she had been vaccinated in four places, all of which had taken well, and the vaccination had run a successful and normal course.

Conclusion. The child, J. H. T., certainly died from general cutaneous erysipelas which in my opinion was probably due to infection through the vaccination wounds from the foul emanations arising from the open cess-pool in the rear of the cottage during the hot weather that prevailed at that time. The erysipelas, in my opinion, was not due to inoculation with impure vaccine lymph for the following reasons:—

(i.) The erysipelas did not appear until the twelfth day after vaccination.

(ii.) The vaccinifer was a healthy child in whom the vaccination ran a normal course.

(iii.) The three other children vaccinated from the same vaccinifer as the deceased remained healthy, and in each of them the vaccination ran a normal course; and

(iv.) The child, F. M. W., vaccinated from the deceased on the eighth day after his vaccination remained healthy, and her vaccination ran a normal course.

Arthur Pearson Luff, M.D.

Case 309, reported to the Commission by the Local Government Board.

Case of W. T.: Report to the Commission by Dr. Theodore Dyke Acland.

W. T., born on the 24th March 1893, and admitted to the —— Workhouse on the 15th May 1893, was vaccinated on the 10th June 1893. *(See note below.)* *Vaccination.*

22nd November 1893. *Death.*

"Constitutional syphilis; exhaustion." *Certified cause.*

Mr. C. W. I., M.R.C.S., Medical Officer of the —— Workhouse. *Certified by.*

Believed to be from calf No. ——, stored on points and sent from the National Vaccine Establishment to Mr. C. W. I., on the 24th May 1893. *Source of lymph.*

[*Note.*—Some doubt has arisen as to the actual source of lymph and as to who was the vaccinator, owing to the fact that in the first report of the case made to the Local Government Board by the Clerk of the —— Guardians, it was stated that the vaccination was performed by Mr. C. W. I. with calf lymph on the 24th May 1893. The date given is, as far as I can ascertain, an error, for the entry in the Workhouse vaccination register states that vaccination was done by Mr. C. W. I. on the 10th June. No return of the success of vaccinations done with the National Vaccine Establishment lymph on the 10th June was made to the Local Government Board by Mr. C. W. I. Mr. T. A. B. S., his partner, reported successful cases vaccinated on the 25th May, the 1st June, the 20th June, and the 21st June. The matter is further complicated by the fact that Mr. T. A. B. S., and not Mr. C. W. I., signed the certificate of the successful vaccination of the child W. T. This certificate is dated the 11th June 1893. I have been unable to arrive at any certain conclusion as to the source of lymph. Mr. C. W. I. states in answer to my inquiries that he, and not Mr. T. A. B. S., did vaccinate the child W. T., but that he may have used lymph stored in tubes and taken by Mr. T. A. B. S. from some case vaccinated on the 1st or 2nd June.]

According to the register, six; there numbered 295–300. *Co-vaccinees.*

(i.) M. E. B. G., No. 295 in the register. Has left the Workhouse, but the nurse who had charge of her informs me that vaccination was without complication, and that the arm was well before she left the institution.

(ii.) L. H., No. 296 in the register. Vaccination normal; no complication of any kind. There are now (6th February 1894) two normal scars. The child seems well and physical examination shows no evidence of syphilis.

(iii.) E. E., No. 297 in the register. The mother took the child out of the Workhouse a week after vaccination. One of the vesicles was rubbed. To protect the place a shield was used which, according to the mother, was constantly irritating the wound. The child was brought back to the Workhouse for treatment, and when seen by the nurse was found to be in a very dirty state with the pus-soaked shield rubbing right into the wound. With simple attention to cleanliness the arm was well in a week. There is now (6th February 1894) one long puckered scar giving evidence of considerable past inflammation and loss of tissue. Physical examination shows no evidence of syphilis.

(iv.) S. W. M., No. 298 in the register. Vaccination normal. There are now (6th February 1894) two normal scars. Nutrition good; there is some nasal

catarrh; a sore on outer side of right nostril, and one or two minute patches of dermatitis on face; mucous membrane of mouth normal; no mucous tubercles round mouth or anus; corneæ clear; bones healthy. No evidence of inoculated or congenital syphilis.

(v.) J. W., No. 299 in the register. Vaccination normal. There are now (6th February 1894) two healthy scars. No evidence of syphilis.

(vi.) E. T., No. 300 in the register, a half-sister of W. T., the subject of this report. Vaccination said to have been normal. There are now (6th February 1894) two scars showing signs of some excess of inflammation; they are elongated and not foveated. Complexion clear; nutrition good; cornea clear; glands not enlarged; bones, no evidence of periosteal thickening; no mucous tubercles round mouth or anus. No evidence of congenital or invaccinated syphilis.

None; the vesicles were not opened on the eighth day.

Mr. C. W. I., the vaccinator, Mrs. D., the head nurse, Nurses W. and R., and J. D. and Mrs. Q., inmates of the Workhouse, who had at various times charge of the child W. T., agree in saying that as far as they know the vaccination of the child was without complication of any kind. There was no excess of inflammation, no discharge from the vesicles, no enlargement of axillary glands, no general or local eruption of any kind. The scabs formed naturally, dried up, and fell off without the wounds re-opening. I have not been able to elicit any information which tends to show that vaccination was otherwise than normal.

During the period immediately succeeding vaccination the child was under the care of J. D. (an inmate of the Workhouse, not trained and illiterate). She noticed nothing wrong with the child until the beginning of August, two months after vaccination; a "blind-boil" then formed at the back of the left thigh, in consequence of which the infant was transferred from the Nursery to the Convalescent Ward, where Mrs. Q. had general charge of him under the superintendence of Nurse R., who saw to the sick nursing. She says that the "boils" commenced as dusky papules, enlarging and breaking down when poulticed; she believes that they lasted between two and three months, coming out in crops. Altogether there were twenty-six of them. Nurse R. states that when the child first came under her care she suspected that he was suffering from congenital syphilis. He had well marked snuffles, and although at first his nutrition was good he gradually wasted and got to look withered and old. Mrs. Q. states that while she had charge of the child he had much dusky red rash about the nates and scrotum and her statement is confirmed by Nurse W. who saw the child three to four times a week when she made the visit to the Wards with Mr. C. W. I. Nurse W. also confirms Nurse R.'s statement that the child began to waste soon after his removal to the Convalescent Ward, *i.e.*, about the middle or end of August, five months after birth and two-and-a-half after vaccination. She says that the snuffles, the appearance of the rash on the nates, and the withered aspect of the child left no doubt in her mind that the case was one of congenital syphilis. Nurse W. has been employed in the Infirmary for ten years, and has seen many cases of infantile syphilis. Some weeks, probably seven or eight, before death, the child began to suffer from an eruption on his head with a profuse discharge forming thick crusts. It was believed by Mr. C. W. I. to be impetigo, and as far as he was able to judge to be in no way connected with the preceding vaccination.

For the last three or four months of his life the child continued to waste in spite of treatment. Mr. C. W. I. informs me that the snuffles became gradually worse, that the child had a hard, dry cough, that his cry became harsh and squeaking, and that he found some ulceration of the mucous membrane of the mouth and denudation of the epithelium of the tongue over an area the size of sixpence. He had no doubt in his mind when he signed the certificate that death resulted from constitutional syphilis, and he formed this opinion entirely from the symptoms which developed while under observation in the Union. He was not at the time aware of the mother's history, and he believed at the date of the child's death that both father and mother were already dead.

Some time about September Mrs. Q., the pauper inmate who looked after the child, inoculated her face with some of the pus from one of the "boils." She seems to have suffered in consequence from an abscess and lymphangitis of the left arm. The glands in the left axilla were painful and broke down; she was ill five weeks, but does not appear to have suffered from any symptom of inoculated syphilis. This would seem to show that whatever the nature of the "boils" they were in all probability not a secondary phenomenon of syphilis inoculated at the time of vaccination.

Treatment of vesicles. None was required. The vesicles were not opened on the eighth day.

Method of vaccination. Mr. C. W. I. says that he is very particular as to cleanliness, that he invariably wipes his lancet between the vaccinations, and that he hardly ever vaccinates directly arm to arm in the Union and never unless he knows the parentage of the child from whom the lymph is taken. It does not seem certain that on the day on which the child W. T. was vaccinated all the children were vaccinated with calf lymph from the National Vaccine Establishment. The child vaccinated immediately before W. T. was E. T., his half-sister.

Previous history. The child W. T. was admitted into the Union on the 15th May 1893, the day after his mother's death. He was then believed to be in reasonably good health. The entry in the medical relief book "debility" merely means that it was necessary to draw extra milk and sugar for him as he was hand-fed. What his chances of being well looked after previous to admission to the Union may be judged from the fact that his mother was destitute, ill, and deserted by the man she lived with before the child's birth. She died about six weeks after her confinement.

Family history. The family history is very bad. There seems no doubt as to the correctness of the following statement.

Mrs. T., the mother of the child W. T., is known to have had seven children, the offspring probably of four fathers, only one of whom was her husband. These children were born in the following order :—

(i.) M. A. H., an illegitimate child.

(ii.) G. T.
(iii.) W——m T.
(iv.) K. T.
(v.) E——a T.
} Children of Mrs. T.'s husband.

(vi.) E. T., parentage uncertain; born two years after the death of Mrs. T.'s husband.

(vii.) W. T., an illegitimate child by W. H. H.

The three eldest children I have not been able to see. The youngest is the subject of this report.

(i.) I am informed by the lady who did it that M. A. H. was removed from the evil associations of her home to an Institution on the 22nd September 1891. It was soon found necessary to transfer her first to the local Infirmary, where she was treated for gonorrhœa, and afterwards to the London Lock Hospital, Harrow Road; she was there from the 29th April 1892 to the 28th July 1892 under treatment for vaginitis. She then entered the Home and remained until May 1893, but was unfit for service till January 1894.

(iv.) K. T., now (February 1894) aged 14; stoutly built but unhealthy looking. Marked scarring at the angles of the mouth; *nose*, broad at base; no history of snuffles; *teeth*, irregular, not characteristically syphilitic; *cornea*, clear; no sign of old iritis; *long bones*, natural, not tender, no nodes or periosteal thickening; no mucous tubercles or scarring of palate or pharynx. An unhealthy, strumous-looking girl with no *unmistakable* sign of inherited syphilis.

(v.) E——a T., now (February 1894) aged 9; a typically strumous-looking child. She has granular lids and corneal ulcers. The left eye has been totally destroyed, probably by suppuration. Teeth not characteristic of syphilis. No evidence of inherited syphilis found in the condition of bones or mucous membranes.

(vi.) E. T., now aged about two years. Born in April 1892, Mrs. T.'s husband having died on the 25th March 1890. For details as to this child see above, under "*Co-vaccinees.*"

(vii.) W. T., the subject of this report.

From the above statement it will be understood that it has been impossible to trace with certainty all the ramifications of Mrs. T.'s family. She herself bore the worst possible character, and is accused by the father of her child W. T. of having communicated disease to him. She seems to have lived in open vice and died in misery, of consumption on the 14th May 1893. The doctor who attended her at the last saw her only 10 days before her death. She was then dying of lung disease and he had no occasion to examine her for syphilis. The man W. H. H., the father of her child W. T., states that she was always under treatment for something or other, but I have not been able to ascertain who attended her.

W. H. H., aged 28, of ——, stated that to the best of his belief he was the father of the child W. T., that he began living with Mrs. T., the mother, about 10 months before the child was born, and that he does not believe it possible that he was also the father of the child E. T.; for though he cohabited with Mrs. T. on various occasions he did not do so until after the child E. T. was born, some six or eight weeks before he actually went to live with her mother. About seven days after this latter date he noticed a sore on his penis, which he believes he contracted from Mrs. T., and he accused her of having given it to him. He stated that previous to this he had never suffered from any venereal disease, though he had run the risk of contracting it, and that although he was aware that he was suffering from a sore and though he professed to believe that he had contracted it from Mrs. T., he continued to have intercourse with her. The sore was not painful, and did not spread. There was very little discharge from it. It was not followed by suppurating buboes. W. H. H. put himself under the care of a chemist, but I have not been able to ascertain the nature of the treatment, as the prescriptions have not been kept. The sore is said not to have been followed by a cutaneous eruption or sore throat. After an interval of some months, but the length of which I was unable accurately to ascertain, a sore formed on the left lower leg which has continued open, slowly spreading ever since. There is now (February 1894) a deep, sloughing punched-out ulcer 1¼ by 1 inch, with thickened edges and foul unhealthy base, with a most offensive discharge. It is nearly circular and is surrounded by a large extent of firm, indurated tissue, dusky red, pigmented, and painful. There is just on the level with the sore a distinct tender thickening of the periosteum; owing to the induration of the soft parts it was difficult to define its limits accurately. W. H. H. says that he had a severe kick on the same shin, but apparently lower down than the place indicated. The veins of the leg are varicose, so that although the appearance of the ulcer is compatible with its being syphilitic, its character is probably altered by the venous congestion of the affected parts. The femoral glands are much enlarged and a little tender. There are large indurated glands in both groins, both axillæ, and both sides of the neck. On the dorsum of the penis there is a well-defined scar in the situation, as the man states, of the primary sore. There is no general eruption on the body and no scarring or pigmentation beyond that on the left leg. *Corneæ*, clear; *iris*, freely movable; no evidence of old iritis; *retinæ*, *choroid* and *optic nerve* on both sides, normal; *fauces*, much congested; on the right side just behind the soft palate a mass of muco-purulent secretion partially covering what appears to be a scar in the mucous membrane. *General condition*—nutrition, poor; appearance unhealthy.

W. H. H., the father of the child W. T., suffered from a venereal disease which there is good ground for supposing to have been syphilis. If his statements are true, he may have contracted the disease from Mrs. T., the child's mother, and even if they are not he could hardly have avoided communicating disease to her.

General surroundings. Before admission to the Workhouse, squalid, vicious, and miserable. After admission, reasonably good. The child was of necessity hand-fed and under the conditions of a nurseling.

Conclusion. The antecedents of the child W. T. are well nigh as pitiable as anything could be. Both his mother and her lawful husband died of consumption, and both his mother and father appear to have led vicious, immoral lives. The evidence in support of Mr. C. W. I.'s supposition that the child died of congenital syphilis is overwhelming, and as far as I am able to ascertain the facts, there is no evidence to show that the vaccination pursued other than a normal course without complication, and there seems to be no ground for supposing that vaccination either caused or accelerated the child's death.

THEODORE DYKE ACLAND, M.D.

CASE 312, REPORTED TO THE COMMISSION BY THE CORONER.

Case of D.L.: report to the Commission of Dr. Arthur Pearson Luff.

On the 12th January 1894, at the request of the Commission, I proceeded to —— and attended the Coroner's inquest touching the death of D. L., aged six months, who died on the 7th January. A communication had previously been received by the Commission from the Coroner stating: "I have to day appointed an inquest for 2 p.m. on Friday "next (the 12th instant), at ——, on the body of a child "named D. L., aged six months, and the daughter of "W. H. L., a bill-poster. The deceased is said to have "died from an abscess or abscesses following improper "vaccination by an unqualified man named W. W. A. "who appears to be practising on his own account at ——. "The deceased was vaccinated by him on 6th November "last (prior to which time she is said to have been a "healthy child); and it is also alleged that a Dr. M., a "qualified practitioner here, gave the usual certificate that "the deceased had been properly vaccinated by him (M.), "although he has never seen the child. Since the 6th "ulto. the deceased has been attended by Dr. J. J. (a "properly qualified man), but death took place yesterday, "the child being at the time, it is said, in great agony."

On arriving at —— I first inspected the body of the deceased child, D. L. It was that of a female child, aged six months, in a decidedly emaciated condition, and on the right arm was one vaccination mark not quite healed, about ⅛ inch in diameter, very slightly undermined at the edge, and with no signs of inflammation or suppuration in the neighbouring tissues. In the right axilla there were the marks of a recent abscess, but as a post-mortem examination had been made on the body these indications had been somewhat interfered with.

I next attended the inquest. The first evidence taken was that of H. L., the mother of the deceased. She stated that her daughter took the deceased child to be vaccinated on the 6th November 1893 by Mr. W. W. A., whom she stated that she knew only under the name of "Dr. H." After the vaccination the deceased seemed cross and the arm did not heal as the mother expected it would. One month after vaccination she called in Dr. J. J., and he at first thought that the illness was due to teething, but a few days later an abscess broke out under the arm. She had had eleven children; the previous ten children had been vaccinated by the Parish Doctor and they all did well. She had sent this one to a private doctor to avoid its being vaccinated in four places. When Dr. J. J. was called in she understood him to say that the illness was caused through vaccination. In answer to questions put by me she stated that Mr. W. W. A., the vaccinator of the child, did not see it until fourteen days after vaccination. Inflammation began around the vaccination spot three days after vaccination, and seven days later extended to about an inch all round the spot. The scab remained on for four or five weeks and when it came away a hole was left which did not heal. The vaccination place and the sore eventually formed were treated with dry rag which was changed once or twice daily, but she did not change the rag as a rule until it had been saturated and become stiff with dirty pus. The child was entirely breast fed and did not suffer from vomiting, diarrhœa, or convulsions.

Mr. W. W. D., surgeon, deposed that he made a post-mortem examination on the body of the deceased on the 11th January 1894. He found one vaccination mark on the right arm which was not quite healed. In the right axilla was a small opening or sinus leading to an abscess. The left side of the chest was full of pus and the left lungs collapsed. The base of the right lung was congested. There was fluid on the surface of the brain. The other organs were fairly healthy. The cause of death in his opinion was empyema and pyæmia, arising from the abscess under the arm, which abscess was caused by vaccination that had gone on wrongly. He could not say whether it was due to bad quality of the lymph, but in his opinion such a condition of affairs as was found in the deceased might arise from a vaccination properly done by himself with pure lymph. In answer to questions put by me the witness stated that the edges of the vaccination wound were undermined about ¼ inch, but that there was no inflammation around the wound. The axillary glands had been destroyed by suppuration, the abscess cavity had contracted and the sinuses of it burrowed in different directions. The amount of pus present in the left side of the chest (left pleural cavity) was about ten to fifteen ounces, but there were no indications of

tubercle or of meningitis on the surface of the brain. There were no abscesses in the lungs, liver, or spleen.

Mr. J. J., surgeon, deposed that he first attended the deceased, on the 6th December 1893, and the child died on the 7th January 1894. When first called in he found the child had a temperature of 104°, and he thought that it had either a commencing specific fever, or that the illness was due to teething. It was not until the following day that his attention was called to the right arm, when he found a scab on the arm which he removed, and underneath it was an unhealthy sloughing wound. The right arm was inflamed down to the elbow, and the inflammation extended over the shoulder and slightly on to the chest. In the right arm-pit was a large abscess. He ordered linseed poultices and lotion to be applied. The abscess burst next day. He told the mother that the illness was caused by the abscess. The abscess did not heal.

Mr. W. W. A., of ——, deposed that he was assistant to Dr. M., of ——, and that he was not himself a qualified practitioner. He vaccinated the child on the 6th November in two places, and on the 20th November he saw it with Dr. M.; only one place had taken and the child seemed to be going on well. Dr. M. gave the certificate to the effect that the vaccination had been done successfully by him (M.). He vaccinated two other children at the same time as deceased. In answer to questions put by me, he stated that the deceased was vaccinated from a tube of calf lymph which he had obtained from Mr. N., pharmaceutical chemist, of ——, and that from the same tube he vaccinated two other children, one named M., of ——, and another named S., of ——.

dict of oner's y.

The verdict was to the effect that death occurred from pyæmia, arising from an abscess after vaccination.

itary round-

I next visited the house in which the deceased child, D. L., had lived. It was a small house in a fairly clean condition, and with the privy at the back, a few feet from the house connected with an ashpit. I was informed that the pit was emptied at very irregular intervals, and that at times it might be left for weeks without being emptied.

rce of ph.

I ascertained from Mr. N. that the calf lymph supplied by him to Mr. W. W. A. was Dr. Renner's lymph.

nac- ces.

I next visited and inspected the two children, M. and S., who had been vaccinated from the same tube of lymph as deceased. I found them both to be healthy children who had each been vaccinated successfully in two places. The vaccination in each case had run a normal course, and no complications had arisen.

clusion.

In my opinion the death of the child was due to the lung condition, the left lung being so compressed by the accumulation of pus in the left side of the chest as to be incapable of doing any work, and the right lung being at the same time in a partially congested condition. The unhealthy condition of the vaccination wound, and the abscess in the arm-pit consequent upon it, were in my opinion caused by improper treatment of the vaccination wound by want of cleanliness, and possibly by unsanitary surroundings. I do not consider that the condition of the wound was due to the use of improper lymph, since two other children vaccinated from the same tube of lymph as the deceased did not suffer from any complications, and the vaccination in each of them ran a normal course.

ARTHUR PEARSON LUFF, M.D.

CASE 317, REPORTED TO THE COMMISSION BY THE CORONER.

Case of I. H.: report to the Commission of Dr. Arthur Pearson Luff.

On the 1st March 1894, at the request of the Commission, I proceeded to ——, and on the 2nd attended the Coroner's inquest touching the death of I. H., aged three months, who died on the 27th February. A communication had previously been received by the Commission from the Coroner, stating; "I. H., a child three months old, was "vaccinated three weeks ago, and on Monday of last week "erysipelas developed over the body, death resulting from "it yesterday. If the Royal Commission on Vaccination "had made their final Report, I should have hesitated, "knowing how erysipelas can arise, in proceeding to "inquest, but have now fixed inquiry for Friday morning "at ten o'clock at ——, and shall be glad to know if any "representative from Commission will attend. I have "already wired you. If you consider post-mortem neces- "sary, please wire me on receipt of this, so that it may be "made before jury meet on Friday morning."

At my request a post-mortem examination of the deceased child was made.

At the inquest evidence was given to the following effect:—

M. E. H., the mother of the deceased child I. H., stated that the deceased was entirely breast fed, that she was vaccinated in one place, and that for a fortnight after the vaccination the arm went on well. Shortly after the fortnight had elapsed, inflammation commenced around the vaccination spot and spread. The child did not suffer from vomiting or diarrhœa, but had convulsions just before death occurred. She did not know of any cases of erysipelas having recently occurred in the house in which she lived, or amongst her neighbours, or amongst those with whom the child was brought in contact. She was sure that the dress of the child did not rub the vaccination spot, and she did not apply any rags to the arm. Before the inflammation commenced she had dusted magnesia over the vaccination spot, and after the inflammation had started she applied flour to it. For some time past she had constantly noticed bad smells coming from the water-closets in the house.

Dr. E. B. stated that he vaccinated the deceased child on the 8th February. The vaccination was done with lymph taken from the arm of a child named R. H. M., whom he vaccinated on the 1st February with calf lymph, that being the only child vaccinated at the time. The lymph was obtained from Messrs. P. and C., of ——. He inspected R. H. M. on the 8th February, and found the vaccination had been a successful one, and from him he vaccinated the deceased child in one place. On the 15th February he again saw the deceased, and passed the vaccination as a normal and successful one; the child was then in good health. On the 19th February the deceased child was brought to him with a slight swelling of the arm around the area of vaccination, together with some inflammatory redness in the same area. The scab gave the appearance of having been somewhat displaced. On the 21st February (13 days after vaccination), he saw the child again when there was undoubted erysipelas of the left arm, spreading to the left side of the chest. Subsequently the erysipelas spread over the body and buttocks, the rash somewhat subsiding before death took place. The child died on the 27th February (19 days after vaccination). He made a post-mortem examination of the body of the deceased. The scab on the arm about one-and-a-half inches in width, was partially separated. The subcutaneous tissues around the scab were infiltrated with pus. The subcutaneous tissues of the buttocks were slightly infiltrated. The left axillary glands were slightly enlarged, but were not suppurating; there was no abscess about the body; all the organs of the body were healthy. The cause of death was erysipelas arising at the seat of vaccination. He could only account for the production of the erysipelas by the bad sanitary condition of the house in which the child lived. He was not of opinion that the virus of erysipelas could have been conveyed from the lymph taken from the vaccinifer.

Verdict of Coroner's jury.

The verdict was to the effect that the deceased child died from erysipelas following vaccination, the erysipelatous condition being caused by the unsanitary condition of the house, and not caused by the vaccine lymph taken from R. H. M.

I next inspected the body of the deceased child, the condition being as described in Dr. E. B.'s evidence.

Vaccinifer.

I saw and examined the vaccinifer, R. H. M., aged five months. The child had been vaccinated on the 1st February in one place. The vaccination had been a normal and successful one. The arm was quite healthy and the child himself was in good health. No other child but deceased had been vaccinated from R. H. M.

Sanitary surroundings.

I next inspected the house in which the deceased child had lived. An unpleasant smell was noticeable at once on entering the house. The house was one of a row, the house drain passing under the house, and under the passage within the house leading to the front door. A few inches from the front door, and within the passage of the house, was a watertap, underneath which, was a gully connected with the house-drain, and insufficiently trapped. From this gully the smell of sewer gas arose. The house was provided with two water-closets, both inside the house, and both of them having no flushing arrangements whatever; the only flushing that they received was such water

as might be poured down from time to time by the inmates. They were both of the short hopper pattern, the pans being very much cracked, and their condition being extremely dirty. The room in which the lower water-closet was situated was partly used as a scullery, and partly as a sitting room. The soil pipes were unventilated, and an extremely foul smell emanated from both of the water-closets.

Conclusion. In my opinion the deceased child died of erysipelas, arising from the extremely unsanitary condition of the house in which she lived, the erysipelatous virus no doubt gaining access to the system through the vaccination wound. That the erysipelas was not due to vaccination with impure lymph is shown by the following facts:—

(i.) Erysipelas did not appear until thirteen days after vaccination; and

(ii.) The vaccinifer was a healthy child in whom the vaccination had run a normal and successful course, and who did not suffer in any way from erysipelas.

ARTHUR PEARSON LUFF, M.D.

CASE 318, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of E. A. W.: report to the Commission of Dr. Arthur Pearson Luff.

In March 1894 I was requested by the Commission to investigate the circumstances attending the illness of E. A. W., of ——, and the alleged connexion of the illness with vaccination.

The following telegram had been received by the Local Government Board on the 28th February 1894, from Mr. A. K., M.R.C.S., Public Vaccinator for ——:—"Have "a patient seriously ill after calf lymph vaccination. Would "it be advisable for a Medical Inspector to see the case? "Wire reply." In reply Mr. A. K. was informed by the Local Government Board that the Board had referred the matter to the Commission. The Commission was also informed by the Local Government Board that the calf lymph referred to by Mr. A. K. in his telegram was not any forwarded to him by the National Vaccine Establishment.

On the 3rd March 1894 I proceeded to —— and, with Mr. A. K., saw the child E. A. W. at the house of the child's parents. Mr. A. K. informed me that the child, aged four months, was vaccinated by him with a tube of Ferriss's calf lymph, on the 18th February 1894, in three places. On the 25th of February the temperature of the child began to rise, and on the 26th February it reached 104°, from which time it had fluctuated from 100° to 103°. When I saw the child the temperature was 100·1°. The three vaccination spots each measured ·6 of an inch in diameter. They were all scabbed over and looked healthy. There was no particular inflammatory redness around them; no suppuration; no swelling of the arm; no enlargement of the axillary glands. The child was fretful, did not take his food well (he had from the first been brought up on cow's milk); had been sick a few times, but had no diarrhœa. The child was not suffering from any lung trouble, nor, as far as we could detect, was there any morbid condition except the elevation of temperature. I could only come to the conclusion, with which Mr. A. K. concurred, that the elevation of temperature was due to irritation of the nervous system caused by the vaccination. No other child had been vaccinated from the same batch of calf lymph.

On the 7th March 1894 (four days after I had seen the child) I was informed of the death of the child on that day "from nervous shock following vaccination from calf "lymph." I was afterwards informed by Mr. A. K. that for the two days preceding the death of the child the temperature was normal and subnormal; there were no fresh symptoms; the child seemed easier, but his ability to take food diminished; the debility increased, and he died suddenly and unexpectedly. The vaccination places remained quiet, and in the same condition in which they were seen by me. Mr. A. K. certified the death as from "vaccination, calf lymph, nineteen days: exhaus- "tion."

ARTHUR PEARSON LUFF, M.D.

CASE 322, REPORTED TO THE COMMISSION BY MR. J. H. LYNN.

Case of M. T.: report to the Commission of Dr. Theodore Dyke Acland.

M. T., aged 14 years, was re-vaccinated by Dr. G., of ——, a private practitioner, on the 27th September 1893. *Re-vaccination.*

"Blood-poisoning," and that the boy "is probably "crippled for life, and is unable to continue as a post- "messenger." *Alleged injury.*

Calf; from Dr. Renner, preserved in tubes; but no record has been kept by the vaccinator as to the particular batch of lymph used on this occasion. *Source of lymph.*

No record kept; but Dr. G., who says that he never vaccinates from arm to arm, usually receives three tubes every week or fortnight, and vaccinates two or sometimes three cases from each. Four or five other persons were probably vaccinated from the same batch of lymph by Dr. G., all private patients; and, as he has heard no complaint, he thinks it reasonable to suppose that no unfavourable symptoms developed. *Co-vaccinees.*

None. *Sub-vaccinees.*

Dr. G. in vaccination uses sewing needles, which he says "are renewed at intervals, and always carefully cleaned "after each case." *Method of vaccination.*

On the eighth day when the arm was inspected Dr. G. states that "the vesicles had been ruptured and their site "occupied by eschars. This condition I have frequently "found in re-vaccinations for the Post Office, either through "the arm being rubbed, or as I have sometimes been "informed, through one of the boy's colleagues having "given him a punch on the arm. At the time there "were no symptoms leading me to think any special treat- "ment needful." *Course of vaccination and illness.*

The history of the events which followed vaccination is unreliable, and I have been unable to reconcile the conflicting statements. On the 16th April 1894 the boy informed me that on the night after he was vaccinated, when in bed he found that he was suffering from a sore throat, and that the next day or the day after he slipped in the street and hurt his ankle. Mr. T., the boy's father, informed me, and he is corroborated by his wife, that the boy did not have any sore throat but that his brother did, and that he did not slip in the street until Saturday, the 14th October—2¼ weeks after vaccination. The father also states that the boy's axilla was swollen and painful, and this the boy denies. The boy subsequently stated that what he said about the sore throat was untrue.

The facts which seem certain are that he was vaccinated on the 27th September, that he had a moderate amount of inflammation round the pocks, that he subsequently slipped in the street (on Saturday, the 14th October, his father says) and injured his ankle. It is probable that he *was* suffering from sore throat when he injured his ankle, since his mother tells me that she asked Dr. G. what was the matter with him when he examined the boy's throat, asking "whether it was diphtheria or what."

The father informs me that after the fall the boy was able to walk to the Post Office and home; he says that at first there was nothing to be seen. The mother, however, says that when the boy reached home his ankle was swollen and the leg painful, so that she does not know how he reached home. She bandaged the ankle, thinking he had sprained it, and the boy's father, when calling at the Post Office to obtain a certificate for the attendance of the doctor, said his son had sprained his ankle. The boy at the time, according to his mother, attributed his fall to a slip on the pavement and not to pain in his leg, though he had, she says, complained of pain in it previous to the accident. Next day (Sunday) the ankle was more swollen and the leg very painful. On Monday the boy was seen by Mr. W. who, on the 19th April 1894, informed me as follows:—
"I have not any notes of M. T.'s illness, except that I "visited him on October 16th and 17th, and that I re- "commended his removal to St. Thomas' Hospital. I "remember the case well, and the main facts are as "follows. On October 16th I was asked by the father to "give a certificate that the boy was not able to do his "work as telegraph messenger on account of a sprained "ankle, nothing was said about the boy being ill. I "visited him the same afternoon and found him very ill "with a high temperature (above 105) and rapid breathing. "The left ankle was swollen, of a dusky red colour, and "very painful on the least movement. The left arm

" above the elbow was swollen and inflamed. The vacci-
" nation wounds were covered with large scabs. The
" tonsils were swollen, the uvula œdematous. A little
" dulness at back of both lungs. The father was unwilling
" to have the boy removed to Hospital. I ordered the
" ankle to be fixed and lotion applied to the arm. I saw
" the lad next morning, the temperature was a little
" lower, the ankle more swollen, the throat not so much
" inflamed. The arm was much improved, the scabs had
" been removed, and the vaccination wounds looked
" healthy. Dr. McM., of ———, saw the boy in con-
" sultation with me, and agreed that it was necessary he
" should be removed to Hospital. I wrote a letter to the
" House Surgeon, and the boy was admitted to St.
" Thomas' on the same afternoon. On both days the boy
" was somewhat delirious, and was unable to give a satis-
" factory account of the fall, but I understood from the
" father that he had been quite well when he went on duty
" October 14th (Saturday), that while delivering a
" message he had slipped off the kerb and fallen, that he
" had been able to deliver the message and walk back to
" the Telegraph Office, and from the Office to his own
" house. Afterwards the father said the boy had been
" unwell for two or three days previously. He does not
" appear to have been seriously ill on Sunday, 15th. I
" gave a certificate that he was not able to do his duty on
" account of 'injury to ankle.' Before a telegraph
" messenger is employed the Postal Authorities require
" a certificate of good health, signed by a medical
" practitioner."

In a subsequent letter of the same date, Mr. W. further informed me:—" (1.) M. T. most certainly had a sore " throat and enlarged cervical glands. On September 8th " saw H. T., telegraph messenger, who was suffering from " diarrhœa, and gave him a certificate excusing him from " duty until the 12th. He was not on the Sick List " during September or October, except from the 9th to 12th " September. (2.) The arm was inflamed on October " 16th, but the inflammation had subsided by the follow-" ing day. The wounds were not suppurating, and the " axillary glands were but slightly enlarged. The mother " told me that the arm had been more inflamed during the " previous week. (3.) October 16th, is the date I have " entered as that of the first visit to M. T."

On the 17th October 1893, M. T. was seen by Dr. McM. in consultation with Mr. W. Dr. McM., on the 19th April 1894, informed me as follows :—" I have a distinct " recollection of the case you mention, which I saw with " Dr. W. The boy was suffering from acute inflammation " of the ankle joint, in my opinion the effect of a fall in a " strumous lad. The vaccinated arm was inflamed, but not " unduly so. I have seen a good deal of septicæmia, but I " never knew or heard of a case where the invasion was de-" layed for three weeks after inoculation, and in which only " one joint was attacked. The family history is bad. I must " confess that knowing the family, and the well marked " history of injury to the joint, I fail to see how the " vaccination can be blamed."

Mr. J. B., Medical Officer to the —— District Post Office, was away at the time, and did not see the lad himself. The official record of the circumstances is contained in the following letter which the Commission have received :—

General Post Office,
29th May 1894.

Sir,

In compliance with the request contained in your letter of the 8th instant, I am desired by the Postmaster-General to enclose herewith, for the information of the Royal Commission on Vaccination, a copy of the report furnished to this Department by Dr. J. B., Medical Officer to the Post Office for the —— District, on the case of the messenger M. T.

The accident referred to in the report happened about mid-day on the 14th October last, when M. T. slipped from the kerb, causing an injury to his ankle, which was thought to be a sprain; but it was not observed at the Town Sub-Office, where he was working, that anything was wrong, till the evening of that date, when he was sent home.

He was subsequently taken to St. Thomas' Hospital, and remained there some weeks, during which time he received full pay.

I am, &c.,
H. Joyce.

The Secretary,
Royal Commission on Vaccination.

(*Enclosure.*)

Copy.

The Postmaster,

From inquiries I have made after an examination of the lad M. T., I have come to the conclusion that M. T. should not have been at work at the time he met with his accident, as his arm was very much inflamed from the re-vaccination, and there was a certain amount of constitutional disturbance which would make, what in a good state of health, might be a slight accident, become a more serious one.

J. B.,
Medical Officer.

8th April 1894.

The official entry made by Mr. W., who was acting as District Medical Officer for Mr. J. B., was :—" Oct. 16th, " 1893. M. T., injury to ankle."

The boy M. T. was admitted into St. Thomas' Hospital on the 17th October 1893, under Mr. Pitts, for cellulitis of the left ankle. The history given in the notes is that " he had slipped off a kerb last Saturday, October 14th, and " hurt his foot; he could scarcely walk home. The next " day he could not walk, the foot being swollen and " painful. . . . . " No mention is made in the notes at this or at any subsequent period during his residence in the Hospital, of his vaccinated arm, or as to any connexion of the accident by which his foot was injured with the preceding vaccination; in fact, it seems to have only been by chance found out by the dresser that he had been vaccinated. The Sister of the Ward and the dresser of the case (Mr. Laslett) remember the case well, and say that when admitted there were scabs on the points of vaccination, and that there was some trifling inflammation round the pocks, but that there was no discharge from the wounds, which did not require any dressing, and that there was not any axillary swelling. They also state that the boy's hands had to be confined in bags as he was constantly picking at the scabs; and this he admits. On the day of admission (17th October) there was well marked cellulitis round the left ankle joint. No sign of injury or disease of bone could be detected, and the ankle joint was not found to be involved. In the evening three incisions were made (under an anæsthetic) on the outer side of the ankle without finding pus. Suppuration occurred later (21st October) and a drainage tube was inserted. On the 30th October a second collection of pus on the inner side of the ankle was opened and drained. During his stay in Hospital there was considerable constitutional disturbance, the temperature on two occasions, on the 4th and the 7th November, being above 104°. On the 5th November the boy became so noisy that he had to be removed from the Ward. On the 10th November it is stated that lymphangitis spread up the *right* (probably a clerical error for *left*) leg. On the 6th December the foot was put up in a plaster of Paris splint and left. The patient was discharged on the 7th December, having been in Hospital seven weeks.

On the 12th April 1894 the boy was re-admitted to St. Thomas' Hospital with ankylosis of the right ankle. The foot was extended and the tends achillis was tense. The tendon was divided and the foot put up in plaster of Paris. The boy's general health seemed fairly good, and no visceral disease was detected. At the seat of vaccination there are now (April 1894) five scars, two old ones more or less obliterated, and three recent ones. Of the latter one is normal, in one there is slight, and in one considerable thickening and some puckering of the cicatrix, showing that there has been a considerable excess of inflammation round the vaccination pocks. There is no pyrexia, and all active local inflammation round ankle or at the site of vaccination have ceased. He was discharged from the hospital with the foot fixed in a plaster of Paris splint.

Family and previous history.

Nothing of importance elicited.

Conclusion.

M. T. suffered from some excess of inflammation round the vaccine pocks; before the inflammation had subsided, and possibly while he was suffering from acute tonsillitis, he slipped and injured his ankle. The injury set up cellulitis round the ankle, and ankylosis of the joint followed.

The question has been raised as to whether the accident occurred in consequence of some pre-existing painful condition of the leg, and whether the severity of the inflammation which followed the mechanical injury was determined by the constitutional disturbance excited by vaccination. I have been unable to ascertain any facts which tend to show that septic absorption was going on from the vaccination pocks, either previous or subsequent

to the injury to the ankle; there was neither excessive inflammation round them, lymphangitis, suppuration, or glandular abscess, when the lad entered St. Thomas' Hospital. The lesion of the foot was considered to be one consequent solely on the local injury. The fact that the lad had continued his work until the accident occurred, and that the complaint made to the Post Office Medical Officer and entered by him was, that the lad had injured his ankle, strongly support the view, which *primâ facie* seems probable, that the cellulitis of the foot and its sequelæ were directly the consequence of the injury, and not a local manifestation of a general septic infection from the vaccination wounds, determined by the mechanical injury of the parts.

THEODORE DYKE ACLAND, M.D.

CASE 323, REPORTED TO THE COMMISSION BY THE CORONER.

Case of M. R. B.: report to the Commission of Dr. Theodore Dyke Acland.

Vaccination. M. R. B., born in the —— Lying-in-Hospital on the 25th March 1894, was vaccinated there when three days old by Dr. W. C. G., on the 28th March 1894.

Death. 18th April 1894.

Certified cause. "Vaccination; blood poisoning."

Certified by. Dr. W. C. G.

Coroner's inquest. 23rd April 1894, and, by adjournment, 7th May 1894. A copy of the depositions taken is appended to this report.

Verdict of Coroner's jury. That "M. R. B., aged three weeks, was found dying "and did die at ——, from the mortal effects of dropsy "following idiopathic blood disorder, and after hearing "the evidence the jury consider that there is no reason to "connect the death with vaccination."

Source of lymph. Direct from the arm of E. A., who was born in the —— Lying-in-Hospital. She was a healthy child, weighed at birth 7 lbs. 2 ozs., and on the 14th day 7 lbs. 8¼ ozs. This child E. A. had been vaccinated in turn from F. W. S., who had been vaccinated at the public vaccination station at ——, and forwarded to Dr. W. C. G., as a source from which to obtain lymph.

Vaccinifer. E. A., of ——, now cared for by the Sisters of Home at ——. When admitted to the Home, the Sister in charge informs me, she was a healthy, well-looking infant, rather small for her age. At the time of my enquiry she had been transferred to ——, and was reported to be well; the vaccination wounds being healed and the child having recovered without any complication.

Co-vaccinees. Seventeen children in all were vaccinated from the child, E. A.; the child M. R. B., the subject of this report, and sixteen other children. Of these sixteen co-vaccinees, two could not be traced but the remaining fourteen were inspected on or about the 10th May 1894.

The children vaccinated from E. A. were as follows:

(i.) A. H., of ——. Vaccination (when six days old) normal; four scars completely healed, healthy but not well marked; no enlargement of glands. On nates the remains of some eczematous eruption now quite healed; the same on groins; the child is otherwise healthy.

(ii.) M. W., of ——. Vaccinated when five days old. The arm is said to have been much inflamed during the second week; the inflammation not subsiding for three or four weeks; not extending so far as the hand. There was no enlargement of axillary glands and no general eruption. Four scars; three completely healed, without induration; one is covered with a yellow scab but is not surrounded by any inflammation. No eruption round nates: nutrition fair. Domestic circumstances unsatisfactory, but they seem to have no bearing on case.

(iii.) E. D., of —— Home, at ——. Vaccination (when six days old) was followed by a considerable amount of inflammation, which subsided completely before she left ——. The Assistant Matron of the Home says that a rash came out after vaccination. Mrs. F., who nursed the child for three weeks, says that the child's arm was dreadfully inflamed after the first week, and that there was a considerable amount of suppuration. It was dressed with fuller's earth and olive oil, and she says that she has had the child's arm wet with vomited milk which she did not attempt to wash off. She says that after vaccination the child had a rash all over the vaccinated arm, and some on her face; the child also suffered severely from thrush; no abscess formed in the axilla. She says that the arm was practically well when the child was sent away within a month of vaccination. The child was hand-fed and out at nurse.

(iv.) E. D——y, of ——. Vaccinated when seven days old. Inflammation is said to have commenced round the arm a week after vaccination. During the second week there was a papular eruption over the body, which disappeared during that week. There are now four normal scars, completely healed; no enlargement of glands; no eruption round nates; slight intertrigo in groins.

(v.) J. H., of ——. Vaccinated when four days old. Examined by Dr. L., who reports that there were four healthy scars, their surfaces smooth and reddened; no evidence of destruction of tissue and no enlargement of glands. On the 7th April, ten days after vaccination, the child began to have slight snuffles. On the 7th May she had no rash on the body; the buttocks had not been sore. The mother has one other child who is said to have been in good health. She has had no miscarriages; has had good health since her marriage and has not suffered from sore throat. Last autumn she lost a considerable amount of hair, but did not feel unwell. About Christmas she had a rash all over her body in reddened patches, lasting for two or three months, and since has had occasional headaches; she has had no other symptoms. She is separated from her husband. No history could be obtained as to father's health. There is a suspicion that this child may be the subject of congenital syphilis, but the evidence is very uncertain.

(vi.) A. C., of ——. Vaccination (when five days old) normal. Four normal scars; no enlargement of glands; no eruption on trunk; slight lichen on face.

(vii.) M. M., of ——. Vaccination (when six days old) normal. Four completely healed scars; no enlargement of glands; no eruption on trunk; nothing abnormal detected on abdomen.

(viii.) E. S., of ——. Vaccinated when seven days old. This child's mother could not be traced.

(ix.) E. E., of ——. Vaccination (when two days old) normal. There are now four scars without induration; the two inner ones are glazed, looking as if there had been some excessive inflammation; the two other ones are normal. Between the scars is a small amount of superficial scaly eruption. No enlargement of glands; no general eruption; some small amount of papular eruption round nates, but none on trunk.

(x.) M. R. B., of ——, the subject of this report.

(xi.) M. M——m, of ——. Vaccinated when six days old. The arm was rubbed during the first two or three days and the healing of the wounds was delayed. There are now four scabs *in situ* without surrounding inflammation. The axillary glands are very slightly enlarged. There is no rash on trunk or nates: some slight amount of intertrigo in groin.

(xii.) A. G., of ——. Vaccination (when two days old) normal. There are now four normal scars; no glandular enlargement; some eczematous eruption on nates. The child looks and is said to be well.

(xiii.) M. F. P., of ——. Vaccination (when one day old) normal. There are two minute scars completely healed; no enlargement of glands; no general eruption. Nothing abnormal detected. Nutrition excellent.

(xiv.) A. C., of ——. Vaccinated when two days old. No such person is known at the address given, and I have been unable to trace the case.

(xv.) M. B——k, of ——. This child was traced to ——. Vaccination (when two days old) was said to be normal; but the child is now ill-nourished and

ill-developed. There is a papular rash round and over the nates, but none on trunk or abdomen. She is suffering from gastro-intestinal catarrh and frequent vomiting. Her condition is critical. There are four well-healed cicatrices without surrounding inflammation, and no enlargement of glands.

(xvi.) P., of ——. Vaccination (when one day old) normal. Four completely healed healthy scars. Nothing abnormal detected on physical examination; nutrition good.

(xvii.) E. P., of ——. Vaccinated when six days old. Examination made by Dr. L. Arm said to have been inflamed during the second week. On the 17th May there were four normal scars without induration; no enlargement of glands; no abnormal physical signs. The child's general condition was good.

From the above account of the vaccinifer and co-vaccinees of the child M. R. B. it would appear that the general results of the vaccinations were satisfactory, and that there was no tendency to suppuration of vesicles, enlargement of axillary glands, formation of abscess, septic infection, or anything which would lead to the supposition that the source of lymph was tainted or that the lymph when used was unsuitable for the purposes of vaccination.

e. None.

l of ation. Dr. W. C. G. is in the habit of placing a drop of glycerine on each vesicle on the arm of the vaccinifer and, after he has scarified them through the glycerine, he vaccinates with the extract of lymph which is so made. He vaccinates in four places, widely apart. There is no evidence in the present case that the method of vaccination contributed in any way to producing abnormal results in the arms in the case of the children vaccinated.

of ation ness. The child M. R. B.'s vaccination was performed on the 28th March, when he was three days' old. He was inspected by Dr. W. C. G. on the 4th April and discharged on the 7th April. On the latter day the arm, when seen by Dr. L., was slightly inflamed, and on the 11th, four days later, when the child was brought back to the Hospital, the vaccination marks showed some slight inflammatory thickening round their bases; the lower and external wound was ulcerating, and there had been a slight loss of tissue. Each pock was covered with a greyish scab such as is often seen at the end of the second week; there was no enlargement of the glands. According to Dr. L., the child did not look so well as when he left the Hospital, but, in spite of this, the mother informed him that she was going to wean the child and take a place as a wet nurse. He advised her not to do so, but she said it was necessary because she was so poor. According to the evidence given by the grandfather, D. M., at the inquest, the child seemed fairly healthy until Tuesday, the 17th April, the evening before his death. On that day he noticed a dark-coloured swelling on the little finger of the right hand, but the child's general health seemed still to be reasonably good. The vaccination wounds were then, in his opinion, healing well. During the night of the 17th April the child began to appear ill, and had several convulsive seizures of both hands and legs. Mrs. C. H. H., wife of a neighbouring clergyman, was then called, and she says that she noticed a mark on the right hand, the same side as the vaccination. She did her best to treat the child. The next morning she thought the child was getting on well, but in the middle of the day she noticed two black marks on his right leg and suggested that he should then be taken to a doctor. The child was then taken to Mr. E. B., of ——, who stated that when the child was brought to him, he was moribund and had much discolouration of the face and sanious abscesses on the hand and legs. The vaccination wounds, he stated, seemed healthy and clean; the vesicles had shrunk. He subsequently formed the opinion that the child died of blood poisoning, but he was unable to say what the cause was, although there was evidently some source of irritation after vaccination.

or. ami- A post-mortem examination was made by Dr. C. C. on the 24th April 1894, the details of which he gave at the Coroner's inquest, and they will be found in the depositions appended to this report. Dr. C. C.'s conclusions are stated more fully in his own report on the post-mortem examination, for which I am indebted to him; and this report I have also appended. It will be noticed that the examination was made six days after death, and that in consequence considerable alteration in the appearance of the tissues had taken place. The chief points to be noted are, firstly, that three of the vaccination scars presented an entirely healthy appearance; the fourth had its scab adherent to it, but there was no sign of inflammatory infiltration of the tissues round it and no sign of suppuration or abscess or inflammation of the axillary glands. On the right little finger there was an abscess not connected with the joint, and on the inner side of the wrist there was a superficial inflammatory mass just on the point of breaking down. On the right leg there was a dusky scar having the appearance of the remains of a large bulla. Below this there was no pus found, only some œdema of the tissues. The pericardium contained about a drachm of blood-stained serum. There was one spot of hæmorrhage on the surface of the right ventricle and the kidneys were soft and easily broken down.

General surroundings. Most unsatisfactory. When the child was born the mother had been left by her husband, and was in very straitened circumstances. The child was vaccinated when he was three days old; was taken from the hospital before the vaccination wounds were healed; and, in spite of his health being then less good than it had been previously, the mother left him when he was 18 days old. He was then weaned and fed on condensed milk. Nothing of importance has been ascertained as to the sanitary condition under which the child lived, or as to the way in which the arm was treated.

Previous history. The child was born at full time, and at birth was apparently healthy; he then weighed 6 lbs. 6 ozs.; on the seventh day he weighed 6 lbs. 15 ozs.; and on the 14th day, 7 lbs. 1 oz.

Conclusion. Under the circumstances enumerated above, it is hardly to be expected that any child should thrive. Born under distressing circumstances, vaccinated when of very tender age; the satisfactory conditions of a hospital changed, while still suffering from effects of vaccination, for the less satisfactory ones of his home; left by his mother when still unwell in order that she might obtain a situation as wet nurse, it is hardly surprising that the child succumbed. Whether all the circumstances enumerated combined to produce such a profound alteration in the child's nutrition, as suggested by Dr. C. C., as to cause his death, or whether the blood condition did actually result from some septic absorption from the as yet incompletely healed vaccination sore, there is no evidence to decide; but it can hardly be doubted that the conditions under which the child was living were sufficient to make that which, in a healthy well-fed child might prove to be little harmful, dangerous and even possibly fatal. It is not easy to apportion with any certainty the part played by each of the factors concerned in bringing about the fatal issue, though it can hardly be doubted that the general disturbance caused by vaccination, was one link in the chain of events which terminated in the child's death. But vaccination was not the only cause, and the evidence obtainable does not warrant the conclusion that the operation was followed by any complication capable of causing death apart from the other known circumstances which lessened the child's vitality and still further depressed his feeble powers of resistance.

THEODORE DYKE ACLAND, M.D.

(Copy of depositions taken at Inquest.)

Depositions of witnesses taken and acknowledged on behalf of our Sovereign Lady the Queen touching the death of M. R. B. at ——, on Monday, the 23rd day of April 1894, before C. L. D., Esquire, one of Her Majesty's Coroners for ——, on view of the body of the said person then and there lying dead.

D. M., having been sworn upon the day and year and at the place above mentioned, deposed as follows: I reside at ——. I am a decorator. I identify the body as that of my grandson (named as above) three weeks of age. He is a son of my daughter. The father is I. B., who is at the Cape. The child seemed healthy till evening before death. My wife awoke me. The child was sleeping in a cradle. My wife fed the child on the bottle (Swiss milk). She fed it at 2 a.m. She was going to feed it again at 4 a.m. and found it looking curious. This was Wednesday morning, 18th inst. Mrs. C. H. H., the neighbour, was called up,

and attracted my attention to red and swollen look of little finger of right hand. The child was taken to the doctor about 1 p.m. At this time the child did not look all right. It seemed sleepy all the morning. I went to the hospital and told them the condition of the child. When I got home the child was dead—died about 4.50 p.m. It was vaccinated at Hospital. I have had charge of the child for a fortnight. It had a very bad arm when it came to me. It got worse. As far as I know the child was healthy before vaccination.

C. H. H. deposed: I reside at ——. The wife of F. W. H., Clerk in Holy Orders. I washed the child the morning before death. I noticed a mark on the right hand, not the same side as vaccination. The vaccination mark was healing. On Wednesday morning, about 4.30 a.m., I was called up. The child's hands were clenched, lips were blue, face was twitching. These signs passed off. I gave a dose of castor oil. At 11 a.m. I saw the child again. It seemed asleep and comfortable. At 12 mid-day I noticed two black marks on right leg. I suggested the child should be seen by a doctor, and about 2 p.m. it was taken to a doctor.

E. B.: I am a registered medical practitioner residing at ——. After 3 p.m. on Wednesday, 18th inst., deceased was brought to me at ——. The child was moribund, and had a great discolouration of face, and sanious abscesses on hand and leg, which side I forget. I made inquiry and found the child had been vaccinated when a fortnight old. The wound appeared healthy and clean. The vesicles had shrunk. I formed opinion that, from what I saw, the child died of blood-poisoning, but what was the cause of the blood-poisoning I cannot say. It might be due to many causes. I cannot say what sort of lymph was used. There was some source of irritation after vaccination evidently.

Inquest adjourned till Monday, 7th May 1894, Jurors and Witnesses being bound over in Recognizances of 10*l.*, each to appear on that date at ——.

Resumed at —— on 7th May 1894.

C. C., M.D., deposed: I made post-mortem examination on 24th April, along with Dr. Acland and Dr. W. C. G., and others. The body weighed 7 lbs., was 23 inches long, and fairly nourished. Abdomen was rather tumid. Child full time. Hands clenched, pupils moderately contracted. Right leg below knee, purple in front, dusky red behind, and was dropsical at discoloured parts especially on inner side above ankle. Little finger on right hand had swelling over first joint (purple). On opening, grey pus under skin, no pus in joint. On same side of right arm above wrist, inflamed patch, bright red in colour, size of a shilling, rising about $\frac{1}{10}$ inch. It contained no pus, put showed dark red of phlegmonous inflammation. On shoulder and arm (left) were four marks of vaccination, about two inches distant. The two upper had healed, the crusts having fallen, branny scales. The two lower were still covered with black crusts about $\frac{1}{4}$ inch diameter, and $\frac{1}{10}$ inch thick. The outer and posterior had a narrow margin of discoloured skin. Incision showed no suppuration beneath crust, nor in tissues of deltoid muscle. Underlying tissues were normal. Absorbent glands of axilla were same on both sides. In both they were red in colour, and natural consistence, free from inflammation. Absorbent glands on right groin were the same. Brain was very soft from decomposition. Vessels on surface not congested. Dura mater normal. Pia mater normal, pink, no trace of inflammation. Abdomen, some dropsical fluid at lower end, and back of peritoneum. Chest tissues were moist. Around the heart (pericardium) 2 or 3 ozs. of fluid, blood red colour. Surface of heart, white; opaque. At base of heart, round red spots. Ventricles empty. Inner surface of right ventricle endocardium was pale, left deeply stained with blood, also valves. The posterior part of left ventricle was soft and red. Trachea and large bronchi contained no mucous, lining membrane was deep red. Lungs collapsed at free borders, congested in lower lobes. No congestion or hæmorrhage of pleura. Liver was usual colour, size, consistence. Spleen very soft, 1 oz. in weight. Deeper parts of intestine stained from decomposition. No congestion on surface or in stomach. Kidneys felt like cyst. On section the interior had grey pulp. Half due to decomposing, but also to decease during life. I think the cause of death was an idiopathic blood-disorder, which was followed by dropsy or œdema.

W. C. G., M.D., Senior Physician ——, &c.: I vaccinated child on 28th March. It was aged four days. It was healthy. Arm-to-arm vaccination. The other child healthy, as I have investigated the source. This morning I received a telegram regarding the other child describing it as quite well. The other children vaccinated at the same time from same source are all well and healthy. The child from which we vaccinated is examined by the vaccinating officer of the district. Anti-septic precautions are taken. The reason why we vaccinate so early at —— Hospital is because most of the women who come in are single, and the children are lost sight of once they leave the Hospital, and would escape vaccination. The mother leaves the Hospital in 14 days. Unhealthy children are not vaccinated.

(Copy of Dr. C. C.'s report on post-mortem examination.)

Case of M R. B., aged 26 days. ——— Mortuary, 24th April 1894.

This case is not free from difficulty; and it has been the more difficult to find the cause of death owing to the advanced state of decomposition, six days after death.

Some of the appearances, as given in the notes, are not inconsistent with a diagnosis of blood-poisoning in the surgical sense of virulent matter absorbed from a wound; such as the livid mottling or streaked appearance of the face and arms before death; the blood-stained fluid in the pericardium; the spots of extravasated blood on the surface of the heart; and the staining of the membrane lining the left cavities of the heart, the mucous membrane of the windpipe, &c.

On the other hand, no obvious source of such virulent matter was found post-mortem: there was no suppuration or other diseased action at the navel. The four vaccinated places on the left arm were healed, and altogether free from traces of inflammation. The absorbent glands were in the same state in the arm-pit of the unvaccinated as of the vaccinated side, and on both sides, as well as in the groin, to all appearances healthy. The small abscess round the first joint of the little finger of the right hand, and the boil or phlegmon above the wrist on the same side, did not appear to be sources of blood-poisoning, but themselves part of the general disease.

I am therefore inclined to set aside the diagnosis of blood-poisoning (as given by Dr. E. B. at the opening of the inquest) in the strict or surgical sense of the term, and to substitute for it the disorganization or decomposition of the blood in its own proper constituents, whereby the water and colouring matter had escaped from the vessels causing the dropsies (described in the notes) in the serous cavities of the chest and abdomen and under the skin of the right leg, as well as the various discolourations.

The organs which should have thrown most light upon the exact nature of this disorganization of the blood were the kidneys; they had almost certainly been seriously diseased, but they were found so soft and decomposed that nothing could be made of them for the purpose of more exact diagnosis.

After weighing all the facts of the case, I am of opinion that the disease was of the nature of an idiopathic or "spontaneous" blood disorder such as not unfrequently occurs in infants newly born or in the first weeks after birth.

As to the question raised at the opening of the inquest, whether the infant's vaccination three weeks before it died had not contributed in some way to induce the disease or to make it fatal, I have to state, for the information of the jury, that the cases on record of such blood disorder have all occurred (so far as I know) in infants who have not been vaccinated (one such case, the subject of inquest, occurred in my own practice on the 5th of April last). Further, if it be assumed that the vaccine matter had been absorbed into the circulation, without leaving any anatomical traces of septic action, and had so acted as a general blood-poison, such absorption should have taken place about two weeks before the child died.

C. C., M.D.

——, 30th April 1894.

CASE 326, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of L. E. B.: report to the Commission of Dr. Theodore Dyke Acland.

L. E. B., born in the ——— Lying-in-Hospital on the 5th April 1894, was vaccinated there when six days old by Dr. W. C. G., on the 11th April 1894.

24th April 1894.

" Congenital syphilis; coma."

Mr. E. B., L.R.C.P.I.

Direct from the arm of J. G., of ——.

J. G., when inspected, was a stout well-nourished child aged four months. He is the youngest of six children; the eldest is (May 1894) nine-and-a-half years old; one died at five weeks old in 1890. The child's skin is clear; he has no eruption; no enlargement of glands. The bones are natural. There is no evidence of disease of the viscera. He is not liable to diarrhœa. He shows no sign of congenital or acquired syphilis. There are (4th May) four healthy vaccination scars, without any sign of induration or of ulceration. Four of the children were examined; in none of them was there any sign of syphilis. They had neither syphilitic teeth, interstitial keratitis, eruption, disease of bones, or of glands, except in the case of one child (C.) who had a large gland on the right side of the neck. They are all well-grown children with no appearance of cachexia. The mother appears to have, as she says she has, good health; she has a clear skin without any eruption. She had had no miscarriages and I was unable to elicit any information which would make me even suspect that she has suffered from syphilis.

J. G. was vaccinated from J. M., of ——, with six other children. With the help of the vaccinator, Mr. E. C. G., and Dr. W. C. G. I was able to trace all these children, and examine them on or about the 7th May 1894, nearly five weeks after their vaccination. They are as follows:—

(i.) E. R., of ——. Vaccination normal. Two scabs are still adherent to the vaccination pocks; there is no induration round the points of insertion; no inflammation; no rash on trunk or extremities. In the right exilla there is a small excoriation about the size of a sixpence, without induration and with very little discharge. There are neither rash or nates nor mucous tubercles round anus. The child appears to be in good health; she is the youngest of eight children, all of whom are alive except one, who died at the age of four. The child shows no evidence of syphilis.

(ii.) L. B., aged seven months, of ——. A well grown child in whom vaccination was normal. When inspected there were four healthy recent scars without induration or enlargement of the axillary glands; there was no rash of any kind on the trunk or extremities; there was some moist excoriation round the anus, which was doubtless due to the fact that the child had dirty wet cloths on. She is the second of two children; the other one is healthy. Neither of them show any sign of syphilis.

(iii.) S. N., aged six months, of ——. When inspected on the 16th May, three of the pocks had completely healed, but the arm was a good deal inflamed, and round the fourth pock there was some diffuse induration which was not parchment-like, but seemed to be part of a general inflammation of the upper part of the arm. The pocks are said to have been rubbed; the cicatrices look normal; there was no sign of ulceration, and no rash on trunk or extremities, nor mucous tubercles round mouth or anus. Inasmuch as the arm was not well when first seen, the child was inspected again on Tuesday the 19th June; the arm had then completely healed. The mother says that she had no trouble of any kind with the vaccination; the child had no enlargement of glands. The scab which was adherent when the child was first seen on the 6th May, fell off on the next day. The pocks are now (19th June), completely healed and there are five healthy scars. There is no swelling in the axilla, and no rash upon the trunk. There are a few minute spots of lichen on the arms, and some slight eczema round the anus. The child is pale, but there is no sign of syphilis either inoculated or congenital.

(iv.) E. N., of ——. Vaccination normal. Four scars all healthy; no enlargement of glands; no eruption on body; no mucous tubercles; a few minute papules on body. This child is the third of three, all of whom are healthy. There is no evidence in the child of syphilis, either inoculated or congenital.

(v.) A. W., aged four weeks, of ——. Vaccination is said to have been accompanied by a considerable amount of inflammation, and by some ulceration of the vesicles; a mass of glands formed in the axilla as large as a hen's egg, which has now subsided. The pocks show no sign of ulceration. There are four scars; three of them healthy, one of them with a little inflammatory thickening round it. The glands in the axilla are enlarged and do not appear to be suppurating. The child is anæmic and has a little eczema in the folds of the groins, but no eruption on body or extremities: and no sign of syphilis can be detected.

(vi.) W. B., of ——. Vaccination normal. Four healthy scars; one scab still adherent; no induration round scars; no enlargement of glands; no eruption on trunk or extremities; no mucous tubercles; skin and complexion clear. The child seems in good condition but does not look healthy; the house and surroundings were filthy. There is no sign of congenital or inoculated syphilis.

From the above it will be seen that there is nothing in the condition of J. G.'s co-vaccinees to give ground for the suspicion that syphilis was inoculated at the time of vaccination. In two cases (Nos. iii. and v.), vaccination was not normal, but the lesion was in both instances inflammatory. In one of these cases (No. iii.), round one of the pocks there was some thickening when first seen, but the child was seen a month afterwards and was found to be quite well, the pocks having healed without ulceration or any other abnormal symptom. Dr. Sweeting of the Local Government Board, who visited these cases in conjunction with Mr. E. C. G., and independently of Dr. W. C. G. and myself, came to the same conclusion as that which is expressed above.

Note.—Supposing that the child L. E. B. was inoculated with syphilis at the time of vaccination, it is probable that her vaccinifer, J. G., or some of the children who were vaccinated at the same time as her vaccinifer, would show some sign of that disease, inoculated from the child from whom J. G. was vaccinated. After inspection of all these children, I am of opinion that neither J. G. nor any of his co-vaccinees suffered from syphilis either congenital or inoculated at the time of vaccination.

Vaccinifer of vaccinifer.

J. M., from whom all these children were vaccinated, is a large, healthy, looking child, in whom vaccination was normal. He has fine healthy recent cicatrices without induration; without enlargement of glands, eruption on trunk or extremities, mucous tubercles, nodes, or evidence of visceral disease; his bones are natural, and his skull well formed. He shows no sign of syphilis, either congenital or acquired.

Co-vaccinees of L. E. B.

On the same day and at the same time nineteen children were vaccinated from J. G.; the child L. E. B., the subject of this report, was vaccinated fourth in order. With few exceptions I have, through the courtesy of Dr. L., been able to trace these children and I inspected them on or about the 10th May, twenty-nine days after vaccination, with the following results:—

(i.) J. W., of——, was vaccinated when three days old and discharged from hospital on the ninth day. There is said to have been subsequently inflammation round the pocks, spreading from elbow to shoulder, with a considerable amount of discharge. There was no general eruption on the body and the child has been well since. The arm was treated with bread poultices and olive oil. When seen, there were four small scabs still adherent to the pocks; without induration; with no enlarged glands in the axilla; no rash on trunk, extremities or nates. The child's nutrition was fair and he showed no sign of syphilis either congenital or acquired.

(ii.) L. H., of——. Vaccination (when four days old) normal. Two of the pocks are still covered with scabs and there are two normal scars without induration; no enlargement of glands; no eruption on body or nates. No evidence of syphilis.

(iii.) A. W., of ——. Vaccination (when five days old) normal. There are four normal scars; no enlargement of axillary glands; there has been no general eruption on the body; there is a small patch of lichen on the left cheek and on the nates and folds of the groin there is a scarlet papular eruption which was present before vaccination and is a simple eczema. There is no evidence of syphilis in the bones, skull or viscera.

(iv.) L. E. B., the subject of this report, was vaccinated immediately after the child A. W.

(v.) M. E. W., of ——. This child's mother has left the address given and I have been unable to trace her. My communication to her was returned marked "unknown" on the 8th May 1894.

(vi.) M. F., of ——. Vaccinated when seven days old. Nothing was noticed wrong with the arm when she left the Hospital, but it afterwards began to inflame and continued inflamed for about a week. There was very little discharge from the pocks, and no enlargement of glands. There are now four large vesicles partially covered with scab; they look as if there had been a considerable amount of inflammation. There is no induration round them; there is no eruption on the trunk, extremities or nates. The child's nutrition is fair, and physical examination does not give any evidence of syphilis.

(vii.) S. H., of ——. Vaccination (when one day old) normal. There are now four scars; three normal; one covered by scab but without any surrounding induration; there is no enlargement of glands; no general eruption on trunk or extremities; a very slight papular eruption on nates. Physical examination does not give any ground for suspecting syphilis.

(viii.) L. L., of ——. Vaccination (when six days old) normal. Four healthy scars; without surrounding induration; there is no enlargement of axillary glands; no eruption on trunk, extremities or nates. No sign of syphilis.

(ix.) E. H., of ——. I was unable to see this child as she had been sent into the country, but a lady who had charge of the child in —— reported to me on the 8th May 1894 that "the child got on well and was "certainly a most beautiful baby."

(x.) M. S., of ——. Vaccination (when six days old) was followed during the second week by inflammation, which spread from shoulder to elbow. There are now four pocks covered with scab; the arm is dusky and looks as if there had been a considerable amount of inflammation. There is no enlargement of glands; no eruption on body; and physical examination does not show any sign of syphilis.

(xi.) A. M., of ——. I have been unable to trace this child.

(xii.) E. S., of ——. On the 10th May 1894 Mrs. S., the mother of this child, wrote to me that the child was covered with a rash like measles; this rash lasted only for three days and then entirely disappeared. Vaccination seems to have been normal. On the 21st May, when I saw the child, nearly six weeks after vaccination, she had four healthy scars; one was covered with a scab which was just peeling off; there was no induration round them; no sign of ulceration; no enlargement of glands; there was a little intertrigo in the groins and some slight soreness round the anus; but no sign of mucous tubercles; there were a few spots of lichen on the thighs. The child's nutrition was good; and there was no evidence from physical examination that the child was the subject of syphilis. She was suffering severely from aphthous stomatitis.

(xiii.) S. B., of ——. Vaccination (when six days old) normal, without complication of any kind. There are four completely healed healthy cicatrices. The child shows no sign of syphilis.

(xiv.) C. L., of ——. Vaccination (when two days old) normal. Four scars, all healthy; no eruption; nutrition good. No sign of syphilis.

(xv.) G. G., of ——. Vaccination (when five days old) said by mother to have been normal. There are four scars; two of them healthy; two surrounded by a papular eruption; below the lower and the outer one there is a single pustule about the size of a pin's head; there is no induration round them; no enlargement of glands. On the face, and especially on the right side, and on the scalp, trunk, and legs is a discrete papular rash; it fades entirely on pressure; there is no pigmentation. The nates are healthy; the nutrition is good. The appearance of the rash leads to the conclusion that it is a papular form of eczema. Neither the condition of the points of inoculation or the appearance of the rash give ground for the suspicion that the child is suffering from syphilis.

(xvi.) M. P., of ——. Vaccination (when six days old) normal. Four completely healed scars without induration; the axillary glands can just be felt. There is a faint papular rash on nates and some nasal catarrh. When seven days old the child had ophthalmia. She is the third child; the two previous ones died of wasting; one at six and the other at twelve months. There is nothing in the history of the case to suggest that syphilis was inoculated at the time of vaccination. Though the family history and the present condition of the child give rise to suspicion that she may be the subject of inherited disease, at the same time there is no unmistakable evidence that this is the case.

(xvii.) E. K., of ——. Vaccination (when thirteen days old) normal. There are three scars covered with scab, but without induration; there is no enlargement of glands. There is some intertrigo in groins, but no eruption on nates; there is a faint papular rash on the face. No evidence of congenital or acquired syphilis.

(xviii.) E. P., of ——. Vaccination (when twelve days old) normal. Scars healthy. Child's condition good. Physical examination gives no evidence of syphilis, acquired or congenital.

(xix.) M. P——e, of ——. Vaccination (when two days old) normal until the third week, when the wounds were quite healed. A crop of pustules then broke out round the upper vesicles, and there is now a pustular eruption spreading over the shoulder and down the arm as far as the hand. The pustules are mostly discrete and dying away. One or two on the head are covered with scab. They vary in size from a minute point up to three-eighths of an inch in diameter. The most recent of them have a white vesicle in the centre and are surrounded by an erythematous blush. The vaccination wounds are completely healed; there is no induration round them. In the axilla are the remains of a large pustule. The child's nutrition is fair, and she does not show any definite signs of congenital syphilis, but the mother appears to be and says she is out of health. The child is the youngest of seventeen children. Of the last five, one only is alive and healthy; she is now seven years old. The second was still-born; the third died at ten months of wasting; the fourth died at four months of wasting. The mother has also had one miscarriage four years ago. The family history suggests the possibility of a syphilitic taint in the child, but physical examination does not give definite evidence that such is the case. The course of vaccination, the appearance of the wound, and the date of appearance and nature of the eruption, do not suggest any suspicion that syphilis was inoculated at the time of vaccination.

Thus of the nineteen children vaccinated from J. G., including L. E. B., the subject of this report, two have not been traced. Of those seen not one presented on the 10th May, thirty days after vaccination, any sign that would give ground for the suspicion that they were suffering from syphilis as a consequence of vaccination. In two of them (Nos. xvi. and xix.) the history of the case does not exclude the possibility of their being the subjects of congenital syphilis; but both these children were vaccinated considerably later than L. E. B.; and even if L. E. B. had been inoculated with syphilis owing to some carelessness on the part of the vaccinator, it is not possible that she contracted the disease from either of these two cases in the course of vaccination.

Sub-vaccinees.

None.

Course of vaccination and illness.

Notes taken in the Hospital concerning the infant L. E. B. show that the child was born on the 5th April 1894; at birth she weighed six pounds, was apparently healthy and took her nourishment well. On the 11th April, the day of vaccination, the motions became green and the buttocks slightly sore. On the 14th April the motions were natural and the buttocks are reported healthy. Three days later, that is six days after vaccination, several patches of erythema appeared on the face and arms, and the child's

general condition appeared to be not so good. Her weight on the 14th April was five ounces less than at birth. The eruption on the face was not considered by Dr. L. to be specific, and he only applied boracic ointment. On the 18th April the mother was discharged from the Hospital. The child's condition was then described as only moderately good; the rash was still present, but nothing else was noted and the child was not then suffering from snuffles. Mrs. B., the child's mother, informs me that she noticed nothing wrong with the child until the 13th April, two days after vaccination, but she says that as she did not wash the child she had no opportunity of examining her body. On that day she noticed "blotches" on the child's chin, forehead, and the back of her hand, and also a sore on the side of the anus something like a pimple, and the size of a threepenny-piece. She says that when she first noticed this, the child had green motions and diarrhœa, and that the child had suffered in a similar manner previous to vaccination. The blotches, she says, subsequently appeared on the dorsal surfaces of the knees, hands, and feet, while dry scaly patches formed round her mouth. She believes that no sores formed upon the body. The vaccinated arm gave her no trouble at all; she says there was no inflammation round it, and no swelling in the armpit; but the eruption on the child's body and face getting worse she took her to the Paddington Green Children's Hospital where she was seen by Dr. Leslie Ogilvy. He first saw the child on the 20th April 1894, nine days after vaccination; she was then stated to be two weeks old. He noted at the time that there was a ham-coloured rash in patches, raised here and there on the face, legs, &c. He had no doubt that it was specific, and prescribed grey powder for it and mercurial inunctions. He informs me under date the 17th June, that the eruption at the angle of the mouth was very marked, and that he believes there was rash upon the hands and arms, and also that the right knee was swollen and was evidently painful when moved. He demonstrated the case as a typical case of congenital syphilis to some gentlemen who were in the room with him. In a note which he wrote with reference to this case to the Coroner on the 25th April 1894 he stated: "I saw "the child V. E. B." (a clerical error for L. E. B.) "on "Friday, April 20th, at the Paddington Green Children's "Hospital. I was of opinion that it was suffering from "congenital syphilis of a virulent type, as evidenced by "the character of the rash and the early date of its appear-"ance. I ordered the usual mercurial treatment. I have "been informed that the death has been attributed to "vaccination. The cause of death was undoubtedly con-"genital syphilis, and vaccination had nothing to do with "it. I distinctly remember the child, and called atten-"tion to the character of the rash, comparing it with two "other cases of a less severe type."

As the child did not improve, she was taken on the 22nd April to Mr. E. B., of ——, who states that she died without much change two days afterwards, and he was of opinion that the case was one of eczema, probably syphilitic; and after he became aware of the facts of the case he states that he was satisfied that the disease was congenital.

Dr. W. C. G., Physician to the —— Lying-in Hospital, who vaccinated the child, visited her on the morning of the 23rd April, the day before her death, and again the next day, the day of her death. He informs me that he found "a dull copper-coloured rash over the head and "arms; a well-defined patch over the left temple, dusky, "and with red edges; deep erosion of the left ala nasi "with snuffles; very marked nasal depression; deep "fissures round corners of mouth; deep fissures round "anus with eruption over nates and scrotum, which were "denuded of epidermis; hands and feet bright red, "swollen, without any epidermis, the parietal tuberosities "abnormally developed; no swellings over any joints; "vaccination vesicles perfectly normal; no redness or "swelling round them, indeed nothing could be healthier. "The cry of the child was hoarse and croaky."

Dr. Sweeting, of the Local Government Board, examined the child the next day, the 25th April, and found decomposition rapidly advancing. There was a blotchy dark rash all over the body, but specially marked round the anus and mouth and over and behind the ears. There were two symmetrical subcutaneous nodules on the back of the thighs, nodes on each parietal bone, as well as a profuse purulent discharge from the nose. Both he and Dr. W. C. G. were strongly of opinion that the case was one of congenital syphilis.

Two days later I was requested to inquire into the case and found the child much in the same condition, although decomposition was far advanced, and consequently I disturbed the body as little as possible, since it was in the parent's bedroom and three or more competent observers had already examined the body. There was much excoriation round the nares and lips; the remains of a dusky papular eruption on the forehead, left cheek, arms and hands; the right hand was much discoloured and there had been almost complete desquamation of the epidermis of both hands. There were four normal vaccination scars without any induration of their bases and without enlargement of axillary glands. The appearance of the child, much as it was altered by post-mortem change, suggested that it was the subject of congenital syphilis. The mother, Mrs. B., had been so distressed by the child's death, and by the number of persons who had been making inquiry as to the cause of it, that I thought it was inexpedient to suggest to her the propriety of making a post-mortem examination; and I was the more inclined to think that this would not throw much light upon the case as I did not see the child until its appearance had been very greatly altered by post-mortem change.

Family history.

Mother:—L. B., aged 22; married, pregnant only once; no miscarriages. Labour was natural, and during the time of her residence in the —— Lying-in Hospital nothing was noted which gave rise to the suspicion that she was the subject of acquired syphilis. She suckled her child almost up to the time of death, and stated that she did not suffer subsequently from any sore upon her nipples. Her previous history does not throw much light upon the case; for, although she was pregnant at the time of her marriage, she states that there is no possibility of her having contracted any disease except from her husband, and that she is absolutely certain that her present husband is the father of the child. She states that she had, so far as she knows, no sore upon the valva, no discharge, no general eruption, and no sore throat. She had some nasal discharge but only a month before her confinement, and I was unable to ascertain that she had had any definite symptom which would lead me to the conclusion that she had contracted syphilis. Physical examination on the 30th April 1894 showed that both mammæ and nipples were healthy. On the chest there were three or four indefinite papules, and one minute brownish fleck which is said to have always been there. On the neck were a few old scars said to have resulted from some affection when she was a baby; they are probably the remains of abscesses. There were a few freckles besides this on neck and upper part of thorax, but nothing else can be detected. The mucous membrane of the pharynx and mouth is healthy. On the right tonsil is one minute patch of mucous exudation. Eyes, no sign of old or recent iritis. Fundus healthy. No sign of retinitis, choroiditis neuritis or disease of vessels. On the 6th June I found on the right margin of the anus, one inch from the orifice, several irregular scars, white as compared with a darkly pigmented margin, looking as if there had been some ulceration without much loss of substance. On the left side there was a similar scar but much less marked. There are several redundant folds of skin, and Mrs. B. says that she has suffered from piles. There is no sign of ulceration, either recent or old, around the vagina and no eruption on abdomen. There were a few papules on the lower part of the thorax with very faint staining. Nothing abnormal could be detected in pharynx or eyes. She has not, and has not had, any pain in the long bones or clavicles, and I was unable to detect any sign of periostitis, old or recent; neither could I find any nodes of gummatous swellings on the trunk or extremities.

On the 4th May 1894, Dr. L., of the ——— Lying-in Hospital, writes to me that he examined Mrs. B. on the 3rd May 1894 and "found the valva healthy; labia "majora, on inner side of left labium majus a small area "of induration, the size of a split pea, circular and slightly "elevated; surface reddened; no pain or tenderness. "Labia minora and vaginal orifice healthy; vagina "healthy; no vaginitis; cervix slight left laceration; "uterus well involuted, quite movable, no pain; fornices "healthy; anus has remains of external piles: around anus "several areas of cicatrised skin, surface smooth and "glazed; around them and peripherally there is pig-"mentary staining. The skin for three quarters of an "inch round the anus on each side presents these "appearances; there is no loss of tissue; there has "evidently been some superficial ulceration about the "anus; rectum apparently healthy; perineum normal; "inguinal glands are not evidently enlarged more on one "side than the other; they can be plainly felt on both "sides, but I should not consider them to be morbidly "enlarged."

On the 7th May 1894, Dr. W. C. G. writes: "I have "examined Mrs. B. most carefully. The marks noted by "Dr. L. indicate nothing. The patch on the left side of "the anus is due to a piece of redundant skin, the

" remains of a pile pressing against the skin and keeping " it moist. The sores on the labia are due to friction " caused by wearing diaper and on account of a discharge " irritating the parts the patient has rubbed herself."

From the above examinations it will be seen that there are some appearances round the anus which in Dr. L.'s and my own opinion are probably due to some comparatively recent superficial ulceration, and although it is impossible to state with any certainty that they are so, it is possible that they are the results of condylomata. An examination of the rest of the body does not give any ground, so far as I was able to ascertain, for the suspicion that Mrs. B. is the subject of acquired syphilis.

Father :—C. B., aged 23, examined on the 29th April 1894. A feeble-looking man, undersized and of poor physique. He says that so far as he is aware he has never suffered from syphilis ; he had paraphimosis six or seven years ago, but so far as he is aware he has not suffered from any venereal affection. He cohabited with his wife about five months before marriage which took place four months before the child's birth. He has no discharge from the penis, but on the dorsum of the glans is a small reddish scar showing distinct loss of tissue, about one-eighth of an inch long, which he says he believes to have resulted from some ulceration which occurred when he was suffering from paraphimosis. There is enlargement of the femoral, axillary, and cervical glands. There are no mucous tubercles round anus. And there is no rash upon the body. The mucous membrane of the pharynx is engorged, but there are no mucous patches or ulceration upon tongue, pharynx or lips. Examination by the laryngoscope shows that both the chords are engorged, but there is neither ulceration nor cicatrization. The voice is hoarse. Eyes, pupils equal and active, no sign of old iritis. Fundus, no sign of syphilitic disease of retina or choroid. Hearing is considerably impaired ; a watch is heard only at about two inches on either side. Bones, no tenderness of long bones detected ; no periosteal swellings, nodes, gummata, or other evidence of syphilitic lesions. No tenderness of scalp. No disease detected in abdominal or thoracic viscera. Physical examination does not give any conclusive evidence that C.B. has suffered from acquired syphilis. He has suffered from venereal disease, and admits that he has been in the way of contracting it ; but there is no unmistakable evidence that he has contracted or suffered from syphilis.

Conclusion. The main questions which present themselves in this case for consideration, are :—

1. (*a.*) Was the affection from which the child L. E. B. suffered and eventually died, syphilitic ; and
   (*b.*) If it was syphilitic, was the disease inoculated at the time of vaccination or was it congenital ?
2. If the disease from which the child died was *not* syphilitic, was it directly the result of vaccination, *i.e.*, an acute general vaccinal eruption, or some exanthem determined by the constitutional disturbance following vaccination such as eczema, impetigo or general acute dermatitis ?

The evidence as to the probability of the child having inherited disease from her parents is inconclusive, for it must be noted that although the child's father had not led a moral life and had exposed himself to the liability of contracting syphilis, physical examination made by Dr. W. C. G. and myself failed to detect any unmistakable sign of the disease ; and again the mother, Mrs. B., did not at the time she was examined present any symptoms which were certainly the consequence of syphilitic infection. There are, however, two significant facts : (i.) that both father and mother have scars in positions where it is probable that they would be found in persons who had contracted some venereal affection (possibly syphilis) ; and (ii.) that although the child's face was covered with eruption and the mother cannot have suckled the child without bringing the sores about the mouth directly into contact with her nipple, she did not at the time, and has not since, suffered from any local manifestation which would lead to the supposition that she had been inoculated by the secretion from her child's sores. So far, however, as the clinical history of the parents is concerned, there is no sufficient evidence to prove that they were capable of transmitting a syphilitic inheritance to their offspring, though the presumptive evidence is strong that they might have done so.

It is a most important fact that the eruption which became so general before the child died appeared upon her face and arms between the third and sixth day after vaccination, when she was not more than twelve days old. It is, therefore, probable either that the eruption was due to some cause independent of vaccination or, if it was the direct consequence of vaccination, was a secondary vaccinal exanthem and, therefore, not syphilitic. If the eruption was syphilitic, the date at which it appeared after vaccination makes it extremely improbable that it was invaccinated, and this is still more unlikely since the vaccination pocks showed no departure from the normal, and neither became indurated nor ulcerated before the child's death ; and, further, neither of the vaccinifers in the direct line for two generations, nor the co-vaccinees of the vaccinifer or of the subject of this report, show any sign either local or general of invaccinated syphilis.

Again, the child was seen during life and carefully examined by two physicians who have special knowledge of children's disorders, while one of them has had large experience of syphilis. Both these observers had no doubt that the eruption was syphilitic, and that being syphilitic it was an evidence that the child was the subject of congenital disease ; one of the physicians demonstrated the case as a typical example of the virulent form of the congenital disorder.

On the other hand, if the eruption from which the child suffered was not syphilitic but an expression of a generalised vaccinal infection, it is remarkable that the points of inoculation showed no departure from the normal ; and, so far as I have been able to ascertain the facts, there is no evidence that vaccination at any time pursued an irregular course.

The preponderance of evidence in the case points to the conclusion that the affection from which the child L. E. B., died was syphilitic and that, being syphilitic, it was not invaccinated. At the same time a strong suspicion is raised that the eruption was an expression of inherited disease ; for, though neither father or mother show indubitable signs of local syphilitic infection, it should be noted that the father has (June 1894) a recent scar on the glans penis, and general shotty induration of the lymphatic glands. So that it is impossible to disregard the fact that the parents may have begotten syphilitic offspring.

Taking all the facts, as far as they have been obtainable, into consideration, it would seem that there is no sufficient evidence to show that the eruption from which the child L. E. B. suffered was due to vaccination and to vaccination only, while the appearance of the rash and the history of the child's parents give ground for the belief that it was due to congenital syphilis.

THEODORE DYKE ACLAND, M.D.

CASE 416, REPORTED TO THE COMMISSION BY THE LOCAL GOVERNMENT BOARD.

Case of G. H. C. W. : report to the Commission of Dr. Theodore Dyke Acland.

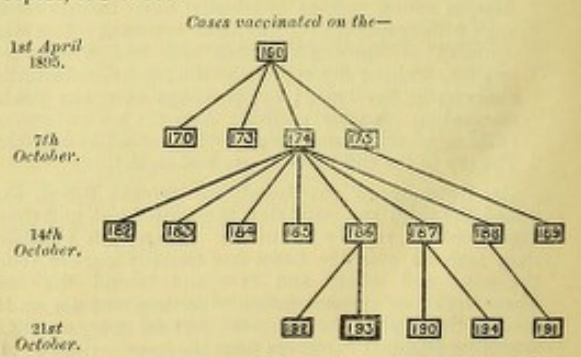
Vaccination. G. H. C. W., of ——, was vaccinated, when ten months old, by Mr. F. K. P., L.R.C.P. Edin., Public Vaccinator, on the 21st October 1895.

Death. 17th April 1896.

Certified cause. " Vaccination of syphilis."

Certified by Mr. W. H. W., M.B.

Source of lymph. The pedigree of the lymph is shown in the following diagram, the numbers in which refer to Mr. F. K. P.'s vaccination register for 1895. No. 160 was vaccinated on the 1st April 1895, and lymph was preserved in tubes for use in the autumn. G. H. C. W., the subject of this report, is No. 193.



With the exception of No. 182 in the register, whose parents have left the neighbourhood, I have examined all these children, and have not been able to trace any evidence in them of syphilis, either congenital or acquired. It did not, therefore, appear that any useful purpose would be served by extending the inquiry, since it is now (April

1896) more than a year since the child, No. 160 in the register (the original source of lymph) was vaccinated, and just six months since G. H. C. W., the subject of this inquiry, was vaccinated. So that it is practically certain that if syphilis had in any instance been inoculated some evidences of the fact would by now have declared themselves.

The following is a detailed account of the cases :—

160. R. J., No. 160 in the register, aged nine months. (Vaccinated in the direct line, three removes from G. H. C. W., the subject of this report.) A fine healthy child ; vaccination normal, and without any sequelæ ; four normal scars ; no eruption of any kind. No evidence of congenital or acquired syphilis.

From R. J., No. 160, lymph was taken on the 8th April 1895, and preserved in tubes. On the 7th October 1895, four children, Nos. 172–175, were vaccinated with this lymph.

172. D. B., No. 172 in the register, aged thirteen months. The youngest of ten children, nine of whom are alive. Vaccination was followed by some slight superficial inflammation of the arm, but the pocks had completely healed in three weeks and did not break down again. No eruption ; four normal scars. The child now (April 1896) has bronchitis, but no sign of congenital or acquired syphilis.

173. F. K., No. 173 in the register. An only child ; mother epileptic ; child has had convulsions both before and after vaccination. There was considerable inflammation and discharge from the pocks, but they were quite well in three weeks and did not break down again. No eruption ; now three normal scars ; child quite well. No evidence of congenital or acquired syphilis ; mother suckled child and did not contract any sore on her nipple.

174. E. C., No. 174 in the register, aged twelve months. (Vaccinated in the direct line, two removes from G. H. C. W., the subject of this report.) A fine, healthy-looking child, the youngest of five children all alive and well ; vaccination normal ; pocks healed within fourteen days, and did not subsequently break down ; four normal scars. Within fourteen days of vaccination the child had an irritating papular rash on the face and abdomen. She has now (April 1896) an eruption (prurigo) on the abdomen evidently caused by parasites and much altered by scratching ; it is quite unimportant.

The mother has been pregnant eight times with the following results :—

(1.) A full-time child alive and well.
(2.) „ „ „
(3.) A miscarriage.
(4.) „
(5.) A full-time child alive and well.
(6.) „ „ „
(7.) A miscarriage.
(8.) A full-time child alive and well.

I have seen all these children and none of them present any signs of congenital syphilis. The father denies ever having had any kind of venereal disease, and neither he nor his wife have any traces of old ulceration of palate, iritis, tenderness of bones or eruption, and there is no evidence to lead to the suspicion that either of them have been the subject of syphilis. The mother suckled her child after vaccination, and did not subsequently have any sore on her nipples, cutaneous eruption, or sore throat.

175. E. S., No. 175 in the register. A fine, healthy-looking baby ; vaccination normal ; no sequelæ ; no subsequent eruption ; four normal scars. No sign of congenital or acquired syphilis.

From E. C., No. 174, eight children, Nos. 182–189 ; were vaccinated on the 14th October 1895.

182. H. B., No. 182 in the register. The parents have left the neighbourhood, but I have seen the child's sister, and the midwife who attended Mrs. B., and a nephew. They all say that the child had no trouble with vaccination at any time, and that the arm healed rapidly and well.

183. W. A., No. 183 in the register, aged twelve months A splendid child ; youngest of five, all well. Vaccination normal and without complication of any kind.

184. J. C., No. 184 in the register, aged nine months. Youngest of ten children all living ; a fine, healthy child. Vaccination normal and without complication of any kind ; two normal cicatrices.

185. F. M., No. 185 in the register, aged twelve months. Youngest of five children, all alive and well. During the second week after vaccination there was considerable inflammation round the pocks, but they were quite healed in three weeks and did not subsequently break down ; no eruption then or since ; there are now (April 1896) four normal cicatrices. Since Christmas, 1895, has had whooping-cough and "inflammation of the lungs."

H. G., No. 186 in the register, aged seven months. (vaccinifer of G. H. C. W., the subject of this report). The youngest of nine children, all of whom are alive and well. Mother has had one still-born child ; no miscarriages. She is a fine, healthy-looking woman, with nothing in her appearance or history, as far as can be ascertained, to suggest that she is the subject of acquired syphilis. The father absolutely denies having suffered from any venereal disease, and is in appearance a strong, healthy-man. I was not able to see him myself, but Mr. F. K. P. saw him, for the purposes of this inquiry, on the day subsequent to my visit. The child H. G. is a sturdy, well-nourished, healthy-looking child, showing some signs of rickets, but no sign whatever of syphilis, congenital or acquired. On the face are a few spots of lichen urticatus. Vaccination pursued a normal course without any complication, and there are now (April 1896) four normal cicatrices. *No. 186, the vaccinifer of G. H. C. W., the subject of report.*

A. J., No. 187 in the register, aged twelve months. A fine, healthy-looking child. Vaccination was normal without any complication ; pocks healed quickly and did not break down again. There are now (April 1896) four normal cicatrices ; the child has a few spots of lichen urticatus at the back of neck, which are very irritable. She has no sign of syphilis, congenital or acquired. *No. 187.*

W. B., No. 188 in the register, aged nineteen months. Youngest of seven children, six of whom are alive, and four of whom I saw ; all of them appear to be in good health. There was some slight inflammation round the pocks after vaccination, but no other complication, and there are now (April 1896) four cicatrices. The child shows no sign of syphilis, congenital or acquired. *No. 188.*

E. E., No. 189 in the register. Three of the vaccination insertions failed, but the wounds did not break, down or give any trouble. They seem merely to have aborted ; there is now (April 1896) one small ill-defined cicatrix. The child is well and shows no signs of syphilis, congenital or acquired. *No. 189.*

On the 21st October 1895, five children, Nos. 190–194, were vaccinated. Two of the children, Nos. 190 and 194, were vaccinated from A. J., No. 187 ; one, No. 191, from W. B., No. 188 ; and the remaining two, Nos. 192 and 193 (the latter being the child G. H. C. W., the subject of this report), from H. G., No. 186.

From A. J., No. 187, there were vaccinated :—

T. D., No. 190 in the register, aged eleven months. The youngest of two children ; vaccination normal without complication of any kind ; pocks healed well and quickly ; vaccination was not followed by any eruption on the body, and there are now (April 1896) four healthy cicatrices. The child appears healthy, large, and well nourished, has no eruption on his body, and shows no sign of syphilis, congenital or acquired. There is some impetigo round his nose. *No. 190.*

J. R., No. 194 in the register. A fine, healthy-looking child, in whom vaccination pursued a normal course without any complication. There are now (April 1896) four healthy scars. No lymph was taken from the arm. *No. 194.*

From W. B., No. 188, there was vaccinated :—

L. P., No. 191 in the register, aged twelve months. The youngest of two children ; after vaccination there was some slight inflammation round the pocks, but it gave no trouble and was not followed by any eruption. The child now (April 1896) appears, and is said to be quite well. She has a clear complexion, firm muscles, and the nutrition is good. There is some slight excoriation about the nates ; no ulceration or desquamation round anus ; the excoriation is, no doubt, caused by lack of cleanliness. The child was dirty, and not properly cared for when inspected, but shows no sign of syphilis, congenital or acquired. *No. 191.*

From H. G., No. 186, there were vaccinated :—

W. G., No. 192 in the register, aged twelve months. (The co-vaccinee of the child G. H. C. W., the subject of this report.) The youngest of eleven children, nine of whom are alive, and five of whom I saw. The child is well nourished, without eruption of any kind, and with four typical cicatrices. He does not show any sign of syphilis. The two *No. 192, the co-vaccinee of G. H. C. W., the subject of report.*

eldest children, although well nourished, have strumous teeth and do not look very strong, but their mother assures me that their health is good, and they do not show any sign of congenital syphilis.

No. 193. G. H. C. W., No. 193 in the register, the subject of this report.

G. H. C. W., the subject of report. Course of vaccination and illness. G. H. C. W. was vaccinated, when about ten months old, on the 21st October 1895. He was then teething and had a "cold." He was pale, and not a strong child. The arm was inspected on the 28th October, and is believed to have been normal. Considerable doubt is thrown upon the subsequent history by the fact that the statements made by the father and mother are contradictory and are not made in a manner which gave confidence as to their accuracy, but as far as I was able to ascertain from them the arm became inflamed about the end of the second week after vaccination and they treated it themselves until some time towards the middle of November, when the child was shown to Mr. F. K. P., the vaccinator. The arm was then inflamed, and he advised that the child should be taken to Dr. W. H. W. The earliest date upon which I can find any record of the child's having been taken to Dr. W. H. W. is the 25th November. On that day there is an entry in Dr. W. H. W.'s ledger making a charge for seeing him and giving an ointment. The child was first seen at Dr. W. H. W.'s surgery by Mr. E., his assistant, who tells me that when he first saw the child he was shrivelled looking, and looked like a child suffering from congenital syphilis. Mr. E. says that all the points of insertion were then ulcerating, the ulcers being punched out with clean-cut edges and a smooth base covered with discharge. He assures me that he is quite certain as to the excavated appearance of the ulcers and as to there being a considerable amount of discharge. Although the appearance of the sores suggested to him that they were possibly syphilitic, he did not examine them for induration. He says that he is sure that when he first saw the child it had no rash upon its body. (The statement about the rash is quite contrary to that which is made by the father and mother, who say that the child had a bright red eruption on the lower part of its abdomen and in the groins.) Mr. E. kept the child for Dr. W. H. W. to see, and he confirms Mr. E.'s statement about the appearance of the ulcers, and adds that there was a considerable amount of inflammation of the axillary glands and of the arm, and that there was induration round the wounds. Dr. W. H. W. sent the child on to ——— Hospital, where it was believed to have been seen by Mr. S., then House Surgeon, but no entry is made in the casualty book as to its having been there or been treated. The case was reported to the surgeon of the week who was then operating, and he requested that it might be brought back on the next day and treated in the ordinary way as an out-patient. The mother took the child back to Dr. W. H. W., who then treated it, and she did not go to the hospital again. It appears certain that the child was seen by Dr. W. H. W. or his assistant on more than one occasion, but there is no record of its having been so seen subsequently, except on the 1st December, and no note has been kept as to its condition; the only certain thing which I can ascertain about it is that it was treated internally with mercury and with inunction of mercurial ointment, that the inunction was done upon the abdomen until the child's skin desquamated, and then for a few days zinc ointment was substituted for the previous application. The vaccination wounds appear to have healed up within two or three weeks of its first coming under Dr. W. H. W.'s treatment, and both he and Mr. E. are of opinion that the child did not suffer from any eruption except this rash on the lower part of its abdomen, or from any other manifestation of secondary syphilis. The child continued to waste and had various symptoms of disordered digestion. The cough and the malnutrition became progressively worse, until the child died on the 17th April 1896. Dr. W. H. W., believing that the sores at the point of vaccination were manifestations of primary syphilis, signed the certificate of death in accordance with this opinion, without making any inquiries as to the probability of the child having in fact been inoculated with the syphilitic virus.

Treatment of vesicles. Before the child was taken to the doctor and when the arm first began to inflame, the mother applied cream to the vesicles and covered them with a rag. She herself came to the conclusion that the application was producing irritation of the vesicles and desisted from it. No other treatment, as far as I can ascertain, was adopted.

Method of vaccination. Mr. F. K. P.'s procedure in vaccination, as far as I can ascertain, is careful and cleanly. His instruments are used for no other purpose. He has not himself suffered from syphilis, and neither he nor his assistant are aware that they have been in contact with any case from which it is possible they might have conveyed syphilitic virus by their hands. His register seems to be accurately and carefully kept.

Previous history. The child appears to have been feeble from birth, and after the first two or three months it was entirely hand-fed. It suffered from bronchitis in the spring and again in the autumn within a fortnight of its being vaccinated. In the spring vaccination was postponed in consequence of its condition, and Mr. F. K. P. was not informed that it had been in feeble health when the child was vaccinated in October.

Family history. Both father and mother are much below the average in physical development. The mother is a feeble, ill-educated, untidy person; the father much the same, and when first seen was considerably the worse for drink. During the greater part of the child's early life the father was out of work, and both he and his wife seem to have been but little removed from actual want. I was not able to elicit anything by indirect questions from the mother which would lead me to suspect that she was suffering from acquired syphilis. She has been twice pregnant, and both pregnancies have resulted in full-time children. She has had no miscarriages. The father absolutely denies having had any venereal disease, though he admits having been "gay in his time." The only child living is fairly well nourished, with a good complexion, anæmic, but not presenting any evidence of inherited syphilis.

General surroundings. The cottage in which the child G. H. C. W. lived is one of a type frequently found in the country, and I was unable to discover anything, except the dirt of the place, which would have been likely to cause infection of the vaccination wounds. There was ample opportunity, both from the condition of the house and the general lack of cleanliness evident in both father and mother, for the production of conditions which would set up inflammation in any open wound.

Summary. The diagnosis in this case was made by Dr. W. H. W., who signed the death certificate, entirely from the appearance of the vaccination wounds when he first saw the child on the 25th November, five weeks after vaccination, and nearly five months before death. He made no inquiry as to vaccinifer or family history, and from the nature of the sores as described by him, it would seem that they presented the appearance of vaccinal ulcers rather than that of primary syphilitic sores. On reference to the first of the two following tables it will be seen that there were great and important differences between the ulcers when first seen by Dr. W. H. W. and those usually found at the points of inoculation of invaccinated syphilis, and seeing that the child did not subsequently present any definite symptom of inoculated syphilis, there are many obvious sources of fallacy in drawing any deduction solely from the appearance of the sores.

Table 1.

Character of the ulcers in the case of G. H. C. W. compared with those of typical vaccinal syphilis.

G. H. C. W.	*Vaccinal Syphilis (Fournier).*
All the points of vaccination equally affected. Up to time of inspection, vaccination was normal.	One or more of the points of insertion are affected as a rule. Vaccination often abortive.
Type of lesion markedly inflammatory.	Type of lesion generally non-inflammatory.
No scabs found until the ulcers were healing. Ulcers deep, excavated, with much surrounding inflammation, and a considerable amount of purulent discharge.	Scabs nearly always form, and if there is more than simple excoriation there is little excavation.
Margin of ulcers clean cut, not sloping to base.	Margin of ulcer sloping generally to base.
Base of ulcers hard, possibly the result (as frequently happens in vaccinal ulceration) of the foregoing inflammation.	Base of ulcer hard, parchment-like.
Child cachectic when first seen five weeks after vaccination looking, according to Mr. E., like a child suffering from *congenital* syphilis.	Five weeks after inoculation primary stage only reached. Syphilitic cachexia hardly possible at this period (T. D. A.).

Table 2.

Symptoms in the case of G. H. C. W. compared with those typical of vaccinal syphilis. (See second table given in my report on Case 207, page 397.)

G. H. C. W.	*Vaccinal Syphilis.*
Suppurating ulcers at the point of each insertion. Acutely inflamed glands subsiding quickly as soon as ulcers healed. Evolution irregular; ulcer formed before 14th day. Some surrounding induration at end of 5th week after arm had been much inflamed; child cachectic-looking during 5th week after vaccination.	An initial chancre at point of inoculation invariable. Indolent bubo the rule. Duration of both the above often prolonged without specific treatment. Evolution regular. No manifestation of general infection before sixth week (Cf. page 397, Case 207, Table 2).
Rash erythematous only, appearing not later than end of second week.	Rash polymorphic, generally papular or squamous; often roseolous, certainly not appearing earlier than the sixth week after inoculation.
Some rash and excoriation round lower part of abdomen and groins which followed the inunction of mercurial ointment. No mucous tubercles noted.	Rash and excoriation round nates not common. Mucous tubercles commonly present.

To give reasonable ground for the supposition that the sores were, in fact, syphilitic, though they did not present the typical appearances of a primary chancre, it would be necessary that the child should show some other manifestation of syphilis or that there was some possible source of contagion either in the lymph or in some person with whom the child had been brought into contact. It has been shown in the preceding report, that, as far as can be ascertained, not one of the children vaccinated in the direct line for four generations (the vaccinations extending over a period of six months, the first having been done more than twelve, and the last five months ago), or any of their co-vaccinees shows any evidence of inoculated or inherited syphilis, and it has also been shown that whereas all the pocks in the case of G. H. C. W. (No. 193) ulcerated, not one of the vaccinations performed on the other children on the same day showed any departure from normal. So that, as far as the facts can be ascertained, the only legitimate deduction that can be made is that if the sores on G. H. C. W.'s arm were syphilitic, the virus was derived from some source other than the lymph or one of the children vaccinated on the same day. I have been unable to ascertain that the child had been in contact with any person capable of communicating syphilis, and even if he had been it is in the highest degree improbable that all the vaccination pocks would have been equally affected.

It may be convenient to give here a summary of the evidence for and against the view that the child G. H. C. W. died of invaccinated syphilis.

That on Wednesday, the 25th November, five weeks after vaccination, the case was seen by Dr. W. H. W. and his assistant, Mr. E., and the sores on the arm, which they described as excavated, clean cut, with some discharge and much inflammation of glands, were believed by them to be primary syphilitic sores:—

(1.) That the sores commenced to form, according to the positive statement of the child's father and mother, during the week after inspection.

(2.) That there was much inflammation both of arm and of axillary glands.

(3.) That there was a considerable amount of discharge from the ulcers.

(4.) That, when first seen by Dr. W. H. W., they were deep, punched out, not scabbed over.

(5.) That there was no true secondary eruption of any kind noted by the parents or Dr. W. H. W.

(6.) That all four vaccination wounds were equally affected.

(7.) That the erythematous rash which appeared on the abdomen appeared certainly earlier than four weeks after vaccination.

(8.) That the desquamation certainly followed the inunction of mercurial ointment, which was stopped in consequence by Mr. E.

(9.) That when seen five weeks after vaccination, the child, according to Mr. E., was withered and ill, and looked like a child with congenital syphilis.

(10.) That the vaccinifer is the youngest of nine children, eight of whom are alive and show no signs of syphilis.

(11.) That in the other child vaccinated from the same source, vaccination pursued a normal course and was not followed by any sign of inoculated syphilis.

(12.) That none of the children vaccinated on the same day show any sign of syphilis, congenital or acquired.

(13.) That none of the children vaccinated from the same source as the vaccinifer (six in number) show any sign of syphilis, congenital or acquired.

(14.) That neither the vaccinator or his assistant is suffering from syphilis or, so far as he is aware, has been so in contact with a syphilitic person as to make it probable that he could be an intermediary in conveying it.

(15.) That the vaccination instruments had been properly cleaned and not used for anything but vaccination.

Taking all the facts, as far as it has been possible to ascertain them, into consideration, I am of opinion that there is no sufficient evidence to show that the child G. H. C. W. suffered from syphilis at all. He was a feeble child, the offspring of unhealthy parents who had rarely the necessaries of life. The child was hand fed, and had suffered from bronchitis in the spring, in consequence of which vaccination had once to be postponed. In the autumn the child suffered again from bronchitis; after vaccination it had considerable inflammation of the arm, doubtless aggravated by the treatment adopted, and there was ulceration of the vaccination wounds. It seems probable that all these circumstances combined to produce those disturbances of nutrition from which it ultimately succumbed.

From the history it is quite possible that the child eventually died of tuberculosis, but no post-mortem examination was made.

THEODORE DYKE ACLAND, M.D.

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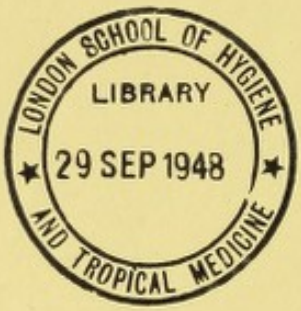
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