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REPORT

ON THE

HEALTH OF THE CITY

OF

BIRMINGHAM,

FOR THE YEAR **1900,**

ALSO,

ON THE PROCEEDINGS TAKEN UNDER THE ACTS FOR THE

PREVENTION OF ADULTERATION

OF FOOD AND DRUGS.

BY

ALFRED HILL, M.D., F.R.S.E., F.I.C.,

Past-President of the Society of Medical Officers of Health; Past-President of the Society of Public Analysts; Late Examiner in Public Health to the University of Aberdeen; Fellow of the Sanitary Institute; Fellow of the College of State Medicine; Fellow of the Incorporated Society of Medical Officers of Health;

MEDICAL OFFICER OF HEALTH AND ANALYST TO THE CITY.

PRINTED BY ORDER OF THE HEALTH COMMITTEE

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With the Medical Officer of Health's

Compliments.

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HEALTH DEPARTMENT,

THE COUNCIL HOUSE,

BIRMINGHAM,

March 26th, 1901.

TO THE HEALTH COMMITTEE.

MR. CHAIRMAN AND GENTLEMEN,

I beg to present to you for the year 1900 my 28th Annual Report as Medical Officer of Health for the City. Introductory Remarks.

The total death-rate for the year was unfortunately rather high, owing principally to the heavy mortality in the first half of the year from influenza, bronchitis and pneumonia. This heavy mortality was far more severe in the small badly lighted and insufficiently ventilated homes of the poor than elsewhere.

The year was marked by an unusually large number of deaths from whooping cough, and an extensive prevalence of typhoid fever. A most welcome reduction took place, however, in the cases of diphtheria, and the fatality of the disease was also very low, owing partly, I believe, to the use of anti-toxic serum in many cases. It is also pleasing to me to be able to show that the special efforts made during the last three years to reduce the mortality from epidemic diarrhœa have met with a considerable amount of success.

I am still of opinion that, while many of the older houses in the town are scarcely fit for habitation, it is undesirable to close any large number of them until new houses suitable to the requirements of the labouring classes have been erected. The erection of such dwellings should, I consider, be carried out on a number of unoccupied sites within easy reach of the centre of the City.

The work of converting ashpit privies into water closets is still progressing at a fairly rapid rate, but only a small number of pan privies have at present been displaced.

POPULATION.

Population.

Estimated in the ordinary way, the population of the City at the middle of the year 1900 would be 519,610. Judging, however, by the number of occupied houses—which the various Overseers have again, with their usual courtesy, obtained for me—it would seem probable that the actual population at the present time is in excess of this estimate. Unfortunately, there is no possibility of knowing what the exact population is until another census has been taken, and in the meantime I think it best to use the Registrar-General's estimate for the purpose of calculating the birth-rate and death-rate. Any error in the population would of course cause the birth-rate and the death-rate to be incorrectly stated, and we are, unfortunately, in the position of not knowing with certainty what is now the true death-rate of the City, owing to the long interval which is allowed to elapse between the censuses.

I am heartily in favour of the institution of a quinquennial census, as under the decennial enumeration large errors frequently arise in the estimated population between one census and the next. For instance, in Birmingham in 1891 the estimated population was found to be about 40,000 in excess of the actual population; while at the present time there is reason to suppose that the estimated populations of many towns are seriously above or below the truth. Errors like these would be greatly reduced if a quinquennial census were taken.

MARRIAGES.

Marriage-rate

From 1896 to 1899 the marriage-rate showed a very substantial increase on what it had been during the four previous years. Last year, however, there was a considerable reduction, although even now the rate is higher than it was from 1892 to 1895. The number of marriages in 1900 was 4,904, and the marriage-rate was 18·9 per 1,000 of the population.

	Marriage-rate per 1,000.
1892	17·9
1893	16·9
1894	17·3
1895	17·9
1896	20·0
1897	21·9
1898	20·9
1899	20·8
1900	18·9

BIRTHS.

Birth-rate.

The birth-rate, which had risen continuously from 31·6 in 1894 to 34·3 in 1899, showed a decided retrogression last year, being only 32·7 per 1,000.

In the first quarter the birth-rate was 0·8 in excess of the quinquennial average. In the second quarter it was 0·3 in excess. Then the fall commenced, the rate for the third quarter being, however, only 0·5 below the average, while that of the fourth quarter was as much as 2·9 below it, a result largely due in all probability to the war in South Africa.

DEATHS.

Death-rate.

The deaths recorded during 1900—corrected as far as possible by excluding the deaths of non-residents which occurred in the City, and adding the deaths of Birmingham citizens which occurred beyond its boundary—amounted to 10,882, equal to a death-rate of 21·0 per 1000 of the estimated population. The death-rates for the last ten years have been as follows:—

	Death-rate per 1,000.
1891	21·1
1892	20·0
1893	21·5
1894	18·2
1895	19·9
1896	20·4
1897	21·1
1898	19·5
1899	20·5
1900	21·0

A death-rate of 21·0 per 1,000 is not a good one. During the previous twenty years the death-rate was below 21 in fourteen and above 21 in six instances.

Death-rates in great Towns.

Not only was last year's death-rate above the average for Birmingham, but it was also in excess of those recorded in many other towns. Of the thirty-three great towns mentioned in the Registrar-General's Annual Summary only six had a death-rate as high as Birmingham. Among the ten largest towns in England, with which our City is more fairly comparable, Birmingham stood seventh, the three towns which had higher death-rates being Liverpool, Manchester, and Sheffield.

Mortality from prominent diseases.

It will be desirable first of all to point out what causes of death were mainly responsible for the somewhat high death-rate. They can be readily seen from the following statement :—

	Deaths in 1900.	Average 1895-1899.	Increase or Decrease.
Measles	130	247	- 117
Whooping Cough ...	301	242	+ 59
Typhoid Fever ...	179	102	+ 77
Diarrhœa	613	723	- 110
Enteritis	409	447	- 38
Influenza	185	92	+ 93
Cancer	368	356	+ 12
Tubercular Diseases ...	1,078	985	+ 93
Premature Birth ...	353	385	- 32
Old Age	564	486	+ 78
Nervous Diseases ..	973	967	+ 6
Heart Disease ...	693	637	+ 56
Bronchitis, Pneumonia, and Pleurisy ...	2,227	1,787	+ 440
Diseases of Digestive System	546	493	+ 53
Diseases of Urinary System	265	230	+ 35
Debility and Wasting	708	642	+ 66

The above is a list of those diseases which caused upwards of 100 deaths. Although several other causes of death were implicated to a certain extent, it is quite clear that the increase in mortality was chiefly due to the unusually large number of deaths from the principal respiratory diseases—bronchitis, pneumonia and pleurisy.

Mortality from respiratory diseases.

On examining the records for various parts of the year, it can be seen that the excessive death-rate from respiratory diseases was confined to the first and second quarters. It appears to have been due partly to an outbreak of influenza and partly to severe atmospheric conditions.

Respiratory diseases in Wards.

In order to discover whether the high mortality from bronchitis, pneumonia and pleurisy affected all parts of the town to an equal extent, I have calculated the death-rates for the various wards during the first half of the year. They are as follows :—

Ward.	Death-rate from Bronchitis, Pneumonia and Pleurisy.
St. Bartholomew's	9·4
St. Stephen's	7·6
Duddeston	7·6
St. Mary's	6·7
Deritend	6·4
St. Thomas'	6·2
St. George's	6·0
St. Paul's	5·7
Nechells	5·3
St. Martin's	4·7
Bordesley	4·6
Market Hall	4·5
Saltley	4·4
Ladywood	4·2
All Saints'	3·9
Rotton Park	3·5
Balsall Heath	3·5
Edgbaston and Harborne	3·2

A glance at the above figures shows that the incidence of fatal cases of bronchitis, pneumonia, and pleurisy varied greatly, the worst ward having three times as many deaths as the best. It will be noticed, too, that the wards occupied by the poorer classes suffered most. This is not surprising, for respiratory diseases are largely dependent on atmospheric conditions, and the poor in such a ward as St. Bartholomew's are certainly not so well protected against the weather, either at home or out of doors, as are the occupants of Edgbaston and Harborne Ward.

Respiratory diseases in St. Bartholomew's Ward.

It will be seen that the Ward which suffered most of all from respiratory diseases was St. Bartholomew's. But it must not be supposed that all parts of St. Bartholomew's Ward had an equally high mortality from this cause. In order to locate more exactly the excessive number of deaths from bronchitis, pneumonia, and pleurisy in St. Bartholomew's Ward, I have ascertained the number in each street, and calculated the mortality in groups of streets selected according to the proportion of houses let at about 3/6 per week. The figures obtained in this way are as follows :—

	Death-rate from Bronchitis, Pneumonia and Pleurisy.
19 streets with no houses at 3/6	4·9 per 1,000
25 ,, ,, 0–25 % ,, ...	6·3 ,,
30 ,, ,, 25–50 % ,, ...	13·7 ,,
15 ,, ,, over 50 % ,, ...	8·5 ,,

It is now quite clear that (1) St. Bartholomew's Ward suffered more than other wards from respiratory diseases, and (2) that the highest mortality in that ward was in those parts in which there are a considerable number of low-rented houses. The above death-rates are, however, open to some objection on the ground that they apply to small populations only, and it may be well to extend the enquiry into the incidence of respiratory diseases so as to embrace the whole town. When this is done the disparity between the streets with twenty-five to fifty per cent. of small houses and the streets with over fifty per cent. becomes much less marked.

Respiratory diseases in the whole City in low-rented houses.

Thus dividing the whole of the streets in the city into five groups, according to the proportion of houses in them let at about 3/6 per week, I have calculated the respiratory death-rate for each group, and find it to be as follows :—

	Death-rate from Bronchitis, Pneumonia and Pleurisy.
Streets with no houses at 3/6	3·61
,, ,, 0–25 % ,, ,, ...	4·97
,, ,, 25–50 % ,, ,, ...	8·35
,, over 50 % ,, ,, ...	7·10

These death-rates bear out the general conclusion derived from a study of the figures for St. Bartholomew's Ward, viz., that the excessive mortality from respiratory diseases occurs in the houses occupied by the poor who cannot afford to pay more than a small rent. I need hardly say that more correct results are obtained from extensive observations than from limited ones, and that therefore the figures for the whole town are more valuable than those for a single ward.

It may perhaps be thought that a high mortality is the natural concomitant of poverty, and that it is inevitable that the homes of the poor should be thus associated with a heavy death-rate not only from respiratory diseases, but from most other causes too. There is, however, a great deal of evidence that this is not the case. The Peabody Trust, for instance, finds accommodation in London for 19,201 persons, consisting chiefly of labourers, porters, carmen, charwomen, needlewomen, and their families. A recent report issued by the Trustees states that the average amount earned by the heads of the families occupying their houses was only £1 3s. 1d. per week, and yet the death-rate during 1900 was as low as 16·4 per 1,000. This fact certainly indicates that even the very poor may possess good health and be subject to a low death-rate if they live in sanitary dwellings and lead respectable lives.

Death-rates in Wards.

Turning now to the total death-rates in the various wards, I find them to be as follows :—

Ward.	Estimated population.	Death-rate per 1,000.
St. Mary's	16,100	29·5
St. Bartholomew's	27,100	27·7
St. Stephen's	24,300	25·3
Deritend	26,100	24·7
St. George's...	21,900	24·6
Duddeston	25,300	22·5
Nechells	35,000	21·1
St. Martin's...	25,800	20·4
St. Paul's	17,200	20·1
St. Thomas' ...	20,000	20·0
Market Hall	12,400	18·9
Ladywood	26,800	18·1
All Saints'	46,100	18·0
Rotton Park	46,900	16·5
Saltley	41,600	16·4
Bordesley	57,100	14·9
Balsall Heath	42,100	14·7
Edgbaston and Harborne...	32,500	13·6

It will be seen that six wards had death-rates considerably in excess of that of the City as a whole. In St. Mary's Ward the excess was 8·5 per 1,000; in St. Bartholomew's Ward 6·7; in St. Stephen's 4·3; in Deritend

3·7 ; in St. George's 3·6 ; and in Duddeston 1·5. If these six wards had only been as healthy as the City as a whole, no less than 635 lives would have been saved in them last year. If they had been as healthy as Edgbaston and Harborne Ward, the lives saved in them last year would have numbered no less than 1,677.

It will be apparent to everyone that a death-rate like that of St. Mary's Ward is capable of enormous reduction ; it must also be assumed that a death-rate such as is recorded in Edgbaston and Harborne Ward cannot possibly be reduced to the same extent. It is, therefore, scarcely necessary for me to point out that the most effective way of reducing the death-rate of the City as a whole will be by taking special steps for improving the healthiness of the wards which at present have excessively high death-rates.

Crowded houses and high death-rates.

One of the most marked differences between the unhealthy and the healthy wards is that the houses are crowded together to a much greater extent in the former than in the latter. I have no doubt whatever that this circumstance is one great cause of the difference in their death-rates. Wherever houses are not sufficiently exposed to fresh air and sunlight they are certain to be unhealthy, and all the facts in my possession, whether relating to Birmingham itself or to other great towns, point to the conclusion that the amount of open space in contiguity with the houses is one of the chief factors in determining whether a district shall be healthy or the reverse.

In support of this assertion, I may point out that in the healthy wards in Birmingham there are scarcely any houses with less than 20 feet of open space in front of them ; in all the unhealthy wards the number of such houses is large. Moreover, in the healthy wards the majority of the houses have back windows and doors, so that air and light have fuller access to them ; in the unhealthy wards the exact opposite is the case, the majority of the houses receiving light and air at the front only.

The evidence on this point afforded by other large towns is equally striking. Of recent years three of the great towns have been made conspicuous by the very low death-rates recorded in them, viz., Cardiff, West Ham, and Bristol. Their populations and death-rates during 1900 are shown below :—

	Population.	Death-rate.
Cardiff	194,247	13·8
West Ham	314,472	15·9
Bristol	324,973	16·7

I have communicated with the Medical Officers of Health of these three towns upon the question of open space around houses, and find that in Cardiff there are less than 100 houses with no open space at the back and no through ventilation; in West Ham there are only 20; and in Bristol about 900. In contrast with these figures we have in Birmingham nearly 40,000 such houses. I have no hesitation whatever in attributing the remarkable healthiness of Cardiff, West Ham, and Bristol primarily to the circumstance that there are in these three towns scarcely any houses which are very deficient in light and ventilation owing to the absence of sufficient open space around them.

In view of these and many other similar facts, I feel I must reiterate the opinion expressed in previous reports, that it is useless to look for any great diminution in the death-rate of Birmingham until among other measures more provision has been made for light and ventilation in its crowded courts.

Pan Privies and high death-rates.

Another great difference between the healthy and unhealthy wards is in the kind of privy accommodation provided. Here again experience both in Birmingham and in other towns shows that water-closets are usually associated with a low death-rate, and pan and ashpit privies with a high one. From a practical acquaintance with the actual privies, and from a study of the mortality in districts where they are common, I am convinced that the pan and ashpit privies will have to be replaced by water-closets if the unhealthy wards are to have their death-rates substantially lowered.

Bad habits and high death-rates.

Apart from the sanitary condition of the property, a great deal of the ill-health in many parts of the town is due to the insanitary habits of the people. It is with a view to altering this condition of things that your Committee has appointed Women Health Visitors to work amongst the poorer classes, and there can be no doubt that their work will eventually effect a great improvement in the habits and consequently in the health of the people who live in the unhealthy districts.

Infant Mortality.

Infantile death-rate.

I regret to say that the infantile death-rate was one of the highest in my records, the rates for the past ten years having been as follows:—

	Deaths under 1 year per 1,000 Births.
1891	165
1892	166
1893	198
1894	164
1895	182
1896	197
1897	214
1898	190
1899	193
1900	199

The principal headings under which the infantile mortality occurred are as follows :—

Whooping Cough	129	deaths.
Diarrhœa	475	,,
Enteritis	331	,,
Tubercular Diseases	114	,,
Premature Birth	353	,,
Convulsions	178	,,
Bronchitis, Pneumonia, and Pleurisy	500	,,
Debility and Wasting	670	,,

It will be noticed that most of the diseases which cause a large number of infantile deaths are of a preventable kind, resulting chiefly from bad feeding, exposure to cold, and other avoidable conditions.

INFECTIOUS DISEASES.

Zymotic death-rate.

The zymotic death-rate for the year was 2·7 per 1,000. This death-rate is based upon the number of deaths from the seven principal zymotic diseases—viz., smallpox, measles, scarlet fever, diphtheria, whooping cough, fever (typhus, typhoid, and simple continued), and diarrhœa. Unfortunately, the value of this death-rate for comparative purposes has greatly depreciated, owing to the use in recent years of the term enteritis to denote the complaint which in former years was almost always designated diarrhœa. Thus there is reason for thinking that at least 200 deaths were last year attributed to enteritis which would have been set down to diarrhœa ten years ago. As enteritis is not counted as a zymotic disease, but as a local disease of the digestive organs, it follows that the "mortality from the seven principal zymotic diseases" does not now embrace the whole of the deaths which were once covered by it.

Diarrhœa and its synonyms.

It is a great pity that the mortality from so important a disease as diarrhœa should be rendered ambiguous by the use of an unauthorised synonym, and I am glad that the Royal College of Physicians has taken steps to obviate

this ambiguity. The College realises that certain medical men object to use the term diarrhœa as a cause of death, and to meet this objection has decided to authorise the use of the terms "epidemic enteritis" and "zymotic enteritis," as synonymous with epidemic diarrhœa, and to urge medical practitioners to refrain from using the terms "muco-enteritis," "gastro-enteritis," or "gastric catarrh" as synonymous for that complaint.

I recently forwarded to every medical practitioner in Birmingham a copy of a circular drawn up by the Incorporated Society of Medical Officers of Health, calling attention to this decision of the Royal College of Physicians, and I trust that in future all deaths due to epidemic diarrhœa will be certified under that heading, or under its authorised synonyms, "epidemic enteritis" or "zymotic enteritis." If this is done, the zymotic death-rate will again be comparable with that recorded some years ago.

Deaths from zymotic diseases

The subjoined statement shows the mortality from the principal zymotic diseases, and also from enteritis :—

	Deaths in 1900.	Average 1895-99.	Increase or Decrease.
Smallpox	0	2	- 2
Measles	130	247	- 117
Scarlet Fever	93	92	+ 1
Diphtheria and Croup	77	189	- 112
Whooping Cough ...	301	242	+ 59
Typhoid Fever ...	179	102	+ 77
Diarrhœa	613	723	- 110
Enteritis	409	447	- 38

Measles, diphtheria, and diarrhœa showed a greatly decreased mortality, but unfortunately whooping cough and typhoid fever showed a marked excess over the average number of deaths.

SMALLPOX.

Smallpox.

During the year two cases were notified to me as smallpox. They occurred in a family living at Edgbaston, and were thought to have resulted from a visit to India, smallpox having broken out on the vessel in which the homeward journey was made. The patients were isolated at their own home, and no spread of the disease occurred.

VACCINATION.

Vaccination.

The returns made by the vaccination officers show that in the year which ended on June 30th, 1900, the births of 17,472 children were reported to them. Of these, 2,588 died before vaccination had been performed, leaving 14,884 children to be accounted for.

Of these 14,884 children 11,671, or 78·4 per cent. had been successfully vaccinated at the time the return was made. "Conscientious objection" to vaccination was made in 77 instances out of 17,472 children born, or only about 0·4 per cent. It appears, indeed, that the "conscientious objector" is rarely discovered in Birmingham, and last year he was even less in evidence than in the previous year.

Less than 10 per cent. of the children appear to have escaped the vigilance of the vaccination officers, while at the time of making the return nearly 11 per cent. remained unvaccinated, but were still under their notice.

Measles.

Measles.

The mortality from measles was unsually light, only 130 deaths being set down to this cause, against an average of 247 in the previous five years. Since 1891 there have been no less than 2,176 deaths from measles, distributed over the individual years as follows:—

	Deaths from Measles.
1891	107
1892	340
1893	48
1894	316
1895	133
1896	310
1897	414
1898	182
1899	196
1900	130

In spite of the heavy death-roll from measles, the disease is very lightly regarded in many quarters, and no care is taken to separate the sick children from the healthy.

The officers of the School Board continue to send me the addresses of children who are absent from school on account of this disease, and I forward a handbill to each family affected, pointing out the precautions which should be taken to prevent the spread of infection and to save the patient from getting a chill and dangerous complications.

Scarlet Fever.

Scarlet Fever.

The scarlet fever cases, although more numerous than in 1897, 1898, or 1899, were still a little below the average number in the five years 1895-99. They amounted to 2,063, while the average number for the period mentioned was 2,171.

The deaths from scarlet fever numbered 93, against an average of 92 in the previous five years.

During the registration year, which does not quite correspond with the calendar year, 1,814 cases of scarlet fever were removed to the City Hospital, being about 88 per cent. of the total number of cases notified. This is a large proportion.

Scarlet Fever and hospital isolation.

You are probably aware that some doubt has recently been cast upon the efficiency of isolation hospitals in reducing either the prevalence or the fatality of scarlet fever. I think it may be well, therefore, to state what the experience of Birmingham has been in this matter.

Unfortunately the compulsory notification of scarlet fever only dates back to 1890, and I have no means of determining the exact prevalence of the disease during the early years of my official life, when removal to hospital was the exception rather than the rule. I cannot, therefore, bring forward any figures which will prove conclusively that the more extensive isolation of scarlet fever cases has produced a diminution in the total number of cases, although I certainly think there are marked indications that such has been the result.

Among the strongest of such indications is the fact that the death-rate from scarlet fever has fallen to a far greater extent than can be accounted for by the decreased virulence of the attacks ; this fact makes it almost certain that the number of cases has greatly diminished. Moreover, in 1878, when isolation in hospitals was but little resorted to, there were no less than 995 deaths from scarlet fever. In the City Hospital, General Hospital, and Children's Hospital 697 cases were treated during that year, and resulted in 107 deaths, or about one death to six cases. If this proportion held good in relation to the whole of the 995 deaths there must have been about 6,000 cases in the City in 1878. Since hospital isolation has been extensively practised there has been no epidemic to compare with this in magnitude, the largest number of cases in any one year being a little over 3,000.

With regard to the other point—the influence of hospital isolation on the mortality—I find that during the past ten years over 16,000 cases of scarlet fever have been treated at the City Hospital, and the mortality amongst them has been 4·4 per cent. On the other hand nearly 3,000 cases were treated in their own homes, and showed a

case-mortality of 4·6 per cent. Thus the mortality among the home-treated cases was a little higher than among the cases removed to hospital, notwithstanding the fact that for the most part the patients kept at home belonged to better class families, and could have good nursing and medical treatment. If the cases which occurred in the homes of the poor had remained there for treatment there is little doubt the case-mortality among the patients treated at home would have been far higher.

Diphtheria.

Diphtheria

Perhaps the most pleasing feature in the statistics for the year is the large reduction in the cases and deaths attributed to diphtheria (including membranous croup). How great this reduction has been can be seen from the following figures :—

	Cases Notified.	Deaths Registered.
1892	533	102
1893	387	83
1894	406	91
1895	741	214
1896	1,194	293
1897	713	160
1898	689	132
1899	720	147
1900	542	77

It is very gratifying to be able to report that the deaths from diphtheria during 1900 were fewer than in any other year since the extension of the city in 1891.

Diphtheria at the Blue Coat School.

Thirty of the cases of diphtheria occurred at the Blue Coat School, and Dr. Hutchinson, the medical attendant, has furnished me with some interesting particulars relating to them. It appears that the outbreak at the school commenced on October 8th, and by October 20th no less than 27 cases had occurred. The scholars were, in consequence, disbanded. They reassembled on November 16th, when it was hoped the disease had been stamped out. A few days afterwards, however, two fresh cases occurred, and a bacteriological examination of the throat of every scholar was then made. The diphtheria bacillus was definitely discovered in no less than 41 instances, and its presence was suspected in 28 others. None of these cases showed any clinical signs or symptoms of the disease, however, and it must be concluded that though the diphtheria germs were present they did not obtain sufficient hold to cause an attack of the disease. Soon after the results of the examinations were known the healthy scholars were sent home, and those whose throats showed the presence of the bacillus, either distinctly or

indefinitely, were isolated in separate parts of the school buildings. Their throats were painted regularly with Lœffler's solution, and I am pleased to say that none of them developed diphtheria.

I could not discover how the disease was first introduced into the school, but there seemed little doubt that the later cases were due to infection from the first one. An examination of the school premises was made by the Inspector of Nuisances, and several sanitary defects were pointed out, which have been remedied.

Full advantage was taken, during the outbreak, of the knowledge to be gained by bacteriological examination of the throat secretions, no less than 455 specimens from the throats of the scholars having been examined at the University. In the severe cases anti-toxin was injected, but the great majority of the cases were of a mild type, and all the patients recovered.

Diphtheria and bacteriological examinations

Including those from the Blue Coat School, 848 specimens from the throats of real or suspected cases of diphtheria were bacteriologically examined on behalf of your Committee. Most of the specimens were examined at the commencement of the patient's illness, with the object of confirming the clinical diagnosis; in a number of instances, however, the examination was made after the patient had apparently recovered in order to ascertain if the throat had become free from the bacillus.

Diphtheria and anti-toxin.

Three hundred and twenty-eight doses of anti-toxin serum were issued, two doses being sent as a rule to each patient treated with it.

I am pleased to find that the case-mortality of diphtheria was last year unusually low, and this gratifying circumstance must, I think, be attributed in part to the use of anti-toxic serum. The case-mortality before and after the gratuitous distribution of serum began, viz., in June, 1897, is shown in the statement below:—

	Case-mortality from Diphtheria and Membranous Croup.
1893	21 per cent.
1894	22 ,,
1895	29 ,,
1896	25 ,,
1897 (January to June) ...	25 ,,
1897 (July to December) ...	20 ,,
1898	19 ,,
1899	20 ,,
1900	14 ,,

Diphtheria and anti-toxin—(*continued*).

At the request of your Committee I made a special report to you in June last upon the use of anti-toxin, of which the following is a copy :—

"DIPHTHERIA AND ANTI-TOXIN.

"The information in my possession respecting the effect of the use of anti-toxic serum in Birmingham is of a somewhat meagre and inconclusive character. The register kept at Mason University College shows the name and address of each patient for whom anti-toxin was issued, but I have no means of knowing whether the serum was actually used for the person for whom it was issued, nor whether the injection was made early or late in the illness, nor whether the case was a mild or a severe one, nor whether the hygienic surroundings and the nursing facilities were good or bad. In the absence of these particulars it is impossible to form an unquestionable judgment as to the effect of the serum as used in Birmingham. I have, however, done the best I can with the information at my disposal, and the result is as follows :—

"It appears that in 1899 anti-toxin was issued on behalf of 212 patients, and by searching the death registers I have ascertained that 39 of these patients died. At first sight, therefore, it would appear that the case-mortality among patients treated with anti-toxin was 18 per cent. But an examination of the deaths shows that in a number of instances the anti-toxin must have been received too late to be of the slightest service. Thus 12 of the patients were dead before the anti-toxin was despatched from Mason University College, 5 others died on the day of despatch, and possibly before the anti-toxin reached their homes, and another 5 died the day after anti-toxin was issued. In these 22 cases, therefore, the anti-toxin issued was probably not used, or, if used at all, it must have been injected after the case had become hopeless.

"It would appear, then, that at least 22 cases can hardly be said to have used the anti-toxin which was issued to them. This leaves 190 cases in which the serum seems to have been actually used, and of these 190 patients 17 died, giving a mortality of only 9 per cent. This is certainly a most gratifying figure for diphtheria cases.

"Turning now to the cases in which anti-toxin was probably not used, I find they numbered 530, and resulted in 130 deaths, showing a case-mortality of 25 per cent. This is about the same percentage as generally obtained before anti-toxin was introduced.

Diphtheria and anti-toxin—(*continued*).

"As I have already pointed out, the figures given are not very reliable. Nevertheless my enquiry convinces me that amongst cases treated with anti-toxin at an early stage of the illness the mortality has been remarkably low. I am also convinced, however, that anti-toxin is looked upon too often as a last resource instead of being used at the very commencement of every severe case of diphtheria, and in consequence its utility is in many cases quite destroyed.

"I have endeavoured further to obtain statistics showing the effect of anti-toxic serum in other towns.

"The figures issued by the Metropolitan Asylums Board for 1898 are as follows :—

5,186 cases treated with anti-toxic serum, mortality 17·5 per cent.

1,186 cases not so treated, mortality 7·1 per cent.

"At first sight, therefore, it would seem that the use of anti-toxin in London augments instead of reduces the mortality. This, however, is explained by the circumstance that the severe cases are treated with anti-toxin while the mild ones are not. The benefits derived from the use of serum can be better judged from the following figures :—

Mortality for all cases before serum was used, 30·3 per cent.

Mortality for all cases since serum was introduced, 18·4 per cent.

"Thus the introduction of anti-toxic serum was followed by an enormous reduction in the case-mortality. The Board consider that most of the reduction is due to the serum, though part of it may have resulted from diminished malignancy of the cases. They consider that anti-toxin is the most valuable remedy yet discovered for diphtheria if used early in the illness, i.e., not later than the 2nd or 3rd day.

"The Medical Officer of Health for Glasgow has sent me a report of the Superintendent of the Glasgow Hospitals, in which he states that a remarkable reduction has taken place in the case-mortality of diphtheria. This reduction is too great to be attributed to the mildness of the cases, and he considers anti-toxin has played an important part in its causation.

Diphtheria and anti-toxin—(*continued*).

"The Medical Officer of Health, Liverpool, states that he has no statistics on the subject, but the general experience in Liverpool has been exceedingly favourable to the use of the serum.

"The Medical Officer of Health for Manchester informs me that anti-toxin is provided by the Corporation there, but he does not give any information as to its effect.

"In Edinburgh anti-toxic serum is not provided for gratuitous distribution, but at the City Hospital it has been used in increasing quantities with a correspondingly diminishing mortality.

"In Bristol the serum is not officially issued to medical practitioners, but the Medical Officer of Health and the Medical Superintendent of the City Hospital believe it to be the most effectual remedy known to us for diphtheria cases.

"Anti-toxic serum is issued in Leeds, but the Medical Officer of Health has no statistics showing its effect. Since its introduction, however, the case-mortality from diphtheria has decreased, but whether this is due to the use of the serum or to the cases being less severe he is unable to say.

"The Medical Officer of Health for Sheffield cannot give statistics such as I have asked for, but he informs me that the case-mortality of diphtheria has decreased since anti-toxic serum was introduced, and he attributes this result entirely to the use of the serum. He states, however, that in his experience the serum is frequently used by the general practitioner at too late a period and in too sparing amounts. In the Sheffield City Hospital the cases treated with the serum had a mortality of 16·2 per cent., those cases in which the serum was injected on the 1st, 2nd, or 3rd day of illness having the lowest mortality.

"The most remarkable statistics with which I am acquainted in this connection are those obtained at Chicago. In this city several Medical Inspectors have been appointed who are specially qualified to diagnose and treat diphtheria cases. Whenever a medical man suspects diphtheria he can at once call in a Medical Inspector by telephone. The latter immediately visits the patient, and if he thinks the case is probably one of diphtheria he injects anti-toxin at once. By this means early treatment

Diphtheria and anti-toxin—(*continued*).

with the serum is obtained. The results are most astounding. Prior to the introduction of the system the case-mortality was over 35 per cent.; since its introduction, three and a half years ago, it has been only 6·7 per cent.

"Moreover, in the four months ending February, 1899, 418 cases were treated, with a mortality of only 4·7 per cent. Out of 129 cases treated in the first or second day of illness not one died, and out of 114 treated on the third day only 3 died. These figures indicate the wonderful results obtained by the use of anti-toxin by a skilled practitioner and at a very early stage in the illness.

"From the enquiries I have made there appears to be a universal consensus of opinion that the use of anti-toxic serum is attended with extraordinary success provided the serum is injected early enough. The aim of your Committee, in face of this opinion, should be twofold (1) to secure the administration of the serum directly the medical attendant suspects that he has a case of diphtheria to deal with; and (2) to encourage a more extensive use of the serum than obtains at present. As bearing on the second of these points the following figures will be of interest:—

"In Edgbaston and Harborne Ward, in 1899, 77 per cent. of the diphtheria cases had anti-toxin from Mason University College. In Bordesley Ward the percentage was 41. In contrast to this, in Duddeston, Nechells, and St. Paul's Wards not one of the 61 patients appears to have had anti-toxin; while in St. George's, St. Stephen's, and St. Mary's Wards anti-toxin was officially issued for only 11 per cent. of the notified cases. Generally speaking, anti-toxin serum seems to be much less frequently resorted to in the poorer wards than elsewhere, which is certainly not a satisfactory circumstance. This fact confirms the opinion that the poorer patients will not derive the fullest advantage from the use of anti-toxin until a hospital has been provided to which they can be removed."

Whooping Cough.

Whooping Cough.

The deaths from whooping cough numbered 301 last year, or 59 more than the average number in the five previous years. As is usually the case, whooping cough caused nearly as many deaths as scarlet fever, diphtheria, and typhoid fever combined.

Whooping Cough and school attendance.

In 1899 I drew up a handbill giving simple directions as to the steps to be taken when whooping cough breaks out in a household, and copies of this handbill were sent to all houses in which the disease was known to be present. Among other points in the handbill I urged that all children should be kept away from school when anyone in the house has whooping cough.

In the early part of last year I received a letter from a resident in the City in reference to a case of whooping cough in his house. He felt himself placed in a difficulty, inasmuch as he had received a handbill from me giving directions that all his children must be kept from school, while the School Attendance Officer told him that only the patient was to be kept at home, the other members of the family attending school as usual. I found on enquiry that instructions had been issued by the School Board, on the advice of their Medical Officer, to the effect that no children except those who were ill need stay at home on account of whooping cough, so that the instructions given by the School Board and those issued by me were entirely at variance on this point.

I then expressed to you my very strong opinion that it is necessary for all the children of a household to cease attending school when there is a case of whooping cough in the family. Whooping cough is one of the most infectious of the zymotic diseases and causes more deaths than any other except diarrhœa and measles. On account of its intense infectiousness no single precaution ought to be neglected which may limit its spread. There is no doubt that the infection is carried very readily in the clothes of healthy persons who have been in contact with a patient. In small houses, where any efficient isolation is impossible, the clothing of the inmates must necessarily become infected, and it is therefore most desirable that all the children in infected houses should be excluded from school as long as the patient "whoops."

My views on this matter are borne out by the instructions of the Medical Officers of Schools Association, who order children in infected houses to remain at home for three weeks after the last exposure to infection. The London School Board excludes all the children from infected houses for a fortnight, and in Manchester all such children are excluded until the "whoops" have ceased. It appears indeed to be the general rule to keep all children from school as long as a case of whooping cough exists in the house.

Negotiations subsequently took place between your Committee and the School Board, and ultimately it was arranged that when whooping cough breaks out in a household the children who have not previously had an attack shall remain at home, while those who have already suffered from the disease shall continue to attend school as usual. I feel in duty bound to say, however, that I entirely disapprove of this arrangement, because I believe that in most cases the children who continue to attend school will carry infection from the home with them to their school-fellows.

In this opinion I have the further support of the Local Government Board, who issued a memorandum in 1894, in which they said: "It may be laid down as a universal principle that all children suffering from any dangerous infectious disorder (*i.e.*, of a nature dangerous to some of the persons attacked by it, however mild in other cases) should be excluded from school until there is reason to believe that they have ceased to be in an infectious condition."

"Furthermore, as it is rarely possible to provide effectual separation of the sick from the healthy within the homes of children of the class attending public elementary schools, it must commonly be necessary that all children of an infected household should be excluded from school; first, because otherwise such children might attend school while suffering from the disease in a latent form, or at an unrecognised stage; and, secondly, because it is known that infection may attach itself to, and be conveyed by, the clothes of a person living in an infected atmosphere, even though the person himself remain unaffected.

"The diseases for the prevention of which school closure, or the exclusion of particular children, will be required are principally those which spread by infection directly from person to person, such as diphtheria, scarlet fever, measles, whooping cough, epidemic influenza, small-pox, and rötheln."

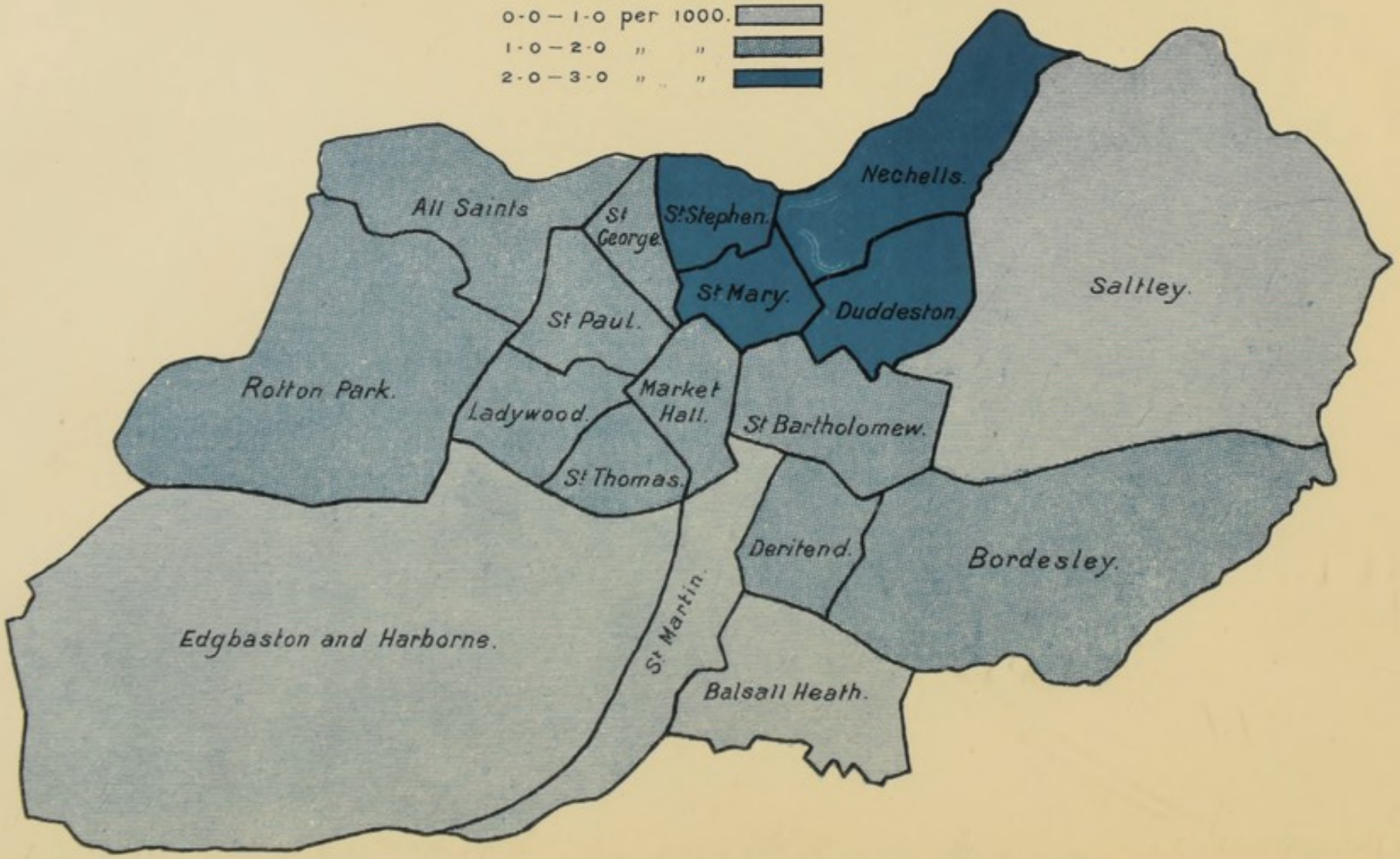
Typhoid Fever.

Typhoid Fever

Your Committee will remember that in the fourth quarter of 1899 typhoid fever became epidemic in Birmingham. I am sorry to say the excessive prevalence of the disease continued throughout 1900, the number of cases in the four quarters and in the whole year being as follows:

	Cases of Typhoid Fever.	Above or below the average.
1st Quarter	200	+ 56
2nd ,, ...	130	+ 31
3rd ,, ...	148	+ 26
4th ,, ...	373	+165
Year	851	+277

TYPHOID FEVER CASE-RATES.



Thus the greatest prevalence of the disease occurred as usual in the fourth quarter. Every quarter, however, showed an excessive number of cases.

The prevalence and mortality of typhoid fever in previous years is shown by the figures given below :—

	Cases Notified.	Deaths Registered.
1892 ...	260 ...	39
1893 ...	489 ...	94
1894 ...	511 ...	105
1895 ...	436 ...	82
1896 ...	483 ...	108
1897 ...	533 ...	89
1898 ...	637 ...	113
1899 ...	779 ...	119
1900 ...	851 ...	179

These figures indicate that the year 1900 had a worse record than even 1899 in regard to typhoid fever.

Typhoid Fever in Wards.

In my last annual report I commented at some length on the epidemic of the disease in the fourth quarter of 1899. Among other things, I stated that the facts which I ascertained concerning the outbreak pointed to the conclusion that the epidemic originated near the junction of St. Stephen's, St. Mary's, and Nechells Wards, and spread largely by means of infected persons and things, in diminishing degrees of intensity to the more and more distant parts of the town. To show this more clearly, a map of the City was introduced showing by various shades of colour the intensity of the epidemic in the various wards. Last year the case-rates in the wards were as follows :—

	Tyhoid Fever. Case-rates per 1,000.
Duddeston	3·00
St. Stephen's	2·88
St. Mary's	2·36
Nechells	2·14
Ladywood	1·98
St. Paul's	1·92
St. George's	1·92
Rotton Park	1·79
St. Thomas'	1·75
St. Bartholomew's	1·70
Market Hall	1·53
Deritend	1·53
All Saints'	1·35
Bordesley	1·05
St. Martin's	0·97
Saltley	0·70
Balsall Heath	0·64
Edgbaston and Harborne	0·55

An examination of the above figures and of the map on the opposite page reveals two things : (1) that the greatest prevalence of typhoid fever in 1900 was practically in just the same part of the city as in 1899 ; and (2) that once again

there have been signs that the prevalence of the disease in the various wards has been largely governed by the distance at which they are situated from the area of principal prevalence. These two features appear to point to the conclusion that the infection must have been retained in a marked degree in the district where the disease was most prevalent last year—largely, no doubt, owing to insanitary conditions existing there—and also that the spread of the disease into more remote parts of the town was again due in a great measure to personal infection occasioned by insufficient isolation and disinfection.

Typhoid Fever and direct infection.

Numerous direct examples of the spread of the disease owing to these deficiencies are to be found in my records. The following is a case in point:—On July 10th a boy named Charles P———, living at the back of 30, D——— Road, was reported to be suffering from typhoid fever. He was not removed, although living in a house with only two bedrooms, occupied by six people. On July 31st, three weeks after Charles P——— was notified, I was informed that Violet K———, living at No. 3 in the same yard, had contracted the disease, and a week later, that her sister, Agnes K———, was also ill of it. These two cases, also, were kept at home, although their house had only two bedrooms and was occupied by six people. Seventeen days later three more cases were reported in their home. On August 18th a case occurred in the house which is built back to back with that occupied by the first patient, Charles P———. Then, on August 27th, the father of Charles P——— was reported to have caught the disease, the interval between the two cases in this family being about seven weeks. A few days later a third case was notified in the same house, and, later still, a fourth case, making ten cases in all in less than two months in that one block of property. Arranged in the form of a table the cases are as follows:—

July	10	Charles P—(son)	1 back of 30, D— Rd.	Not removed.
,,	31	Violet K—	3 back of 30, D— Rd.	Not removed.
Aug.	6	Agnes K—	3 back of 30, D— Rd.	Not removed.
,,	18	Rosanna B—	3 back of 34, D— Rd.	Not removed.
,,	23	Frederic K—	3 back of 30, D— Rd.	Removed.
,,	23	Fred K—	3 back of 30, D— Rd.	Removed.
,,	23	William K—	3 back of 30, D— Rd.	Not removed.
,,	27	Charles P—(father)	1 back of 30, D— Rd.	Not removed.
Sept.	1	Emma P—	1 back of 30, D— Rd.	Removed.
Oct.	1	May P—	2, L—Crescent, D—St. (Late of 1 back of 30, D— Road.)	Not removed.

There is little doubt that effective isolation and disinfection, attained best of all by removal of the patient to hospital, would have prevented some at least of the above cases.

Typhoid Fever Hospital.

While writing this Report, I am glad to note that since March 18th, 1901, a ward at the City Hospital, Little Bromwich, has been open for the reception of typhoid fever cases, and I trust that all patients who cannot have proper isolation and nursing at home will avail themselves of the privilege of removal. The need for a larger number of removals to hospital is shown by the fact that during the fourth quarter of last year, the quarter in which the greatest prevalence occurred, 244 typhoid fever patients, or about two-thirds of the entire number, were treated at home. Moreover, 101 of these cases treated at home were in houses with two bedrooms only, and a number of these houses contained as many as 7 other inmates besides the patient.

The effect of removal to hospital is very great in preventing further cases in the same house and among the patient's friends and relatives not necessarily living there. It is also most noticeable in increasing the patient's chance of recovery. Thus in the quarter just mentioned, of the patients treated in hospital only 12 per cent. died, while 24 per cent. of the cases treated at home succumbed to the disease. This is not surprising, when it is remembered that a great many cases occurred in the homes of the poor, where skilful nursing, suitable diet, and good hygienic surroundings are not generally available.

Typhoid Fever and Widal's test.

About the middle of November your Committee arranged as an aid to early diagnosis of typhoid fever, that Widal's test should be carried out at the University, if the medical attendant wished it, free of charge either to him or to the patient. Between the middle of November and the end of the year 86 tests were applied for and made. Of these 86 cases, 50 were shown to be typhoid fever, while 33 did not give the characteristic reaction. The latter were either not cases of typhoid fever or the examination was not made during the particular period when the reaction is observable. The absence of the reaction in such instances possesses no positive value. In three other cases it could not be definitely decided whether the reaction was given or not. In several instances the cases would not have been definitely regarded as typhoid fever had it not been for the result of the test. Its positive indications therefore are of great value in confirming clinical observation.

Typhoid Fever and filth conditions.

The experience of the past year confirms the opinion I had previously expressed that typhoid fever makes its home in the poorer and dirtier parts of the town, where the sanitary arrangements, especially in regard to the removal of filth, are of an inferior character, and where adequate isolation and disinfection are scarcely possible.

Typhoid Fever and food

There was no evidence that drinking water or milk had anything to do with the spread of the disease, but some of the patients thought they were made ill by eating mussels or oysters.

Throughout the year the preventive measures described in my last annual report were carried out. Now that the application of Widal's test and the provision of hospital accommodation is in force, I think it will be possible to cope with future cases of typhoid fever in a much more successful manner than in the past.

DIARRHŒA.

Diarrhœa.

The deaths from diarrhœa numbered 613, or 110 less than the average number for the five previous years. From enteritis there were 409 deaths, or 38 less than the average number.

Diarrhœa and improved sanitation.

The history of diarrhœa in Birmingham during the past few years is of peculiar interest, because in 1898 it was decided, as a result of a severe outbreak in the preceding year, to adopt certain special measures with a view to reducing the mortality from this disease. These measures included the frequent swilling and deodorizing of pan privies and ash-places, and the cleansing of gutters and drain-traps by Corporation workmen engaged for this particular purpose; the paving of unpaved and dirty yards; and the conversion of a larger number of ashpit and pan privies. Since these special efforts were inaugurated, in 1898, no less than 243,737 cleansings of privies, 105,677 of ash-places, 82,108 of gutters and 193,541 of drain-traps have been done; while 995 yards have been paved, and 3,538 ashpit privies and 684 pan privies have been converted to water-closets.

I propose now to enquire whether these measures have had the desired effect, and to do this I shall compare the two years 1897 and 1898, which would be affected very slightly if at all by them, with the years 1899 and 1900, during which they were in full operation.

The view is generally accepted that the essential cause of epidemic diarrhœa is closely associated with insanitary conditions, especially those which result in the filthiness of the dwelling and its surroundings, notably of the soil. But there can be no doubt that the extent of any particular epidemic is determined, other things being equal, by the amount of hot weather. Now I find from

my records that the years 1899 and 1900 were much hotter than the two previous years. Thus in 1899-1900 a temperature of 80 degrees and upwards was recorded on 15 days, against only 9 in 1897-1898. Similarly the temperature exceeded 75 degrees on 47 occasions in the last two years, against 28 in the two previous years. Moreover, the temperature of the ground 4 feet from the surface, which Ballard considered to be far more closely connected with diarrhœa than the temperature of the air, exceeded 56 degrees on 49 occasions in the years 1899-1900, against only 12 in 1897-1898. I have taken the latter temperature because it is that at which Ballard found that diarrhœa usually becomes epidemic.

Roughly speaking, it may be said that there were nearly twice as many very hot days in the last two years as in the two previous years, and if the sanitary condition of the town had remained unchanged there is no reason to doubt that the diarrhœal mortality would have shown in consequence a great increase. But this was not the case, for the deaths from diarrhœa and enteritis numbered 2,433 in 1899-1900, against 2,656 in 1897-1898. Perhaps these facts will stand out more clearly if arranged in the form of a table.

	1897-1898.	1899-1900.
Days on which 80° and upwards were registered	9	15
,, ,, 75° ,, ,, ,,	28	47
,, ,, 56° ,, ,, ,, 4ft. below surface of ground	12	49
Deaths from diarrhœa and enteritis ...	2,656	2,433

The above figures show at a glance that the much hotter weather in the second of the two periods was accompanied by a somewhat smaller diarrhœal mortality, a result reasonably attributable to the work done in mitigating such filth conditions as dirty privies and ashplaces, foul drains, unwholesome yard surfaces, and offensive privies. This result is very encouraging, and should stimulate to further efforts in the same direction.

Plague.

Notification of plague.

During the autumn I received from the Town Clerk a copy of an order made by the Local Government Board by which the provisions of the Infectious Disease (Notification) Act are so extended as to apply to plague. In accordance with a request contained in that order I forwarded a circular to every medical man in Birmingham, of which the following is a copy :—

"Health Department,
"The Council House,
"September, 1900.

"Dear Sir,

"NOTIFICATION OF CASES OF PLAGUE.

"I have to inform you that the Local Government Board have issued an order by which the Provisions of the Infectious Disease (Notification) Act are so extended as to apply to Plague. In accordance with this order, it will be your duty to report to me any case of Plague that may come under treatment by you, in the same manner as cases of other notifiable diseases; and the usual fees will be paid for such notifications.

"I remain,

"Yours faithfully,

"ALFRED HILL, M.D.,

"Medical Officer of Health."

I am glad to say that no case of the disease has occurred in Birmingham, although I received information from certain Port Sanitary Authorities of a few persons from plague-infected places who had been allowed to proceed to Birmingham. All such persons were interviewed and kept under observation for a time, but, happily, no outbreak of the disease occurred.

Plague is a disease which, like typhus fever, does not usually obtain a foothold except in dirty squalid districts inhabited by the poorest class of people. It is, therefore, unlikely to become prevalent in any district which is in a hygienic condition.

WOMEN HEALTH VISITORS.

Women Health Visitors.

The work done by Women Health Visitors has recently excited an extraordinary amount of interest in various parts of the country, and last year I received numerous enquiries from Medical Officers of Health and others interested in sanitary matters as to the way in which our Visitors work and the success they meet with.

I propose, therefore, to describe in some detail the work done by the Health Visitors last year, partly for the information of your Committee and partly because I know that other Sanitary Authorities will be glad to have a full account of it.

Health Visitors' duties.

The instructions given to the Visitors when they commenced their duties were as follows:—

To visit from house to house in such localities as the Medical Officer of Health shall direct.

To carry with them disinfectant powder, and use it when required.

To direct the attention of those they visit to the evil of bad smells, want of fresh air, and dirty conditions of all kinds.

To give hints to mothers on the feeding and clothing of their children, and to use their influence in getting children sent regularly to school.

In cases of sickness, to assist in promoting the comfort of the invalid by advice and personal help.

To urge, on all possible occasions, the importance of cleanliness, thrift and temperance.

They must note—

(1) The general sanitary condition of the house.

(*a*) The number of rooms and of occupants.

(*b*) The existence of bad smells, and whether they arise from deficient ventilation, from bad drainage, or from accumulation of filth.

(*c*) The state of the walls and floors: whether dirty from the tenant's or landlord's neglect, or in need of repair.

(2) The general mode of living, particularly with regard to personal and domestic cleanliness.

(3) The feeding and clothing of children, especially of those under two years old. Whether the baby is nursed by the mother, or fed by hand; if the latter, what it is fed upon.

(4) Any cases of illness in the house—

(*a*) Nature of the disease.

(*b*) Whether there is a medical man in attendance.

(*c*) How far the necessary sanitary precautions are being carried out.

When this work was commenced in 1899 there were but four Visitors, and only those streets were visited which had a very large proportion of houses let at about 3/6 per week. These, of course, are the poorest streets in the town; they are the streets in which unhealthy conditions are most

common ; and, as I have shown more than once, they are also the streets in which terribly high death-rates are recorded. At the beginning of the fourth quarter, 1900, the number of Health Visitors was increased to eight, and it then became possible to include a number of streets which had previously been left untouched.

The number of primary visits paid during the past year was 17,832, and the conditions discovered amply justify your Committee in taking up this work. In addition to the primary visits 3,929 re-visits were paid to houses where this was necessary on account of want of cleanliness, illness, or some other cause.

It may be well to state here that the work of the Health Visitors is quite different from that of the Inspector of Nuisances and Assistant Inspectors. Their duty is primarily to show people how to make the best of the existing conditions in their homes, how to bring up their children, and how to nurse their sick. They are not intended to inspect the sanitary arrangements at the houses they visit, although they are instructed to note any obvious defects in order that these may be reported to me and referred to the Inspector of Nuisances whose duty it is to attend to them.

Health Visitors and ventilation.

One of the most noticeable features at the houses visited is the utter disregard of ventilation. Most of the houses are necessarily badly ventilated because they have neither back doors nor windows, and very many of them have but little air space even in front. It is, therefore, most desirable that the windows should be opened as much as possible. But unfortunately this is very often not done, and last year it was necessary to tell the tenants to open the windows at 3,454 of the houses visited, and to unstop the chimney at 920. An open chimney, of course, acts as an excellent outlet for bad air, and every room ought to be provided with one, which I am sorry to say is not the case.

Health Visitors and want of cleanliness.

At 2,402 houses the tenants were told to clean the floors, etc. In some cases the floors were in an indescribable condition. Wherever cleaning is ordered re-visits are paid to see that the work has been done.

Health Visitors and neglected bedrooms.

Another point to which attention has to be directed is the early removal of slops from the bedrooms. This is a matter which is very much neglected, and was ordered at 3,153 houses last year. I suppose that in most cases this work would be done in the evening, but it is not at all uncommon to find an accumulation of solid and liquid

excreta evidently of some days' standing and necessarily in a most offensive and unhealthy condition. Moreover it is evident that in some instances chamber utensils are used in the day time, as they are found in the downstairs rooms and sometimes even in the pantry. It appears probable that this most unhealthy habit is induced in some cases by the fact that the privy is situated some distance away from the house. There are, of course, hundreds of houses in Birmingham the inmates of which have to pass along a part of the street, down an entry and across a yard to reach the privy provided for their use. The inadequacy and publicity of the closet accommodation is indeed one of the glaring faults connected with our court houses.

Health Visitors and sleeping accommodation.

Enquiry into the sleeping accommodation is a part of the Health Visitors' work. It is the custom of the Visitors to ask how many persons sleep in each room and in each bed, and advice is given as to the best means of utilizing whatever accommodation is available. At 257 houses too many persons were found to be sleeping in one room, although another bedroom, quite empty, was available; in some cases this condition arose from the fact that the second bedroom was in need of repairs; in others, it resulted from sheer indifference and ignorance, a desire to save labour or expense, or a feeling that it is warmer to be huddled together. In 69 instances the tenants were urged to get additional beds, chiefly because either parents and their children, or young people of opposite sexes, were sleeping in the same bed. As many as 154 families were urged to get a larger house, but this unfortunately is a very difficult matter for poor people with large families and small means. At 36 houses it was found that lodgers were causing overcrowding and they were ordered to leave.

Health Visitors and dirty bedding.

The Visitors also examine the bedding, and in 516 cases last year they had it cleansed. A number of mattresses were found to be so filthy and verminous that they were burnt.

Health Visitors and accumulations of filth.

At 258 houses accumulated stale food, vegetable refuse, filthy rags, and other offensive matters were burned.

Health Visitors and neglected children.

An important part of the Health Visitors' work is the attention given to young children and to sick persons. At 564 houses the children were in a dirty, neglected condition, their hair being in some cases so full of lice that it had to be all cut off and the scalp poulticed for several days before the revoltingly filthy and diseased mass could be removed.

In a large number of instances advice was given as to the most suitable food for infants.

Health Visitors and sickness.

At 5,308 of the houses visited there was sickness of some kind, and the Visitors gave advice as to the nursing of the sufferers. At 418 houses where the illness was of a serious nature no doctor was in attendance, and it was necessary to urge the inmates to obtain the services of one without delay. In a certain number of cases where there was a medical attendant, his orders were not being acted upon, and the Visitors pointed out the necessity of following his advice in every particular.

Health Visitors' handbills.

In the course of their work the Visitors have distributed a very large number of handbills relating to the management of the house and yard, the feeding of infants, and the precautions to be taken against measles, diarrhœa, typhoid fever, and consumption. At the same time they have explained verbally the chief points contained in the same.

From time to time they have reported cases to the Relieving Officer of the Parish, the Birmingham and District Nursing Society, the Police-Aided Association for Clothing Children, the National Society for the Prevention of Cruelty to Children, and other philanthropic bodies.

Health Visitors and sanitary defects.

In visiting so large a number of houses, the Visitors have become aware of a great many sanitary defects which it is the duty of the landlord to remedy. Among these may be mentioned :—

Houses with dirty walls and ceilings	1,274
,, ,, damp walls	352
,, ,, broken walls and ceilings	553
,, ,, defective roofs	699
,, ,, ,, spouting	93
,, ,, broken floor quarries	74
,, ,, ,, ,, boards	114
,, ,, ,, windows and window sashes	82
,, ,, ,, window cords	86
,, ,, defective stairs	95
,, ,, ,, pantries	16
,, ,, accumulations of rubbish in cellar	45
Yards unpaved and filthy	34
Accumulations of rubbish in yards	54
Drains in yards obstructed	87
Water-closets stopped up	46
Water-closets and privies filthy and defective	108
Ashplaces defective	173
Washhouses defective	59

I think, after the foregoing description of the Health Visitors' work, it will be unnecessary for me to say that it cannot fail to have a direct and marked influence on the comfort and health of the poorer section of our population.

Anyone acquainted with our courts and terraces will know that, bad as are the conditions necessarily existing there, owing to want of air space, deficiency of light, inadequate privy accommodation, and general dilapidations, these conditions are intensely aggravated by the carelessness of many of the tenants. This carelessness, with its attendant high mortality, the Health Visitors are doing much to remedy.

Health Visitors and intemperance.

The greatest difficulty experienced by the Health Visitors arises from the intemperance of a considerable section of the persons visited. Most of the gross cases of neglect of home and children are associated with drunkenness on the part of either one or both parents. How far the drunkenness is induced in the first place by their miserable surroundings it is difficult to determine; it is probably both a cause and an effect of them.

HOUSE ACCOMMODATION.

Occupied houses.

According to the figures kindly supplied to me by the Overseers for the various parishes, there were 109,578 occupied houses in the City in March, 1900. It may be of interest if I give the number of occupied houses, as ascertained by the Overseers, in each ward for the year 1900, and also for 1896, the earliest year for which I possess this information:—

Ward.	Occupied Houses, 1900.	Occupied Houses, 1896.	Increase or Decrease.
Rotton Park	9,442	8,354	+ 1,088
All Saints'	9,028	7,827	+ 1,201
Ladywood	5,645	5,703	− 58
St. Paul's	3,630	3,762	− 132
St. George's	4,632	4,577	+ 55
St. Stephen's	4,882	4,749	+ 133
St. Mary's	3,237	3,174	+ 63
St. Bartholomew's	5,326	5,195	+ 131
Market Hall	2,335	2,429	− 94
St. Thomas'	4,170	4,050	+ 120
St. Martin's	5,260	5,150	+ 110
Edgbaston and Harborne ...	6,373	5,734	+ 639
Deritend	5,248	5,269	− 21
Bordesley	11,514	9,412	+ 2,102
Duddeston	5,132	4,795	+ 337
Nechells	7,021	6,757	+ 264
Balsall Heath	8,650	8,200	+ 450
Saltley	8,053	5,720	+ 2,333

From these figures it is clear that since 1896 a very large number of new houses must have been built in the outer wards, such as Saltley, Bordesley, All Saints', and Rotton Park. Where an increase in the number of inhabited houses is shown in the older and more central wards, such increase is almost all due, not to the building of new

houses, but to the marked decrease in the number of voids. Thus, in Birmingham Parish, which comprises the whole or the greater part of the first ten wards in the list, there were 3,273 void houses in 1896, and only 1979 in 1900.

So far as I am aware, the houses built in the outer wards all contain five rooms and upwards, and very few are offered at a rental of less than 6/- per week. They are, therefore, within the means of the better-paid artizan, but not of the labourer.

Need of more small houses.

At the present time there seems to be some relaxation in the demand for small houses, but this is apparently due to a number of families having given up housekeeping while the husband and father is with the troops in South Africa. I am still of opinion, therefore, that the accommodation for the labouring classes is altogether inadequate, and that until a large number of dwellings suitable for labourers are built, it would be unwise to close any considerable number of the existing houses, although many of them are not really fit to live in. Furthermore, while small houses are so scarce it is easy for landlords to get tenants for very defective ones, which under other circumstances no one would care to occupy, and hence it is difficult to get the existing houses kept in proper repair.

Defective houses.

In the early part of last year I made a special inspection of three blocks of property and reported to you that, though the houses were in great need of repairs, I did not consider that they called for demolition. They were weatherproof, and the health of the inmates was fairly good. It appeared to me that it would be a serious disadvantage to destroy so many habitable houses at a time when that particular class of house was numerically insufficient for the demand, as the result must be a still greater overcrowding of other houses. I therefore urged that it would be preferable and more economical to put these houses at once into thoroughly good repair, and to seek unoccupied areas for the construction of additional workmen's dwellings.

I see no reason for altering the opinion expressed in my last annual report, that the best policy at the present time is for the Corporation to build a large number of labourers' dwellings on unoccupied land, within a mile or so of the centre of the City.

"Dual" dwellings in Milk Street.

Something has already been done to meet the demand for small houses by the Estates Committee, who have erected a block of "dual" dwellings in Milk Street. The

buildings comprise five artizans' houses and 56 labourers' dwellings. The latter are built in two storeys, which are absolutely separate from each other, the upper storey being reached by a staircase, and an outside balcony running along the front of the houses. There are altogether 24 tenements consisting of two rooms, and 32 containing three rooms. In the two-roomed tenements one room measures 13 feet by 14 feet, and the other 12 feet by 9 feet. In the three-roomed tenements the living room is 13 feet by 14 feet, one bedroom is 8 feet by 14 feet, and the other 9 feet by 9 feet. Each tenement comprises a scullery, with a water-tap over the sink, and a "copper" for boiling clothes, a well-ventilated food pantry, a water-closet, and a place for coal. The rooms of each tenement are all on the same level, those on the ground floor opening directly on to the street, and those on the upper floor on to the balcony. When once inside the set of rooms the tenant has absolute privacy, there being no means of communication with another tenement except through the front doors. Each tenement has a dust-bin, or dust-shoot, for dry refuse, and the water-closet serves to carry away the bedroom slops, so that there is no necessity to leave the dwelling while engaged in ordinary household work. At the rear of the dwellings there is a large open space, paved with blue bricks, suitable for a playground.

Labourers' Dwellings in Milk Street—*(continued)*.

The tenements are all let at about 1/6 per room per week. No difficulty was experienced in getting tenants, and they are largely of the labouring class, or at any rate are receiving little, if any, more than labourer's wages. One of the tenants is deputed to act to a certain extent as a caretaker. He is at work during the day, but in the evening spends some time in looking after the property. One or two objectionable tenants obtained admission to the dwellings, but have since been got rid of.

There can be no doubt that these "dual" houses compare most favourably with the ordinary labourers' dwellings in the neighbourhood. Some of their obvious advantages may perhaps be pointed out. In the first place they have ample light and ventilation, two prime necessities for a healthy existence. Then each house has its own water-closet, a very great boon to those who have lived in a court where a set of privies, a long way from the houses and in a most public position, has to be used in common by the inmates of a number of houses. Having a water-closet and a dust receptacle near at hand, the tenants will not be tempted to retain bedroom slops and household refuse in their rooms, nor yet to throw them on the surface of the yard as they so often do in the courts.

Further, the provision of a constant supply of water inside the houses will make it much easier to practise personal and domestic cleanliness, and lastly, the houses will be kept in good repair and cleanly condition. In this respect, as I have stated before, the houses owned by the Corporation on the Improvement Area compare most favourably with other houses of the same class and rental.

The general plan on which the Milk Street houses are built, appears to me to be very good, and I should like to see similar buildings erected in other parts of the town. For poor people who require two, three, or four rooms near the centre of the town, separate houses are out of the question. It seems to me that in Birmingham it ought to be possible to accommodate our labouring classes in convenient situations in tenements, after the style of those in Milk Street, either two or three storeys high, and consisting of suites of two, three, and four rooms.

Houses closed or put in order.

Last year, at the instance of the Inspector of Nuisances, 88 of the worst houses in the town were closed and 34 were demolished under the provisions of the Public Health Act, and 5 were closed under the Housing of the Working Classes Act. Fifty-one houses which would otherwise have been closed were put in habitable condition. As many as 2,240 houses were repaired and 2,188 were cleansed. The two latter figures are much larger than in former years, owing to the additional amount of information obtained through the Health Visitors, who report to me any sanitary defects they observe, and these I bring to the notice of the Inspector of Nuisances, with a view to their being remedied.

CLOSET ACCOMMODATION.

Conversion of ashpit privies.

The number of ashpit privies, the conversion of which into water-closets has been obtained, is 858. This is a smaller number than in 1899 and 1898, when 1,222 and 1,458 respectively were converted.

Conversion of pan-privies.

Only 275 pan-privies were replaced by water-closets at the instance of the Health Department. This is a very small number in comparison with the total number in existence, viz., about 30,000.

Pan-privies and ill-health.

As I stated in my last annual report, I am firmly convinced that pan-privies are a fruitful source of ill-health, and I cannot suppose that the health of the town will be satisfactory as long as they are allowed to exist.

Cleansing of privies and ash places.

In order to keep the pan privies and ashplaces as free from nuisance as possible, they are swilled and deodorized at certain times. Last year 90,656 cleansings of privies and 61,693 of ashplaces were effected. Notwithstanding this frequent cleansing, some of the privies are allowed to get into a filthy state, and the tenants of three courts were summoned for not keeping them clean, fines amounting to nearly £7 being inflicted.

Limewashing of privies.

In addition to the above work, 540 privies and closets were limewashed by the landlord. In some other instances the work was done by the Corporation staff and the cost recovered from the owner.

Repairing of privies and closets.

Defective pan-privies and water-closets when discovered are ordered to be repaired, and last year 339 of the former and 736 of the latter were put in order. When an ashpit-privy is found in a defective condition the owner is expected to have it converted into a water-closet.

COURTS AND YARDS.

Cleansing and paving of courts.

Last year 2,751 courts were cleansed by the Corporation staff by arrangement with either the owners or the tenants, and at their expense. Unfortunately there are still a large number of unpaved courts, which of course cannot be properly cleansed. Last year 245 back yards and courts were paved, and 425 were repaired at the instance of the Inspector of Nuisances. The paving, however, is frequently done in a very unsatisfactory manner, without proper cementing, and not therefore impervious to filthy soakage, the non-absorption of which is the real object.

In addition to cleansing the court surfaces where possible, the court cleansers cleared 72,468 surface drains and 141,737 drain traps.

LODGING HOUSES.

Common lodging houses.

At the end of the year there were 76 common lodging houses in the city, giving accommodation to 2,470 lodgers. Three houses were closed during the year and two fresh ones opened.

Houses let in lodgings.

Fifteen houses were registered as houses let in lodgings, and three were closed, leaving 111 on the register at the end of the year. They are registered to accommodate 545 lodgers.

To the Common Lodging Houses and the Houses let in Lodgings 12,167 visits were paid by day and 999 by night. Four keepers were summoned for breaking the bye-laws and fined.

CANAL BOATS.

Canal Boats.

At the close of the year there were 379 Canal Boats on the register, 25 having been put on and 31 taken off duing the year. The number of boats inspected was 846, and 2,099 men, women, and children were found on them. Eleven boats were overcrowded, and four had no proper provision for the separation of the sexes. Two had dirty cabins, four were in such a defective state as to be uninhabitable, and nine had not a proper receptacle for storing drinking water, while a number of others had not complied with the necessary regulations as to marking and registering.

WORKSHOPS.

Workshops.

The number of visits paid to workshops was a large one, viz., 12,064. In 1,795 instances lime-washing was ordered and carried out, and numerous other sanitary improvements were made. Thus 252 premises were repaired, and 150 were more efficiently ventilated ; 337 new water-closets were provided, and 345 were repaired. Among other work done may be mentioned the conversion of pan and ashpit privies, provision of urinals, trapping of drains, removal of refuse. and the reduction of the number of employés in cases of overcrowding.

The special Workshop Inspector visits systematically the whole of the workshops on the register, all of which have been examined once at least since this method was adopted.

DAIRIES, COWSHEDS, AND MILKSHOPS.

Dairies and Milkshops.

Three hundred and seventy-five applications to be placed on the register of milksellers were received during the year, of which 200 were granted, the remainder being refused on the ground of unfitness after an inspection of the premises.

At the end of the year there were 2,487 milkshops, 105 purveyors of milk, and 24 dairies on the register. The visits paid numbered 11,740 to milkshops, and 612 to dairies.

Limewashing was ordered in 1,398 instances ; the sale of tripe, fish, pickles, lamp oil, etc., was prohibited in 679 cases, and dirty vessels were found in 437 instances.

A good deal of attention was paid to milk churns inspected at Railway Stations, 273 of which required cleansing.

Mr. J. Malcolm, F.R.C.V.S., the Veterinary Surgeon appointed to examine cows and inspect cowsheds, has been good enough to supply me with the following report of his work :— Cowsheds.

"During 1900 the Veterinary Surgeon and his assistant have regularly inspected the cows and cowsheds within the city. On December 31st, 1900, there were 31 cowkeepers on the register, in whose names 61 cowsheds were registered to contain 608 cows. There have been very few changes on the register during the year, only 4 cowsheds being removed and 3 new ones added. One new application was not granted. During the year the visits of inspection of cows in registered sheds numbered 735. These visits have been so arranged that the whole of the cows were inspected periodically, the udder of every cow as a rule being examined once a month.

"As a result of the inspection 36 cows have been placed under special examination, and while this continued the sale of their milk was prohibited. Of these 11 had slight induration of the udder, but as the lacteal secretion was not altered in character the cows were at once re-admitted to the dairy stock.

"Two had cowpox, and with respect to these I may say they were newly purchased cows, and had the disease in its incubative stage when they were purchased. The affection went through its natural evolution, and on the cows' recovery their milk was again allowed to be sold.

"Twenty-one were found to be suffering from mastitis, either of a subacute catarrhal character, or a more acute suppurative condition. In the catarrhal cases the milk when newly drawn shows little apparent change, but if allowed to stand until the cream separates, it looks watery and almost translucent, while there appears to be a mucoid material mixed with the cream. On microscopic examination of the milk, epithelial cells, leucocytes and a few streptococci are recognised. The disease usually runs a subacute

Cowsheds—*(continued).*

or chronic course, and it is some time before recovery takes place and the milk regains its normal character, but in the end recovery is the rule. In the acute suppurative cases the milk is markedly altered in character. In the early stages it has the appearance of a dirty flaky serous fluid of a reddish brown tint; set aside in a vessel it separates into three layers, precipitated caseine at the bottom, a dirty reddish brown whey in the centre, and a mucoid-like greasy material on the top. Microscopic examination reveals the presence of epithelial cells, blood cells and numerous streptococci. Later on the milk becomes thicker and more or less purulent in character, until eventually it appears to be little other than a very thick creamy pus. The almost invariable termination is loss of the secreting power of the affected quarter. When either recovery or complete loss of the secreting function takes place the cows are re-admitted to the dairy stock.

"The remaining two cows had tuberculosis of the udder. In both cases the disease was first diagnosed clinically, and this was subsequently verified by the demonstration under the microscope of the tubercle bacilli in the milk. Needless to say the milk of both was at once and permanently prohibited from sale, and the owners finally disposed of the affected cows.

"In comparison with 1899 you will observe there were only 2 cases of tubercular mastitis against 12 then recorded, and last year's favourable result may, I think, be largely attributed to the extra care exercised by the cowkeepers to purchase healthy cows free from defect or disease of the udder, a rule they have regularly followed since the systematic veterinary inspection of the cows has been adopted. Although the cases of suppurative mastitis were slightly more numerous than in 1899, yet they were not more common than is usual in other districts; e.g., in a recent inspection of the London dairy cows 1·6 per cent. were found to be affected with this complaint, whereas the 21 recorded cases in Birmingham give an average at each inspection of less than ·5 per cent.

"Generally speaking both the cows and cowsheds have been kept fairly clean, and the majority of the cowkeepers have readily complied with any request either in respect of maintaining greater cleanliness or making any requisite alteration."

BAKEHOUSES.

Bakehouses.

The number of visits paid to Bakehouses was 1,033. In 112 instances limewashing was ordered and carried out, while at four places various sanitary defects were remedied. One new bakehouse was erected during the year.

SLAUGHTER-HOUSES.

Slaughter-houses.

The Slaughter-houses in the City are inspected by the Officers of the Markets and Fairs Committee, under the direction of Mr. Edwards, Superintendent of Markets. Last year 9,874 visits were paid to them. No offences against the bye-laws were discovered, and in only 19 cases was it necessary to order the premises to be cleansed.

At the present time there are 76 registered and 93 licensed slaughter-houses in the city.

UNWHOLESOME FOOD.

Bad meat.

The returns submitted by Mr. Edwards, Superintendent of Markets, show that 1,512 lots of bad meat were handed over to the officers voluntarily, and that 23 lots were seized by them. The total weight of bad meat destroyed was 216 tons, and nine persons were fined for exposing bad meat for sale, the fines amounting to £52.

Bad fish.

Five lots of bad fish were seized, and 492 surrendered voluntarily, the total amount destroyed being 56 tons.

Bad fruit.

Sixty-nine tons of bad fruit were destroyed. One vendor was prosecuted and fined £1.

ARSENIC IN FOOD AND DRINK.

Arsenic in beer.

During the autumn of 1900 arsenical poisoning became very prevalent in certain parts of the country, and was found to be due to the presence of arsenic in small quantities in beer. In consequence of this I tested 32 samples of beer and 12 of brewing materials. Only one sample of beer contained any arsenic at all, and that only in very minute quantity—about one-hundredth part of a grain per gallon. In two samples of glucose, however, a much larger quantity was present. I communicated with the firms from which these three samples were obtained, and they recalled all the beer which was likely to be contaminated, and ceased using the impure glucose. I

also examined 18 samples of golden syrup and table syrup, 17 of jam and marmalade, and eight of sugar confectionery, in the making of which glucose is sometimes used. None of them showed any signs of arsenic.

Deaths from neuritis and alcoholism.

At the request of Dr. Buchanan, who was appointed by the Local Government Board to enquire into the outbreak of arsenical poisoning, I ascertained from the death returns the number of deaths due either primarily or secondarily to neuritis and alcoholism during the last five years. They were as follows :—

	Alcoholic Neuritis.	Peripheral Neuritis.	Multiple Neuritis.	Neuritis.	Alcoholism.
1896	6	4	1	1	53
1897	2	5	4	0	54
1898	7	7	6	2	47
1899	3	6	7	2	39
1900	3	7	2	3	26

By enquiring at the General Hospital, Queen's Hospital, Workhouse Infirmary, and Skin and Urinary Hospital, I learned that fewer cases of alcoholic neuritis were treated at these institutions in the last half of 1900, when arsenical poisoning was prevalent in certain parts of the country, than in the first half. I also found that the deaths recorded in the City from the same complaint were fewer in the last half of the year.

There is every reason to believe, therefore, that practically the whole of the beer brewed and consumed in Birmingham has been free from arsenic.

WATER SUPPLY.

Corporation water.

I made an analysis of the Corporation Water each month, the results of which are given in Table XIV.

I also analysed 169 samples of water taken from streams and deep wells, from which the Corporation Supply is derived. These I reported upon to the Water Committee.

Well water.

Eleven samples of shallow well water were examined, either on account of the presence of infectious disease or because of a complaint of the quality. Most of the wells have since been closed.

SMOKE NUISANCES.

Smoke.

The officers appointed to discover breaches of the regulations regarding the emission of dense black smoke from factory chimneys made 9,358 observations, with the result that 125 manufacturers were reported to have broken the rules. Of these, 89 were cautioned, and 35 were summoned and fined.

OFFENSIVE TRADES.

Proposed bone boiling works.

Early in the year an application was received for permission to carry on a bone boiling business in Adderley Street.

The premises proposed to be used were situated in St. Bartholomew's Ward, which has always a very high death-rate. It, therefore, appeared to me most undesirable to establish in that ward an admittedly offensive trade, with its effluvium nuisances and depressing effects, especially as the establishment of such a business does not usually stop at the one process, but is commonly associated with the making of candles, size, and artificial manure. For many years we had a good illustration of the nuisance arising from a combination of such trades in the case of a well-known business which proved an intolerable and irrepressible nuisance.

I am aware that the Public Health Act provides for insisting on the best mode of conducting such works, but it is indisputable that it is practically impossible to obviate nuisance, particularly as in time the operations often become extended and the precautions relaxed.

Your Committee has for a long time refused to sanction the establishment of offensive trades in the City, because you have found that it is impossible to carry on an offensive trade like that of bone-boiling and tallow-

melting in the midst of a large population without creating a nuisance and an injury to health. The town is indeed already suffering too much from the existence of filth conditions, and the establishment of an offensive trade could not fail to aggravate the evil. I therefore urged your Committee to refuse the application, and this was done.

Complaint of bone boiling works.

Later in the year complaints were made of the nuisance arising from the process of bone-boiling which was carried on at button works in Little Edward Street. I inspected the premises and found besides the button factory a large iron tank in which bones were boiled for the extraction of the fat and gelatine, which were sent away. This large tank was unprovided with any means either for carrying off the vapours or destroying them, and produced much offensive effluvium. There were four small open vessels which were used for softening the extracted bones before they were cut into buttons. There was no objection to this process as it did not give rise to nuisance, and did not come under the denomination of the offensive trade known as bone-boiling. The large tank was the only one that did so; and I found that the sanction of your Committee had never been obtained for its establishment, which, therefore, was illegal, and exposed the owner to heavy penalties. There appeared no reason whatever for fresh bones to be treated on these premises; the process might have been carried on outside the city, or the bones obtained ready boiled. There was also a large accumulation of bones on the ground, some of them mouldy, but not very offensive. The only matter of which serious complaint could be made was the bone-boiling. It appeared to me that it was a great nuisance and injurious to health, and I therefore recommended that it should be done away with, an easy matter seeing that the process was carried on illegally, without the consent of the Health Committee.

In accordance with my recommendation your Committee refused to sanction the process of bone-boiling on the premises.

ANALYTICAL WORK.

Miscellaneous analyses.

Including those already alluded to under the heading Water Supply, I received during the year 405 samples of water, sewage, and other articles not coming under the Food and Drugs or Margarine Acts. The following table gives particulars of the various Committees for whom articles were analysed.

	Number of Samples.	
WATER COMMITTEE—		
Water	198	
Milk	1	
	—	199
HEALTH COMMITTEE—		
Water, Effluent	27	
Jam, Golden Syrup, &c.	36	
Beer, Brewing Materials	18	
Demerara and other Sugars	21	
Lubricant, Cloth, Poudrette, &c.	34	
	—	136
PUBLIC WORKS COMMITTEE—		
Cloth, Lining	32	
Sewage, &c.	12	
	—	44
WATCH COMMITTEE—		
Cloth and Uniforms		10
ESTATES COMMITTEE—		
Paint		7
OTHER COMMITTEES—		
Water, &c.		9
TOTAL SAMPLES ...		405

I remain,

Mr. Chairman and Gentlemen,

Your obedient Servant,

ALFRED HILL, M.D.,

Medical Officer of Health.

APPENDIX.

TABLE I.

MARRIAGES, BIRTHS, AND DEATHS IN THE FIFTEEN YEARS 1886-1900.

YEAR.	MARRIAGES.	BIRTHS.	DEATHS.				
			Males.	Females.	Total.	Of Infants under One Year old.	From Seven chief Zymotic Diseases.
1886	—	15,622	—	—	9,182	2,712	1,462†
1887	—	15,315	—	—	9,225	2,670	1,424†
1888	—	15,076	—	—	8,465	2,293	924†
1889	—	15,357	—	—	9,035	2,579	1,270†
1890	—	15,487*	—	—	10,329*	2,798*	1,391*†
1891	—	16,166	5,175	4,902	10,077	2,673	976†
1892	4,322	16,026	4,934	4 708	9,642	2,664	1,279
1893	4.103	15,881	5,315	5,130	10,445	3,146	1 520
1894	4,241	15,505	4,659	4 287	8.946	2,539	1,237
1895	4,442	16,014	5,154	4,708	9,863	2,910	1,350
1896	5,024	16,582*	5,354*	5,051*	10,405*	3,265*	1,846*
1897	5.515	16,771	5,572	5,096	10,668	3,594	1,909
1898	5,321	17,289	5,152	4,782	9,936‡	3,287	1,400
1899	5,337	17,609	5,521	5,003	10,524§	3,398	1,490
1900	4,904	16,941	5,810	5,072	10,882§	3,366	1,394

* 53 weeks. † Membranous Croup not included. ‡ 2 sex unknown.

§ The number of deaths has been corrected as far as possible by excluding those of persons not belonging to Birmingham who died in hospitals in the city, and including the deaths of Birmingham citizens who died in workhouses and asylums outside the city boundary.

TABLE II.

POPULATION, MARRIAGE-RATES, BIRTH-RATES, AND DEATH RATES IN THE FIFTEEN YEARS 1886-1900.

Year.	Estimated Population.	Persons to an Acre.	Marriage-rate per 1,000 persons living.	Birth-rate per 1,000 persons living.	Death-rate per 1,000 persons living.	Death-rate in Infants under One Year per 1,000 Births.	Death-rate from Seven chief Zymotic Diseases.
1886	458,110	36·1	—	34·2	20·1	174	3·2*
1887	462,251	36·4	—	33·2	20·0	174	3·1*
1888	466,430	36·7	—	32·4	18·2	152	2·0*
1889	470,646	37·0	—	32·7	19·2	168	2·7*
1890	474,900	37·4	—	32·1	21·4	181	2·9*
1891	479,193	37·7	—	33·8	21·1	165	2·0*
1892	483,526	38·1	17·9	33·2	20·0	166	2·7
1893	487,897	38·4	16·9	32·6	21·5	198	3·1
1894	492,301	38·7	17·3	31·6	18·2	164	2·5
1895	496,751	39·1	17·9	32·3	19·9	182	2·7
1896	501,241	39·5	20·0	32·5	20·4	197	3·6
1897	505,772	39·8	21·9	33·2	21·1	214	3·8
1898	510,334	40·2	20·9	34·0	19·5	190	2·8
1899	514,956	40·5	20·8	34·3	20·5	193	2·9
1900	519,610	40·9	18·9	32·7	21·0	199	2·7
Average of 5 years prior to 1900	505,811	39·8	20·3	33·3	20·3	195	3·2

* Membranous Croup not included.

1.—Population at Census 1891, 478,116.
2.—Number of Inhabited Houses at Census 1891, 95,516.
3.—Average number of Persons in each house at Census 1891, 5·0.
4.—Area of the City, in acres, 12,705.

TABLE III.

Deaths Registered in the City of Birmingham during the Year ending December 29th, 1900.

1900.	AGES.								WARDS.																					
	0—1	1—5	5—10	10—15	15—25	25—45	45—65	65 and up	Rotton Park.	All Saints'.	Ladywood.	St. Paul's.	St. George's.	St. Stephen's.	St. Mary's.	St. Bartholomew's.	Market Hall.	St. Thomas'.	St. Martin's.	Edgbaston & Harborne.	Deritend.	Bordesley.	Duddeston.	Nechells.	Balsall Heath	Saltley.	Not located.	City.
ALL CAUSES	3366	1287	188	118	428	1521	2008	1876	773	828	484	346	539	615	475	749	234	399	527	441	645	851	569	739	619	681	368	10882
Small-pox	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Measles	35	91	3	..	1	..	..	..	4	8	9	1	4	3	5	4	..	12	3	5	12	18	17	14	1	10	..	130
Scarlet Fever	8	65	18	..	1	..	1	..	11	9	2	4	2	1	4	4	1	2	2	2	6	12	2	13	5	11	..	93
Diphtheria	3	38	12	4	4	2	1	..	7	..	9	3	4	1	..	3	..	4	2	2	6	8	3	7	5	..	..	64
Membranous Croup	3	10	..	..	..	..	..	..	..	..	..	..	1	1	..	2	..	..	1	1	1	1	2	2	1	..	..	13
Whooping Cough	129	166	6	..	..	..	..	..	35	29	16	13	24	24	18	14	5	1	11	4	26	29	10	15	13	8	6	301
Typhus Fever	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Enteric or Typhoid Fever	1	4	11	14	62	72	15	..	18	17	9	2	12	13	13	7	3	8	5	2	12	13	9	18	10	7	1	179
simple Continued, or Ill-defined Fever	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1
Relapsing Fever	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Influenza	5	4	3	..	12	37	69	55	16	16	6	6	7	12	5	14	1	5	8	12	7	17	15	8	13	13	4	185
Other Miasmatic Diseases	3	2	1	..	..	..	..	..	..	2	..	..	1	..	..	1	..	..	..	..	..	..	..	..	1	1	..	6
Asiatic Cholera	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Diarrhœa, Dysentery	475	92	..	2	1	8	11	24	35	47	21	15	36	51	19	54	11	24	32	15	51	45	33	54	28	32	10	613
Malarial Diseases	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Zoogenous Diseases	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Venereal Diseases	19	..	1	..	..	3	5	1	3	5	1	2	1	2	..	3	..	2	1	..	1	3	..	1	2	1	1	29
Erysipelas	8	..	1	..	..	9	5	3	4	1	2	1	1	2	1	2	1	1	1	1	1	2	3	..	..	1	1	26
Puerperal Fever	..	..	..	..	10	16	..	..	5	2	2	1	1	1	..	..	2	2	..	..	4	2	1	2	..	1	..	26
Other Septic Diseases	1	..	..	..	1	..	2	1	1	1	..	..	..	..	..	..	..	..	..	..	..	1	1	1	..	..	..	5
Parasitic Diseases	4	..	..	..	1	..	..	..	..	..	..	1	..	1	..	1	1	..	..	..	1	..	..	..	..	..	..	5
Intemperance	..	..	..	..	1	11	12	3	3	4	..	..	2	2	2	3	1	2	2	..	1	..	1	..	1	3	..	27
Other Dietic Diseases	22	1	..	..	..	..	..	..	4	1	..	..	1	1	..	2	..	..	1	..	5	5	1	..	2	..	..	23
Rheumatic Fever	..	1	6	6	4	11	4	2	2	2	3	..	1	..	2	..	..	..	..	4	3	4	2	3	2	6	..	34
Rheumatism	..	..	..	2	..	3	15	8	1	3	..	3	1	1	2	4	1	..	1	3	2	..	1	..	1	3	1	28
Rickets	12	20	..	..	..	..	..	..	5	5	1	2	..	2	..	2	2	1	..	..	1	5	1	1	4	..	..	32
Cancer, Malignant Disease	..	2	1	..	3	52	205	105	27	35	22	13	15	14	13	17	10	16	18	28	21	37	9	14	20	31	8	368
Tabes Mesenterica	68	22	3	3	4	2	2	..	15	8	8	6	3	5	2	7	2	6	1	1	6	8	8	8	3	6	1	104
Tubercular Meningitis	24	25	5	1	..	1	..	..	8	8	5	..	2	2	4	2	1	1	3	1	4	3	2	2	2	4	2	56
Phthisis pulmonalis	2	7	7	11	118	454	221	27	43	60	37	29	56	53	48	67	31	24	51	30	42	72	37	47	53	43	24	847
Tuberculosis, Scrofula	20	18	8	2	4	8	7	4	3	8	3	3	1	3	2	8	3	3	6	5	4	3	2	1	6	2	5	71
Other Constitutional Diseases	3	3	2	1	7	10	23	7	6	8	2	4	3	3	3	2	1	..	4	4	4	2	2	1	5	1	1	56

1900.	AGES.								WARDS.																	
	0—1	1—5	5—10	10—15	15—25	25—45	45—65	65 and up.	Rotton Park.	All Saints'.	Ladywood.	St. Paul's.	St. George's.	St. Stephen's.	St. Mary's.	St. Bartholomew's.	Market Hall.	St. Thomas'.	St. Martin's.	Edgbaston & Harborne.	Deritend.	Bordesley.	Duddeston.	Nechells.	Balsall Heath	Saltley.	Not located.	City.
Premature Birth	353	..	..	..	..	..	..	..	37	33	20	8	19	17	11	31	2	12	16	12	20	25	12	19	28	21	10	353
Atelectasis	12	..	..	..	..	..	..	..	1	1	1	..	..	..	..	..	..	..	2	2	..	3	..	..	..	2	..	12
Congenital Malformations	33	..	..	1	1	..	..	..	3	3	1	1	5	1	1	1	..	2	1	..	1	4	1	3	2	5	..	35
Old Age	..	..	..	..	..	..	17	547	34	40	33	23	23	24	25	24	17	24	36	33	28	34	17	27	35	30	57	564
Convulsions	178	36	..	..	..	..	..	..	11	12	6	2	8	9	13	19	2	9	17	4	13	20	12	19	11	17	1	214
Other Diseases of Nervous System	84	73	18	15	28	105	244	192	50	57	36	16	45	38	36	37	16	29	46	47	30	63	38	58	31	46	40	759
Diseases of Eye, Ear, and Nose	7	8	4	4	1	1	..	..	4	3	..	1	1	1	2	2	3	2	1	1	..	1	..	1	..	2	..	25
Heart Disease	17	6	12	15	37	145	275	186	58	48	24	24	32	45	17	38	12	17	27	35	48	62	34	50	58	41	23	693
Other Diseases of Circulatory System	..	..	..	1	2	11	24	22	6	6	4	2	1	1	3	3	4	2	3	3	2	5	4	3	5	2	1	60
Croup	4	5	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1	1	1	2	3	..	..	9
Bronchitis, Pneumonia, Pleurisy	560	366	15	10	42	281	528	435	120	135	94	77	110	134	87	202	48	85	98	82	116	175	141	146	118	153	106	2227
Other Diseases of Respiratory System	28	21	3	1	5	22	28	29	17	9	4	4	6	2	4	11	1	7	3	6	5	7	12	8	11	15	5	137
Dentition	60	41	..	..	..	..	..	..	8	23	6	2	7	4	1	8	..	3	2	7	3	7	3	6	5	6	..	101
Enteritis	331	50	4	..	3	7	5	9	19	23	14	11	29	36	48	26	4	6	14	7	25	16	24	59	20	23	5	409
Cirrhosis of Liver	..	..	..	..	..	32	70	9	8	8	3	5	4	3	9	8	6	3	7	9	9	6	4	8	7	3	1	111
Other Diseases of Liver	14	..	1	..	1	4	17	13	7	2	..	2	..	1	..	1	2	2	2	3	2	8	4	2	5	6	1	50
Other Diseases of Digestive System	88	23	6	7	30	28	60	42	21	18	12	8	7	10	10	16	7	7	17	26	14	31	16	17	21	25	1	284
Diseases of: Lymphatic System and of Ductless Glands	..	1	..	1	2	3	2	1	2	2	..	..	..	3	..	..	..	..	..	..	1	..	..	..	1	1	..	10
Diseases of: Urinary System	3	13	8	..	5	60	124	52	23	25	11	10	14	8	9	25	8	18	22	11	16	8	8	14	19	11	7	265
Diseases of: Organs of Generation	..	..	..	..	2	12	10	2	4	1	1	3	1	..	..	1	4	..	2	2	2	..	2	3	..	..	..	26
Diseases of: Parturition	..	..	..	..	9	44	2	..	3	3	1	3	5	6	4	3	..	2	4	3	4	4	2	..	3	5	..	55
Diseases of: Organs of Locomotion	2	3	4	8	2	2	6	4	1	4	1	..	..	1	..	2	3	1	2	1	2	3	1	2	..	1	6	31
Diseases of: Integumentary System	7	..	2	..	1	5	7	9	3	1	..	..	3	2	3	1	2	3	..	1	1	4	2	1	..	2	2	31
Accidental Suffocation	92	3	..	1	..	..	1	..	14	8	3	6	4	9	8	10	2	5	2	3	7	1	2	7	1	4	1	97
Other Accidents	10	29	21	6	18	36	46	26	16	12	10	5	8	8	7	13	6	11	7	7	18	21	12	6	8	14	3	192
Homicide	1	..	..	..	..	2	3	..	..	..	..	..	..	..	..	2	..	2	..	..	..	..	..	..	..	1	1	6
Suicide	..	..	..	1	3	18	19	3	3	5	..	2	3	..	1	2	..	5	1	..	3	7	5	..	2	4	1	44
Execution	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Debility, Atrophy, Inanition, Marasmus	670	35	1	..	..	..	2	..	40	57	40	19	24	53	28	40	8	25	42	15	51	34	44	61	45	51	31	708
Other Ill-defined and not specified causes	27	2	1	1	2	4	16	5	4	10	..	3	1	1	5	2	..	3	..	1	2	2	5	5	2	6	..	52

NOTE.—Deaths in hospitals, workhouses, and asylums, and deaths in streets or other public places have been referred as far as possible to the wards in which the deceased persons had resided.

TABLE IV.

DEATHS FROM THE PRINCIPAL ZYMOTIC DISEASES IN THE FIFTEEN YEARS, 1886 TO 1900.

	1886.	1887.	1888.	1889.	1890.*	1891.	1892.	1893.	1894.	1895.	1896.*	1897.	1898.	1899.	Annual Average of 5 years prior to 1900.	1900.
Smallpox	0	2	0	0	0	7	0	70	171	8	4	0	0	0	2	0
Measles	402	251	202	214	354	107	340	48	316	133	310	414	182	196	247	130
Scarlet Fever ...	42	37	40	162	218	95	68	68	75	133	154	95	47	29	92	93
Diphtheria ...	80	67	48	59	66	43	67	43	50	163	246	130	114	118	154	64
Membranous Croup	?	?	?	?	?	?	35	40	41	51	47	30	18	29	35	13
Whooping Cough ...	99	403	248	297	224	303	285	321	219	173	386	227	256	168	242	301
Fever — Typhus	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Fever — Enteric or Typhoid	63	77	64	45	64	80	39	94	105	82	108	89	113	119	102	179
Fever — Continued ...	6	8	5	4	2	1	2	8	4	2	2	0	2	0	1	1
Diarrhœa	770	579	317	489	463	340	443	828	256	605	589	923	668	831	723	613

* 53 weeks.

TABLE V.

DEATHS FROM CERTAIN CAUSES IN THE YEARS 1891-1900.

DEATHS FROM	1891.	1892.	1893.	1894.	1895.	1896.*	1897.	1898.	1899.	1900.
Cancer	324	293	313	303	332	346	376	342	386	368
Phthisis	815	716	775	630	718	694	679	718	841	847
Other Tubercular Diseases	266	265	270	229	287	258	258	236	237	231
Premature Birth	295	345	359	346	376	384	425	372	367	353
Old Age	477	348	541	388	510	430	482	475	535	564
Bronchitis, Pneumonia, and Pleurisy ..	2,469	2,100	2,188	1,811	1,770	1,838	1.870	1,626	1,831	2,227
Diseases of Nervous System	902	864	915	861	931	989	939	963	1,013	973
Diseases of Heart	673	684	584	586	613	628	641	674	631	693
Diseases of Digestive System...	570	597	712	582	772	828	1,027	1,021	1,053	955
Diseases of Urinary System	222	225	256	215	207	230	234	230	249	265
Accident or Negligence	356	292	296	280	329	279	326	327	331	289
Debility, Atrophy, Inanition, and Marasmus...	593	592	750	615	658	677	623	639	614	708

* 53 weeks.

TABLE VI.

BIRTH-RATES AND DEATH-RATES IN 33 GREAT TOWNS DURING 1900. (*Extracted from the Registrar-General's Annual Summary.*)

CITIES AND BOROUGHS.	BIRTH-RATE.	Death-Rates per 1000 Persons living from									DEATHS under 1 Year to 1000 Births.	PERCENTAGE to Total Deaths.		CITIES AND BOROUGHS.
		All Causes.	Principal Zymotic Diseases.	Small-pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping-cough.	Fever.	Diarrhœa.		Inquest Cases.	Uncertified Causes of Death.	
33 TOWNS	29·4	19·5	2·50	0·00	0·43	0·13	0·35	0·45	0·20	0·94	172	7·6	1·3	.. **33** TOWNS.
LONDON	28·6	18·8	2·22	0·00	0·42	0·08	0·34	0·43	0·17	0·78	160	9·4	0·6	LONDON.
WEST HAM	28·6	15·9	3·10	—	0·48	0·05	0·50	0·59	0·18	1·30	189	6·7	1·6	WEST HAM.
CROYDON	24·9	14·6	1·44	—	0·15	0·04	0·18	0·44	0·07	0·56	132	9·2	—	CROYDON.
BRIGHTON	23·6	17·8	2·24	—	0·43	0·10	0·58	0·28	0·09	0·76	166	6·7	0·5	BRIGHTON.
PORTSMOUTH	25·7	17·3	2·38	—	0·01	0·06	0·53	0·46	0·47	0·85	155	7·2	1·8	PORTSMOUTH.
PLYMOUTH	27·9	20·8	2·35	—	0·93	0·01	0·11	0·12	0·21	0·97	175	5·7	0·3	PLYMOUTH.
BRISTOL	27·8	16·7	1·88	—	0·62	0·12	0·31	0·17	0·13	0·53	133	8·4	0·6	BRISTOL.
CARDIFF	26·8	13·8	2·08	0·01	0·84	0·06	0·42	0·21	0·12	0·42	141	8·5	0·6	CARDIFF.
SWANSEA	26·7	17·1	2·17	—	0·64	0·07	0·58	0·15	0·15	0·58	175	7·2	1·1	SWANSEA.
WOLVERHAMPTON	33·5	22·5	3·65	0·01	0·82	0·09	0·10	0·79	0·45	1·39	206	6·5	0·9	WOLVERHAMPTON.
BIRMINGHAM*	32·7	21·5	2·72	—	0·25	0·19	0·14	0·58	0·35	1·21	199	5·2	2·3	BIRMINGHAM*.
NORWICH	28·4	17·6	2·08	—	0·01	—	0·10	0·59	0·12	1·26	178	5·9	1·0	NORWICH.
LEICESTER	28·2	17·4	3·54	—	0·23	0·13	1·51	0·21	0·12	1·34	175	6·0	1·9	LEICESTER.
NOTTINGHAM	27·7	19·1	2·35	—	0·18	0·22	0·12	0·42	0·33	1·08	196	6·3	0·8	NOTTINGHAM.
DERBY	26·9	17·5	2·30	—	0·90	0·20	0·06	0·48	0·19	0·47	174	10·1	—	DERBY.
BIRKENHEAD	29·0	16·8	1·39	—	0·09	0·03	0·09	0·24	0·14	0·80	160	8·2	0·9	BIRKENHEAD.
LIVERPOOL	36·0	25·7	3·18	0·03	0·23	0·17	0·26	0·84	0·21	1·44	186	5·8	4·1	LIVERPOOL.
BOLTON	29·0	19·5	2·42	—	0·23	0·12	6·12	0·53	0·27	1·15	171	7·3	0·5	BOLTON.
MANCHESTER	32·3	24·1	3·05	—	0·47	0·19	0·18	0·68	0·14	1·39	189	7·8	1·0	MANCHESTER.
SALFORD	33·1	25·1	3·98	0·00	0·56	0·45	0·41	0·84	0·31	1·41	207	6·8	0·9	SALFORD.
OLDHAM	24·2	19·6	2·44	0·02	0·71	0·36	0·13	0·58	0·11	0·53	172	5·6	0·1	OLDHAM.
BURNLEY	25·3	16·3	2·53	—	0·14	0·48	0·19	0·36	0·14	1·22	205	4·5	1·3	BURNLEY.
BLACKBURN	25·1	20·5	3·52	0·01	0·57	0·61	0·65	0·45	0·22	1·01	220	4·3	2·6	BLACKBURN.
PRESTON	29·0	24·0	4·37	—	1·07	0·29	0·38	0·57	0·39	1·67	236	2·6	3·1	PRESTON.
HUDDERSFIELD	22·8	16·8	1·52	—	0·55	0·16	0·02	0·18	0·18	0·43	132	4·3	2·9	HUDDERSFIELD.
HALIFAX	23·0	18·1	1·32	—	0·50	0·17	0·13	0·07	0·22	0·23	132	4·4	4·0	HALIFAX.
BRADFORD	23·1	16·4	1·36	—	0·39	0·25	0·11	0·09	0·23	0·29	141	6·9	0·9	BRADFORD.
LEEDS	30·4	20·0	2·92	0·00	0·58	0·12	0·59	0·38	0·20	1·05	183	8·5	0·5	LEEDS.
SHEFFIELD	34·1	22·6	4·33	—	0·55	0·17	1·26	0·55	0·28	1·52	200	4·2	3·0	SHEFFIELD.
HULL	32·9	19·7	3·10	0·08	0·58	0·16	0·08	0·31	0·21	1·68	183	6·4	2·1	HULL.
SUNDERLAND	35·8	21·4	2·52	—	0·59	0·27	0·15	0·20	0·37	0·94	169	6·2	1·8	SUNDERLAND.
GATESHEAD	36·3	19·0	1·75	—	0·14	0·07	0·05	0·56	0·08	0·85	169	2·9	3·0	GATESHEAD.
NEWCASTLE	30·4	19·5	1·38	—	0·39	0·07	0·14	0·33	0·08	0·37	170	9·1	1·0	NEWCASTLE.

TABLE VII.

NUMBER OF CASES REPORTED UNDER THE INFECTIOUS DISEASE (NOTIFICATION) ACT, 1889, DURING EACH WEEK OF THE YEAR 1900.

Week. Number.	Week. Date of ending.	Small Pox.	Scarlet Fever	Diphtheria.	Membranous Croup.	Typhus Fever.	Typhoid Fever.	Simple Continued Fever.	Relapsing Fever.	Puerperal Fever.	Cholera.	Erysipelas.	TOTAL.
	1900.												
1	January 6th	...	16	8	1	...	25	...	...	...	...	18	68
2	,, 13th	...	20	3	...	...	24	1	...	..	...	14	62
3	,, 20th	...	22	10	1	...	24	...	...	...	...	12	69
4	,, 27th	...	36	12	...	...	18	...	...	...	...	13	79
5	February 3rd	...	24	6	...	...	15	...	...	...	...	13	58
6	,, 10th	...	21	11	...	...	7	...	...	.	..	12	51
7	,, 17th	...	26	17	...	...	12	...	...	...	...	14	69
8	,, 24th	...	18	9	1	...	16	...	...	3	...	12	59
9	March 3rd	...	23	11	...	...	10	...	...	...	...	13	57
10	,, 10th	2	31	12	...	...	11	...	...	...	...	7	63
11	,, 17th	...	33	16	2	...	8	...	...	1	...	14	74
12	,, 24th	...	15	9	2	...	15	...	...	1	...	15	57
13	,, 31st	...	19	11	1	...	15	...	...	1	...	14	61
14	April 7th	...	25	13	2	...	10	...	...	1	...	12	63
15	,, 14th	...	37	7	...	...	16	...	...	1	...	9	70
16	,, 21st	...	41	6	2	...	11	...	..	...	...	8	68
17	,, 28th	...	36	4	...	...	13	...	...	...	...	17	70
18	May 5th	...	51	13	1	...	7	...	...	1	...	15	88
19	,, 12th	...	41	8	1	...	5	...	...	1	...	11	67
20	,, 19th	...	47	10	4	...	14	...	...	2	...	10	87
21	,, 26th	..	38	12	1	..	19	..	...	2	...	16	88
22	June 2nd	...	46	17	...	...	11	...	...	3	...	5	82
23	,, 9th	...	28	8	...	...	6	...	...	...	...	7	49
24	,, 16th	...	23	7	...	...	9	...	...	1	...	7	47
25	,, 23rd	...	46	9	1	...	4	...	...	2	..	7	69
26	,, 30th	...	31	9	...	...	5	...	...	1	...	6	52
27	July 7th	...	52	6	2	...	8	...	...	...	...	8	76
28	,, 14th	...	50	10	...	...	10	...	...	...	...	10	80
29	,, 21st	...	67	8	1	...	6	...	...	...	..	12	94
30	,, 28th	...	51	10	..	...	6	...	...	...	...	13	80
31	August 4th	...	32	13	...	...	7	...	...	1	...	9	62
32	,, 11th	..	39	4	2	...	8	...	...	...	...	9	62
33	,, 18th	...	51	11	1	...	10	..	...	1	...	11	85
34	,, 25th	...	59	10	1	...	13	...	...	1	...	12	96
35	September 1st	...	25	4	...	...	12	...	...	1	...	7	49
36	,, 8th	...	45	7	1	...	12	...	...	1	...	22	88
37	,, 15th	...	45	10	1	...	25	...	...	...	...	15	96
38	,, 22nd	...	41	11	...	...	18	...	...	1	...	8	79
39	,, 29th	...	45	9	1	...	13	...	...	...	...	7	75
40	October 6th	...	46	8	...	...	10	...	...	1	...	8	73
41	,, 13th	...	52	10	...	...	24		...	1	...	13	100
42	,, 20th	...	56	23	2	...	23	...	...	...	...	14	118
43	,, 27th	...	57	24	...	...	30	..	...	2	...	13	126
44	November 3rd	...	68	7	1	...	32	...	...	1	...	18	127
45	,, 10th	...	80	4	1	...	25	...	...	2	...	24	136
46	,, 17th	...	60	6	...	...	36	...	...	2	...	19	123
47	,, 24th	...	37	7	2	...	42	...	...	...	..	23	111
48	December 1st	...	51	8	2	...	31	..	...	1	...	21	114
49	,, 8th	...	32	11	1	...	36	...	...	...	...	22	102
50	,, 15th	...	46	9	..	...	35	...	...	2	...	28	120
51	,, 22nd	...	41	11	...	...	33	...	...	...	...	22	107
52	,, 29th	...	41	1	3	...	16	...	...	...	...	9	70
	TOTALS ...	2	2063	500	42	...	851	1	...	39	...	678	4176

Cases removed to City Hospital :—Smallpox, 0 ; Scarlet Fever, 1,814.

TABLE VIII.

Cases of Infectious Disease Notified during the Year ending December 29th, 1900.

Classified according to Ages, Wards, and Institutions.

DISEASES.	AGES.								WARDS.																	Institutions.	CITY.
	0 to 1.	1 to 5.	5 to 10.	10 to 15.	15 to 25.	25 to 45.	45 to 65.	65 and up.	Rotton Park.	All Saints'.	Ladywood.	St. Paul's.	St. George's.	St. Stephen's.	St. Mary's.	St. Bartholomew's.	Market Hall.	St. Thomas'.	St. Martin's.	Edgbaston and Harborne.	Deritend.	Bordesley.	Duddeston.	Nechells.	Balsall Heath.	Saltley.		
SMALLPOX	...	...	...	1	1	...	...	...	..	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	2
SCARLET FEVER ...	36	669	814	267	192	81	4	...	167	168	107	23	112	55	29	141	17	58	137	66	122	273	59	164	139	197	29	2063
DIPHTHERIA	7	135	85	86	99	74	13	1	61	31	68	5	36	15	4	17	6	14	16	28	25	47	15	29	35	13	35	500
MEMBRANOUS CROUP	7	28	7	...	...	...	...	...	1	2	...	2	3	5	...	2	1	1	2	1	6	2	4	7	2	1	...	42
TYPHUS FEVER ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TYPHOID FEVER ...	2	53	99	96	285	272	41	3	84	62	53	33	42	70	38	46	19	35	25	18	40	60	76	75	27	29	19	851
SIMPLE CONTINUED FEVER	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1
RELAPSING FEVER ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
PUERPERAL FEVER ...	...	...	...	...	18	21	...	...	6	1	2	1	1	1	1	1	1	3	5	...	4	1	3	1	2	3	2	39
CHOLERA	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...
ERYSIPELAS	23	39	33	29	85	220	183	66	82	45	55	19	20	31	32	56	12	30	36	25	33	48	35	29	21	44	25	678
TOTALS ...	75	925	1038	479	680	668	241	70	401	309	285	83	214	177	104	263	56	141	221	140	230	432	192	305	226	287	110	4176

TABLE IX.

CASES OF INFECTIOUS DISEASE NOTIFIED DURING EACH OF THE NINE YEARS, 1892—1900.

	1892.	1893.	1894.	1895.	1896.*	1897.	1898.	1899.	1900.	Average of five years, prior to 1900.
SMALLPOX	27	979	2,074	100	14	0	0	0	2	23
SCARLET FEVER ...	1,418	1,614	1,788	2,964	3,389	1,929	1,320	1,255	2,063	2,171
DIPHTHERIA	456	322	316	640	1,100	655	650	665	500	742
MEMBRANOUS CROUP	77	65	90	101	94	58	39	55	42	69
TYPHUS FEVER ..	0	4	0	0	0	1	0	0	0	0
TYPHOID FEVER ...	260	489	511	436	483	533	637	779	851	574
SIMPLE CONTINUED FEVER	5	25	7	4	6	1	12	13	1	7
RELAPSING FEVER ...	1	0	0	0	1	0	0	0	0	0
PUERPERAL FEVER ...	40	54	42	24	31	17	24	30	39	25
CHOLERA	0	0	0	0	0	0	0	0	0	0
ERYSIPELAS	569	852	772	818	782	585	637	629	678	690
TOTAL ...	2,853	4,404	5,600	5,087	5,900	3,779	3,319	3,426	4,176	4,302

* 53 weeks.

TABLE X.

TEMPERATURE OF THE AIR AND GROUND, RAINFALL, SUNSHINE, AND WIND, IN EACH MONTH OF THE YEAR 1900.

Observed at the Birmingham and Midland Institute Observatory, Edgbaston, by Mr. Alfred Cresswell.

MONTH.	TEMPERATURE OF THE AIR.						TEMPERATURE OF THE GROUND.		HOURS OF SUNSHINE.		RAINFALL IN INCHES.		DAYS ON WHICH RAIN FELL.	MILES OF WIND.	
	Highest in the shade.		Lowest in the shade.		Mean for the Month.		Highest 1 foot deep.	Highest 4 feet deep.							
	1900.	Above or below the previous highest. *	1900.	Above or below the previous lowest. *	1900.	Above or below the average. *			1900.	Above or below the average. *	1900.	Above or below the average. *		1900.	Above or below the average. *
JANUARY ...	53·5	− 4·5	30·6	+19·8	38·8	+ 2·0	43·1	45·6	27	− 9	3·53	+ 1·73	21	9850	− 113
FEBRUARY ...	53·3	− 8·6	17·7	+ 9·7	35·5	− 2·2	44·1	44·6	47	− 10	4·28	+ 3·02	18	9433	+ 150
MARCH ...	52·2	−12 6	24·0	+ 2·7	37·0	− 3·3	41·4	43·3	47	− 46	0·70	− 0 91	8	9196	−1128
APRIL ...	72·6	− 6·4	28·9	+ 1·9	46·8	+ 1·8	50·2	45·8	118	+ 7	0·92	− 0·40	10	8886	− 204
MAY	65·1	−12 5	35·1	+ 4·1	49·7	− 1·3	51·7	47·7	103	− 39	2·09	+ 0·08	7	9983	+ 869
JUNE	78·9	− 3·9	44·3	+ 6·0	57·4	− 0·4	58·0	51·5	150	− 2	2·41	+ 0·34	17	8999	+1185
JULY	86·5	+ 1·9	46·8	+ 7·3	63·9	+ 4·4	64·5	55·9	203	+ 68	1·74	− 0·37	10	7770	− 773
AUGUST ...	79·0	− 6·6	48·0	+ 6·8	58·7	− 0·3	59·6	55·9	117	− 18	2·89	+ 0·12	13	8607	− 84
SEPTEMBER ...	70·6	−12·2	42·9	+ 9·9	56·2	+ 0·9	57·8	55·0	119	+ 4	0·80	− 1·17	8	7002	−1254
OCTOBER ...	67·0	− 3·0	33 1	+ 5·2	48·7	+ 1·6	53·7	54·3	83	+ 11	3·08	+ 0·54	18	10246	+1390
NOVEMRER ...	59·4	− 2·2	31·8	+ 8·3	44·2	+ 1·1	50·9	51·2	43	+ 7	2·40	+ 0·13	20	8729	− 716
DECEMBER ..	55·4	− 0·6	27·0	+12·5	43·7	+ 5·6	48·8	48·6	29	− 3	4·25	+ 2·05	16	12155	+2123

* In the thirteen years 1887-1899.

TABLE XI.

Temperature and Rainfall in each Month and Year from 1887 to 1900.

MONTH.	TEMPERATURE.											
	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899	Average for 13 years 1887-1899	1900
	°	°	°	°	°	°	°	°	°	°	°	°
January ...	41·1	34·4	35·2	35·1	36·7	30·6	39·9	33·7	42·2	40·2	36·8	38·8
February	36·8	40·2	37·3	39·2	39·9	27·5	39·1	41·5	38·9	39·8	37·7	35·5
March ...	42·6	38·8	35·6	45·3	42·6	40·4	43·5	42·8	38·1	40·1	40·3	37·0
April ...	44·0	42·4	44·9	49·6	48·5	45·5	47·6	43·5	46·0	45·4	45·0	46·8
May ...	52·7	48·4	53·2	54·5	47·1	53·9	52·9	49·8	49·0	49·1	51·0	49·7
June ...	57·1	57·4	56·5	59·0	55·6	58·0	60·7	58·4	55·7	58·8	57·8	57·4
July ...	57·6	58·0	56·8	61·0	59·8	58·5	61·1	61·0	58·8	62·3	59·5	63·9
August ...	57·5	56·9	59·2	63·2	56·4	59·2	56·8	60·1	57·9	63·6	59·0	58·7
September	58·6	57·2	54·0	54·8	52·1	59·9	54·4	52·9	58·2	55·4	55·3	56·2
October ...	49·2	48·4	44·5	48·8	47·2	44·8	43·3	49·1	51·0	47·7	47·1	48·7
November	42·5	41·3	43·2	39·9	45·1	44·6	38·9	44·6	43·8	46·6	43·1	44·2
December	29·8	39·2	34·7	39·5	40·1	38·0	38·1	39·8	44·4	35·7	38·1	43·7
Year ...	47·5	46·9	46·3	49·2	47·6	46·7	48·0	48·1	48·7	48·7	47·6	48·4

MONTH.	RAINFALL.											
	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899	Average for 13 years 1887-1899	1900
January ...	2·80	1·92	1·98	1·75	1·61	3·92	1·15	1·89	0·83	3·44	1·80	3·53
February	0·52	0·69	1·41	2·56	2·05	0·32	0·56	2·54	1·47	1·99	1·26	4·28
March ..	1·47	1·22	0·85	0·50	1·05	1·91	2·68	3·14	0·63	1·02	1·61	0·70
April ...	0·69	2·13	1·23	0·33	1·62	2·37	1·33	2·02	1·85	2·40	1·32	0·92
May ...	2·12	3·38	1.85	2·08	2·01	0·82	0·21	1·20	2·62	2·20	2·01	2·09
June ...	1·62	3·27	2·74	1·08	2·16	0·89	1·91	4·13	1·06	3·28	2·07	2·41
July ...	2·39	2·08	2·52	1·64	3·36	3·25	1·25	0·95	1·29	1·10	2·11	1·74
August ...	3·74	3.56	3·73	2·25	2·12	2·75	1·74	3·81	2·57	1·08	2·77	2·89
September	1·26	1·63	2·97	1·72	1·70	0·45	4·34	2·48	0·64	2·80	1·97	0·80
October ...	1·56	5·36	2·84	2·45	3·48	2·81	2·50	1·31	2·74	2·37	2·54	3·08
November	3·22	2·74	1·79	1·38	2·48	3·41	1·26	1·96	2·51	1·49	2·27	2·40
December	0·71	3·16	1·69	3·02	1·88	1·99	3·34	2·78	2·24	1·95	2·20	4·25
Year ...	22·10	31·14	25·60	20·76	25·52	24·89	22·27	28·21	20·45	25·12	23·93	29·09

TABLE XII.

SUMMARY OF NUISANCES ABATED AND OTHER WORK DONE DURING THE YEAR 1900.

(RETURNS MADE BY MR. PARKER, *Inspector of Nuisances.*)

DWELLING HOUSES.

No. of Houses cleansed (walls and ceilings)	2,188
,, Houses cleansed (floors, bedding, &c.)	23
,, Houses repaired	2,240
,, Houses closed under the Housing of the Working Classes Act	5
,, Houses demolished under the Housing of the Working Classes Act	0
,, Houses put in habitable condition under the Housing of the Working Classes Act	19
,, Houses re-opened on rescinding order under the Housing of the Working Classes Act	0
,, Houses closed under the Public Health Act	88
,, Houses demolished under the Public Health Act ...	34
,, Houses put in habitable condition under the Public Health Act	32
,, Houses provided with better ventilation	64
,, Cases of overcrowding remedied	75
,, Accumulations of water in cellars removed	349
,, Rain-water Spouts repaired	581

CLOSETS.

No. of Ashpit Privies converted to water closets	858
,, Pan Privies converted to water closets	275
,, Privies and Closets limewashed	540
,, Pan Privies cleansed by Staff	90,656
,, Tub Sheds cleansed by Staff	61,693
,, Water Closets repaired	736
,, Pan Privies repaired	339
,, Ash Sheds repaired	259
,, Additional Water Closets provided	110
,, Additional Ash Tubs provided	530
,, Soilpipes removed from inside houses	8
,, Urinals repaired or reconstructed	198

DRAINAGE.

No. of Drains relaid or repaired	490
,, Drains opened and cleansed	2,974
,, Drains efficiently trapped	1,834
,, Drains in cellars disconnected from the sewer or abolished	106
,, Sink Drains disconnected from the sewer	79
,, Sink Bend Pipes repaired or affixed	296
,, Premises supplied with additional drains	125
,, Smoke Tests applied to drains	65
,, Defects discovered thereby	241
,, Drains in Stables removed	42
,, Drain Traps cleansed by the Staff	141,737
,, Surface Drains cleansed by the Staff	72,468

OTHER NUISANCES ABATED AND WORK DONE.

No. of Back Yards paved	245
,, Back Yards repaired	425
,, Courts cleansed by Staff	2,751
,, Wash-houses repaired	194
,, Premises from which fowls have been removed	196
,, Nuisances from swine and swine styes abated	41
,, Accumulations of wash, manure, etc., removed	551
,, Dangerous Premises reported to the City Surveyor's Department...	798
,, Defective Water Fittings reported to the Water Department	759
,, Premises supplied with Corporation Water	2
,, Disused Wells filled up	8
,, Manure Receptacles provided	27
,, Over-flow Pipes disconnected from drains	40
,, Other Nuisances abated	5

DISINFECTION.

No. of Houses disinfected after Smallpox	1
,, ,, ,, ,, Scarlet Fever	1,649
,, ,, ,, ,, Diphtheria and Croup	233
,, ,, ,, ,, Typhoid Fever	522
,, ,, ,, ,, Puerperal Fever	24
,, ,, ,, ,, Consumption	1
,, ,, ,, ,, Measles	28
,, Beds and Mattresses disinfected	3,662
,, Sheets, Blankets, and Counterpanes disinfected	7,498
,, Pillows and Bolsters disinfected	5,788
,, Garments disinfected	8,334
,, Carpets disinfected	418
,, Other Articles disinfected	1,462

SMOKE NUISANCES.

No. of Observations made by the Inspectors	9,358
,, Manufacturers Reported for breaking the regulations ...	125

LODGING HOUSES.

No. of Visits by day	12,167
,, Visits by night	999
,, Persons found occupying the houses	20,992
,, Contraventions remedied	4
,, Keepers summoned	4

CANAL BOATS

No. of Boats registered	25
,, Boats inspected	846
,, Contraventions remedied	78

WORKSHOPS.

No. of Visits to Workshops	12,064
,, Workshops limewashed	1,795
,, Sanitary defects remedied	1,650

DAIRIES, COW SHEDS, AND MILK SHOPS.

No. of Visits to Dairies	612
,, Visits to Cow Sheds	735
,, Visits to Milk Shops and Milk Stores	11,740
,, Contraventions remedied	2,787

BAKEHOUSES.

No. of Visits to Bakehouses	1,033
,, Bakehouses limewashed	112
,, Sanitary Defects remedied	4

UNWHOLESOME FOOD.

(*Return made by* Mr. Edwards, *Superintendent of the Markets.*)

Voluntary Surrenders of Bad Meat...	1,512
Seizures of Bad Meat	23
Weight Destroyed	...216 tons
Voluntary Surrenders of Bad Fish, etc.	492
Seizures of Bad Fish, etc.	5
Weight destroyed	56 tons
Weight of Bad Fruit, etc., destroyed	69 tons

CONTAGIOUS DISEASES (ANIMALS) ACT.

(*Return made by* Mr. Edwards, *Superintendent of the Markets.*)

No. of Visits to Slaughter Houses	9,874
,, ,, Railway Stations	1,024
,, ,, Cow Houses	29

TABLE XIII.

RETURN FOR THE PERIOD 1ST JULY, 1899, TO 30TH JUNE, 1900, RESPECTING THE VACCINATION OF CHILDREN WHOSE BIRTHS WERE REGISTERED IN THE CITY DURING THE SAID PERIOD.

	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. :				Exempt through Conscientious Objection.	Number of these Births which remained unentered in the "Vaccination Register" on account (as shown by Report Book) of			Number of these Births remaining neither duly entered in the "Vaccination Register" (cols. 3, 4, 5, and 6 of this Return) nor temporarily accounted for in the "Report Book" (cols. 8, 9, and 10 of this Return).
		Col. 10.	Col. 11.		Col. 13					
		"Successfully Vaccinated."	"Insusceptible of Vaccination."	"Had Smallpox."	"Dead Unvaccinated."		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
Birmingham Parish ...	8,378	5,390	30	—	1,370	24	100	123	878	463
Aston Union (within the City)	7,216	4,832	49	—	1,058	35	138	141	452	511
King's Norton Union (within the City) ...	1,878	1,449	19	—	160	18	29	30	107	66
Total	17,472	11,671	98	—	2,588	77	267	294	1,437	1,040

TABLE XIV.—WATER: RESULTS OF ANALYSIS EXPRESSED IN PARTS PER 100,000.

Date of Receipt of Sample.	DESCRIPTION.	Temperature, C.	Total Solid Matter.	Organic Nitrogen.	Albuminoid or Organic Ammonia.	Free Ammonia.	Nitrogen as Nitrates and Nitrites.	Oxygen Absorbed in 4 Hours, at 27°C. (80° F.)	Previous Sewage Contamination (Estimated).	Chlorine.	Hardness.			REMARK
											Temporary.	Permanent.	Total.	
1900.	**CORPORATION SUPPLY.**													
Jan. 11th	15 Court, Ashley Street ...	3°9	31·6	·07	·016	·000	·10	·18	700	2·0	9°0	12°0	21°0	Clear: pale green.
Feb. 15th	5 Court, Great Charles Street...	2·8	35·2	·02	·009	·000	·20	·08	1,700	3·2	9·0	12·5	21·5	Very slightly turbid: pale green.
Mar. 21st	Rear of 39 and 41 Cuthbert Road	6·1	33·2	03	·008	·000	·25	·13	2,200	2·1	5·0	10·5	15·5	Clear: pale green.
April 5th	17 Court, Bordesley Street ...	5·6	30·4	·02	016	·000	·20	·12	1,700	2·0	8·5	13·0	21·5	Clear: pale green.
May 7th	18 Court, Moland Street ...	11·1	30·0	·03	005	·000	·30	·08	2,700	2·8	8·5	10·5	19 0	Clear: pale green.
June 7th	Woodbine Terrace, Waterworks Road	15·5	34·8	·02	·005	·000	·20	·12	1,700	2·9	8·5	13 5	22·0	Clear: pale green.
July 5th	Back of 26 and 27 Gt. Francis Street	16·7	34·8	·03	·012	·000	·10	·17	700	1 9	11·5	13·5	25 0	Very slightly turbid: pale green.
Aug. 9th	22 Court, Great Colmore Street	15·8	35 6	·03	·009	000	·25	·11	2,200	2 9	7·0	15·0	22 0	Ditto.
Sept. 10th	2 Serpentine Road, and 267 High Street, Harborne ...	15 3	33·2	·03	·009	·000	·20	·11	1,700	2·6	6·0	14·0	20 0	Ditto.
Oct. 8th	3 Malvern Hill Road	12·8	22·8	·04	·010	·001	·10	14	700	2 0	5·5	9 0	14·5	Clear: pale green.
Nov. 7th	Rear of 91 Upper Highgate Street	10·8	32·8	02	·010	·001	·20	·16	1,700	2·3	8·5	14·0	22·5	Very slightly turbid: pale green.
Dec. 5th	40 Court, Grosvenor Street West	8·6	32·0	·01	·007	·000	·25	·14	2,200	2 5	9 0	12·0	21·0	Clear: pale green.
	Average Results ...1900	10·4	32·2	·03	·010	·000	·20	·13	1,660	2·4	8·0	12 5	20·5	
	,, ,, ...1899	11·3	31·8	·03	011	·001	·22	·14	1 850	2·4	6·3	12·9	19 2	
	,, ,, ...1898	11·2	32·2	·04	·010	001	·27	·10	2,350	2·3	7 5	14·2	21·7	
	,, ,, .. 1897	10·4	32·0	·04	011	·000	·28		2,480	2·3	8·9	13 0	21·9	
	,, ,, ...1896	10·7	32·0	·04	012	·001	·29		2,550	2·4	9 0	13·0	22·0	

WELL WATERS.

Jan.	2nd	210 and 212 Belgrave Road ...	...	240·0	...	·019	·111	10·50	·22	104,680	14·5	...	...	200·0	Clear; pale green.
Feb.	5th	Belgrave House, Blake Lane ...	...	155·0	...	·030	·001	7·40	·18	74,000	8·5	...	...	94·0	Very slightly turbid; greenish grey.
,,	5th	55 Stanmore Road	...	64·0	...	·009	·040	1·60	09	16,000	5·7	...	...	40·0	Very turbid; grey.
Mar.	20th	*23 and 24 Lloyd Street ...	...	144·0	...	·010	·001	6·51	·12	65,000	7·5	...	...	110·0	Clear; pale green.
,,	27th	†7 to 12 Haden Street	...	199·0	...	·007	·001	10·70	·12	107,000	16·8	...	...	150·0	Very slightly turbid; pale green.
April	23rd	†48 and 50 Serpentine Road, Harborne	..	137·0	..	·009	·300	9·6	·06	98,000	12·0	...	...	80·0	Very slightly turbid; grey.
,,	23rd	118 Yardley Road	...	150·0	...	·006	·000	0·8	·10	80,000	11·6	...	...	102 0	Ditto.
June	29th	36 to 40 Vincent Street and 20 and 22 Hampden Street	...	170·0	...	·005	·000	4·4	·07	44,000	13·2	...	...	155·0	Very slightly turbid; pale green.
Sept.	4th	†Masshouse Cottages, Harrison's Road	...	40·0	...	·002	·001	2·5	·06	25,000	3·6	...	...	18·0	Very slightly turbid; pale green.
,,	19th	§94 Inkerman Street	...	200·0	...	·004	·000	8·2	·16	82,000	14·8	...	...	118·5	Clear; blue.
Dec.	19th	§200 Bristol Road	...	84·0	...	·007	·000	3·30	·03	33,000	5·7	...	...	49·0	Very slightly turbid; green.

* Scarlet Fever. † Diphtheria. § Typhoid Fever.

TABLE VIII.

Number of Deaths in each Street in the City of Birmingham during the Year. 1900.

STREETS.	Zymotic Diseases.	Other Diseases.
A		
A B Row		
Abberley Street		3
Abbey Road		
Abbey Street	2	5
Abbotsford Road		
Aberdeen Street	4	13
Ada Street		
Adams Street	6	36
Adderley Road	2	23
Adderley Street	3	12
Addison Road		
Adelaide Street	2	12
Albany Road		
Albert Road		
Albert Street		
Albion Street	1	5
Alcester Street	5	17
Alder Drive		
Alder Road		2
Alexandra Road		2
Alexandra Street	1	7
Alfred Street	3	5
Algernon Road		3
Allcock Street	4	9
Allen's Road	1	4
Allesley Street		11
Allison Street	2	35
All Saints' Road	1	2
All Saints' Street		3
Alma Crescent	1	11
Alma Street		
Alston Street	2	11
Alum Rock Road	1	19
Ampton Road		1
Anderton Road		10
Anderton Street	3	12
Anderton Park Road		
Andover Street		
Angelina Street	13	32
Annandale Road		
Anthony Road		1
Arden Road	1	7
Argyle Street	7	8
Arley Road	1	5
Armoury Road	1	9
Arsenal Street		4
Arter Street	2	1
Arthur Place		
Arthur Road		
Arthur Street	6	45
Artillery Street		5
Ash Road		10
Ashfield Road	1	1
Ashford Street	2	2
Ashley Street	3	28
Ashted Row	1	27
Aston Road	4	31
Aston Street	1	3
Aston Brook Street	3	10
Aston Church Road	2	12
Asylum Road	1	10
Athole Street		1
Atlas Road		2
Auckland Road	2	5
Augusta Street		2
Augustus Road		
Austin Street		4
Avenue Road		1
Avery Road		2
B		
Bacchus Road	5	7
Bagot Street	5	18
Bailey Street		
Baker Street	2	12
Balden Road		1
Balfour Street		3
Balsall Heath Road	2	33
Banbury Street	1	6
Banks Road	1	3
Barford Road	2	13
Barford Street	9	41
Barker Street	1	3
Barlow's Road		
Barn Street		12
Barnsley Road		
Barr Street	3	30
Barrack Street		1
Barrows Road		9
Bartholomew Row	1	
Bartholomew Street	1	13
Barwell Road	1	1
Barwick Street		
Bath Passage		
Bath Row	2	11
Bath Street	1	2
Beach Street	6	19
Beaconsfield Road		2
Beak Street		6
Beaufort Road		4
Bedford Road		3
Beech Lanes		2
Beechfield Road	1	2
Belchers Lane		
Belgrave Road	3	37
Bellbarn Road	4	57
Bellefield Road		4
Bell Street		
Bellis Street	1	8
Belmont Passage		3
Belmont Row		11
Benacre Street	3	12
Bennett's Hill		1
Bennett's Road		
Benson Road	1	9
Berkley Street	1	1
Berners Street	2	3
Berry Road		4
Berry Street		2
Bertram Road	1	
Betholom Row		1
Birchall Street		5
Birchwood Crescent		1
Birchwood Road		2
Bishop Street	5	26
Bishopsgate Street	7	24
Bissell Street	2	20
Black Pit Lane		
Blake Lane		4
Blakeland Street	1	8
Blews Street	1	12
Bloomsbury Street	3	18
Blucher Street	5	13
Blythe Street	3	21
Bolton Road	11	43
Bolton Street		1
Bond Street		
Bordesley Green	2	26
Bordesley Street	2	19
Bordesley Green Road	2	4
Bordesley Park Road	6	19
Bow Street	1	10
Bowyer Road		5
Bowyer Street		1
Bracebridge Street	5	20
Bradford Street	5	23
Braithwaite Road		3
Branston Street		11
Brass Street	3	7
Brasshouse Passage		1
Brearley Street	12	49
Brewery Street		4
Brickiln Street		
Bridge Road		8
Bridge Street		
Bridge Street West	12	46
Brighton Road		10
Bristol Road		7
Bristol Street		9
Brixham Road		3
Broad Street	1	16
Bromford Lane		
Bromley Street		4
Bromsgrove Street	2	25
Brook Road		
Brook Street		
Brookfield Road	2	6
Broom Street		
Browning Street		8
Brueton Street		1
Brunswick Road	7	30
Buck Street		2
Buckingham Street	2	20
Bull Ring		6
Bull Street, Harborne		3
Bull Street, Market Hall		
Bullock Street	1	9
Burbury Street	2	10
Burlington Road	1	1
Burney Lane		
Butler Street		2
Butler Street South	1	
Butlin Street		2
Byron Road		10
C		
Calthorpe Road		3
Cambridge Crescent	1	1
Cambridge Street	1	2
Camden Drive		1
Camden Grove		2
Camden Street	3	52
Camp Hill	3	15
Camp Street	2	4
Canal Street		10
Cannon Street		
Cannon Hill Road		1
Cape Street		3
Cardigan Street	1	13
Carlisle Street	5	13
Carlton Road		10
Carlyle Road		2
Carnarvon Road		
Caroline Street	2	1
Carpenter Road		2
Carrington Road	3	13
Carrs Lane		
Cartland Road	1	1
Carver Street	1	16
Castle Street		
Cathcart Street		5
Cato Street		17
Cato Street North	1	3
Cattell Road	1	22
Cattell's Grove		6
Cavendish Road		4
Cecil Street	4	30
Cemetery Lane		1
Chad Road		
Chandos Road		2
Chapel Street		6
Chapel House Street		
Chapman Road		
Charles Road	1	16
Charles Arthur Street	3	11
Charles Henry Street	12	34
Charlotte Road		1
Charlotte Street		5
Chattaway Street		2

NOTE.—Deaths in hospitals, workhouses, asylums, and other public places have been referred as far as possible to the streets in which the deceased persons had resided.

STREETS.	Zymotic Diseases.	Other Diseases.
Cheapside	4	44
Cheatham Street		2
Chequers Walk		3
Cherry Street		1
Cherrywood Road	1	17
Chester Street	4	6
Chesterton Road	2	3
Cheston Road		
Chicheley Street		6
Chiswell Road	1	7
Church Road		1
Church Street		2
City Road		9
Claremont Road		4
Clarence Road		4
Clarendon Road		7
Clark Street	2	26
Claverdon Street	1	5
Claybrook Street		3
Clayton Road		4
Clement Street	2	4
Cleve Terrace		1
Clevedon Road	3	10
Clifton Road	1	30
Clissold Street	1	6
Cliveland Street	1	3
Clodeshall Road		3
Clyde Street	1	2
Coleman Street	3	24
Coleshill Street		21
College Road		6
College Street	2	8
Colmore Row		
Colville Road	1	7
Commercial Street		
Common Lane		
Communication Row	3	8
Congreve Street		2
Constance Road		
Constitution Hill		6
Conway Road		
Conybere Street	3	19
Cook Street	1	9
Cooksey Road	11	37
Cope Street	2	9
Coplow Street	2	12
Coralie Street		4
Cornwall Street		1
Coronation Road		
Corporation Street		3
Cotterill's Lane		1
Couchman Road		3
Court Road		1
Court Oak Road		4
Coventry Road	2	43
Coventry Street	1	17
Cowper Street	6	22
Cox Street	1	6
Cox Street West		14
Coxwell Road	1	2
Crabtree Road		14
Cradock Road	1	3
Cranbury Street	1	
Cranby Street	1	7
Cranemore Street	4	2
Crawford Street		10
Cregoe Street	1	12
Crescent		5
Cromer Road		1
Crompton Road		3
Cromwell Street	5	44
Crosbee Road		
Cuckoo Road	1	11
Cumberland Street		3
Curzon Street	2	3
Cuthbert Road		9
Cyril Road	1	1
D		
Daisy Road		2
Dale End		6
Dallwood Road		
Dalton Street		
Darnley Road		
Dart Street	2	2
Dartmouth Street	7	19
Darwin Street	7	33
Dawson Street		2
Dean Street	1	3
Dearman Road		2
Defford Road	1	5
Denbigh Street		5
Dennis Road		1
Derby Street	2	6
Devon Street	7	30
Devonshire Street	6	12
Digbeth	1	26
Digby Street		2
Dixon Road	1	4
Doe Street		5
Dolman Street		23
Dolobran Road	2	5
Don Street	1	11
Dora Road		2
Dorset Road		
Dover Street		2
Drayton Road		1
Drew's Lane		
Drury Lane		3
Dryden Road		
Duchess Road		3
Duddeston Row		10
Duddeston Mill Road	7	29
Dudley Road	3	11
Dudley Street	1	1
Dugdale Street	2	10
Duke Street	4	8
Dymoke Street	2	18
E		
Earl Street		1
Eastern Road		
Easy Row		
Edgbaston Road		1
Edgbaston Street		2
Edgbaston Park Road		1
Edmond Road		1
Edmund Street		6
Edward Road	5	24
Edward Street	3	17
Eldon Road		
Eliot Street	1	12
Elkington Street		6
Ellen Street	1	11
Ellis Street	1	6
Elm Tree Road		
Elvetham Road		
Emerson Road		3
Emily Street	7	29
Emmeline Street		
Enfield Road		
Erasmus Road	1	9
Ernest Street		
Ernest Road		1
Erskine Street	4	6
Essex Street	2	6
Essington Street	1	10
Ethel Road		
Ethel Street		
Eton Road		2
Eva Road	1	12
Eversley Road	1	10
Exeter Street		1
Eyre Street		11
F		
Factory Road		5
Falconer Road		1
Fallows Road		8
Farm Road		2
Farm Street	10	60
Farquhar Road		1
Farquhar Road East		
Fawdry Street		2
Fazeley Street	2	8
Fellows Lane		
Finsbury Road		
Fisher Street	1	6
Floodgate Street	1	6
Florence Street		8
Floyer Road		1
Ford Street	1	24
Fordrough Lane		
Forster Street	3	3
Foundry Road	2	8
Fountain Road		
Fowler Street		
Fox Street		10
Francis Road		1
Francis Street	5	30
Frank Street	1	7
Frankfort Street	2	8
Franklin Street	1	4
Frederick Road		6
Frederick Street	2	2
Freeman Road		4
Freeman Street		2
Freeth Street		20
Friston Street	1	12
G		
Galton Street		8
Garbett Street	13	19
Garrison Lane	3	45
Garrison Street	5	15
Gas Street		
Gate Street	1	4
Geach Street		9
Gee Street	1	6
Gem Street	1	9
George Road		5
George St., Balsall H'th.		5
George Street, St. Paul's		10
George Street West	3	21
Gibb Street		1
Gillhurst Lane		
Gillott Road		15
Gladstone Road	1	3
Glebe Street		5
Gloucester Street		
Glover Street	4	18
Glover's Road	1	7
Godwin Street		3
Golden Hillock Road	1	10
Gooch Street	4	18
Goode Street		7
Goodrick Street		9
Gopsall Street		2
Gordon Road		8
Gordon Street	1	6
Gosford Street		3
Gosta Green		3
Gough Road		10
Gough Street		9
Grace Road	5	10
Grafton Road		3
Graham Street		8
Grange Road	3	17
Grant Street		6
Grantham Road		2
Granville Street	1	9
Gray Street		2
Gray's Road	1	2
Great Barr Street	3	16
Great Brook Street	2	23
Great Charles Street	1	4
Great Colmore Street	3	36
Great Francis Street	13	43
Great Hampton Row	3	25
Great Hampton Street	4	9
Great King Street	8	29
Great Lister Street	4	37
Great Russell Street	10	44
Great Tindal Street	3	9
Green Lane	7	32

STREETS.	Zymotic Diseases.	Other Diseases.
Green Street, Deritend	2	5
Green Street, Saltley		2
Greenfield Crescent		1
Greenfield Road		11
Greenway Street	5	15
Grosvenor Road		1
Grosvenor Street		
Grosvenor Street West	1	18
Grove Lane		
Grove Street		
Guest Street	1	3
Guildford Street	2	15
Guthrie Street		
H		
Hack Street		1
Haden Street		3
Hadley Street		2
Hagley Road		18
Halberton Street	1	9
Hall Road		4
Hall Street		7
Hallam Street		4
Hampden Street		1
Hampton Street	2	13
Hams Road		
Handsworth New Road		2
Hanley Street	3	6
Hanover Street		4
Harborne Road	1	5
Harborne Park Road		3
Harding Street		4
Harford Street		5
Harold Road		1
Harris Road		
Harrison's Road		
Hart's Road		5
Hartop Road		3
Hatchett Street	4	13
Havelock Road		12
Hawkes Street		5
Hawthorn Road		
Heath Street	7	31
Heath Street South	1	2
Heath Green Road	3	4
Heath Mill Lane	1	19
Heaton Street	6	27
Helena Street		
Heneage Street	6	49
Henley Street	3	12
Henn's Walk		3
Henrietta Street		1
Henry Street	2	25
Henshaw Road	1	3
Herbert Road	4	24
Hermitage Road		
Herrick Road		8
Hertford Street		1
Hick Square		2
Hick Street	2	9
Hickman Road		1
High Street		9
High Street, Bordesley, and Deritend	2	31
High Street, Harborne	2	21
High Street, Saltley	2	11
Highfield Rd., Edgb'ton		
Highfield Road, Saltley		9
Highgate Place		3
Highgate Road	5	23
Highgate Square		
Highgate Street	8	27
High Park Street	3	3
Hill Street	2	4
Hinckley Street		1
Hingeston Street	1	14
Hobmoor Road		2
Hockley Hill	2	14
Hockley Street	3	6
Holborn Hill	2	11
Holder Road		
Holland Street	1	5
Holliday Street		16
Hollier Street		6
Holloway Head	2	17
Holly Road		
Holt Street	2	8
Homer Street	1	3
Hooper Street	1	4
Hope Street	8	30
Horse Fair		2
Hospital Street	14	80
Howard Street	1	6
Howe Street		8
Hubert Street		3
Hugh Road		6
Humpage Road		7
Hunter's Road		
Hunter's Vale		
Hurst Street	2	20
Hutton Road		3
Hyde Road		7
Hylton Street		1
I		
Icknield Square	6	7
Icknield Street	2	25
Icknield Port Road	6	41
Inge Street	1	12
Ingleby Street	1	17
Inkerman Street	3	16
Irving Street	5	42
Islington Row		10
Ivy Lane		
J		
Jakeman Road	1	4
Jakeman Walk		5
Jamaica Row		1
James Street		
James Turner Street	2	9
James Watt Street	1	2
Jenkins Street		5
Jennens Row	1	8
Jersey Road		
John Bright Street		
Johnson Street		8
Johnstone Street	1	2
K		
Keeley Street	1	
Kendal Road		1
Kenelm Road	2	6
Kent Street	2	12
Kent Street North		11
Kenyon Street	2	4
Key Hill	3	7
King Street		3
King Alfred's Place		2
King Edward's Place		
King Edward's Road	5	21
Kingscote Road		1
Kingsley Road		2
Kingston Road		3
Kingswood Road		
Kirby Road	1	1
Kitchener Street		9
Knutsford Street		1
Kyott's Lake Road		2
Kyrwick's Lane		9
L		
Ladypool Road		29
Ladywell Passage		
Ladywell Walk		
Ladywood Road	1	17
Lancaster Street	1	19
Landor Street	2	6
Langley Road		2
Lansdowne Street	2	7
Larches Street	2	7
Latimer Street	3	21
Lawden Road	1	12
Lawford Street	1	8
Lawley Street	5	22
Lawrence Street	1	7
Lawson Street		
Laxey Road		2
Leach Street		3
Leamington Road	2	3
Lease Lane		6
Ledsam Street	2	24
Lee Bank Road	2	16
Lee Crescent		2
Lee Mount		1
Leek Street		1
Lees Street	1	13
Legge Lane		2
Legge Street		19
Leigh Road		
Lench Street	1	2
Lennox Street	5	15
Leonard Street	2	1
Leopold Street	3	11
Leslie Road		
Lime Grove		2
Lincoln Street		10
Lingard Street	7	9
Link Road		1
Lionel Street		3
Lister Street	1	9
Little Ann Street	1	4
Little Barr Street	1	2
Little Bow Street		
Little Broom Street	1	
Little Edward Street	1	2
Little Francis Street		
Little Green Lane	3	29
Little King Street	1	14
Little Shadwell Street		1
Liverpool Street	5	2
Livery Street	1	2
Lloyd Street		3
Lodge Road	2	28
Lombard Street	1	4
Long Acre	10	28
Long Street	1	8
Longbridge Road		3
Longmore Street	2	3
Lonsdale Road		
Lord Street	1	14
Lordswood Road		5
Louisa Street	1	1
Love Lane		
Loveday Street		1
Lowe Street		
Lower Dartmouth Street		16
Lower Darwin Street	1	2
Lower Essex Street		10
Lower Loveday Street		5
Lower Priory		1
Lower Temple Street		
Lower Tower Street	6	30
Lower Trinity Street	3	11
Loxton Street		2
Ludgate Hill		4
Lupin Street	1	19
Lyttelton Road		1
M		
Macdonald Street	1	14
Main Street	3	7
Malins Road		
Malmesbury Road		8
Malthouse Lane	2	5
Malvern Street	1	9
Malvern Hill Road		2
Manchester Street	1	7
Manor Road		1
Mansell Road		
Margaret Road		3
Margaret Street		
Mark Lane		1

STREETS.	Zymotic Diseases.	Other Diseases.
Markby Road		13
Market Street		1
Marlborough Road	1	
Marroway Street	3	9
Marshall Street		3
Marshall Street South	1	4
Martineau Street		
Mary St., Balsall Heath	1	38
Mary Street, St. Paul's		
Mary Ann Street		
Masshouse Lane		2
Maxstoke Street		1
Meadow Road		
Medlicott Road		1
Melville Road		
Membury Road		
Meriden Street	5	17
Metchley Lane		7
Metchley Park Road		1
Metropolitan Road		
Midland Street		1
Miles Street	2	14
Milk Street	1	9
Mill Lane		10
Mill Street	2	3
Miller Street	3	28
Milton Street	1	16
Milward Street	2	8
Moat Lane		2
Moat Row		1
Moilliett Street	3	8
Moland Street	3	30
Mole Street	1	9
Mona Road	1	2
Montague Road		
Montague Street		6
Montgomery Street	2	7
Montpellier Street		2
Monument Road	3	31
Moor Street		16
Moore's Row		6
Moorsom Street	4	13
Moreton Street		4
Morville Street		14
Moseley Road	8	31
Moseley Street	5	44
Mostyn Road	1	3
Mott Street		8
Mount Pleasant	1	4
Mount Street	1	6
Muntz Street	3	6
Musgrave Road		7
Myddleton Street		
N		
Nansen Road		
Navigation Street	1	6
Nechells Place	2	6
Nechells Park Road	5	22
Needham Street		2
Needless Alley		
Nelson Street		26
New Road		2
New Street		5
New Bartholomew Street		3
New Bond Street	1	1
New Canal Street	1	11
Newdegate Street	1	2
Newhall Hill		5
Newhall Street	1	17
New John Street	3	25
New John Street West	8	52
New Market Street		
New Meeting Street		
Newport Road		4
New Spring Street	1	24
New Summer Street	4	33
Newton Street		4
Newtown Row	2	21
Niger Road	1	1
Nile Street		
Nineveh Road		1
Noel Road		3
Norfolk Road		
Norman Street	2	5
North Road	2	9
Northampton Street		1
Northbrook Street		6
Northfield Road	2	5
Northumberland Street		6
North Warwick Street		
Northwood Street	3	14
Norton Street		5
Norwood Road		2
Nova Scotia Street		6
Nursery Road		
O		
Oakfield Road		5
Oakley Road		4
Old Square		
Old Church Road		2
Old Cross Street		1
Oldfield Road	2	17
Old Meeting Street		
Oliver Road		2
Oliver Street	1	4
Ombersley Road	1	15
Oozells Street		3
Oozells Street North		2
Orchard Road	1	4
Orford Road		
Ormond Street	1	10
Osborn Road		2
Osler Street	4	21
Oughton Place		3
Owen Street	1	7
Oxford Street		10
Oxygen Street		4
P		
Paddington Street	5	15
Paignton Road	2	
Pakenham Road		
Palace Road	2	6
Palmer Street	1	9
Palmerston Road		3
Parade		4
Paradise Street		
Park Lane	3	6
Park Road	9	50
Park Street	1	20
Parkfield Road	1	
Park Hill Road	1	4
Parker Street		9
Parliament Street	3	14
Paxton Road	2	4
Pearson Street		7
Pebble Mill Road		
Peel Street	2	14
Pemberton Street		1
Pembroke Road		2
Penn Street	1	3
Percival Road		
Perrot Street		11
Pershore Road		15
Pershore Street	5	21
Phillimore Road		9
Phillip Street		
Pickford Street	1	6
Piddock Street		2
Pigott Street	2	6
Pitney Street		
Pitsford Street		3
Pitt Street		
Plough and Harrow Road		
Plume Street		
Pope Street		24
Poplar Avenue		1
Poplar Road		5
Porchester Street	1	2
Porthope Road		2
Portland Road		2
Potter Stree		2
Powell Street		4
Prescott Street	1	9
Preston Road	1	14
Price Street	5	14
Priestley Road		9
Prince Albert Street	2	4
Prince Arthur Road		7
Princes Row		1
Princes Street		5
Princess Road		11
Princip Street	1	7
Priory Road		
Pritchatt's Road		
Pritchett Street	4	31
Proctor Street		17
Prospect Row	1	2
Q		
Queen Street		6
Queen's Park Road		2
R		
Radnor Street	1	6
Raglan Road		
Railway Terrace	2	15
Ralph Road		
Rann Street		5
Ravenhurst Road		3
Ravenhurst Street	5	11
Rawlins Street	1	7
Raymond Road	1	5
Rea Street	4	30
Rea Street South		4
Redhouse Road		
Regent Parade		
Regent Place		1
Regent Road	1	5
Regent Row		2
Regent Street		
Regent Park Road		3
Reginald Road	1	11
Reservoir Retreat		1
Reservoir Road		8
Richard Street	2	21
Richmond Hill Road		
Ridley Street		5
River St., Balsall Heath	1	8
River St., St. Barthol'w's	1	4
Robert Road	1	3
Rocky Lane	3	4
Rodway Street		6
Rosalie Street		
Rose Road		1
Rosebery Street	2	7
Roshven Road		5
Rotton Park Road	2	7
Rotton Park Street		
Rowland Street		1
Runcorn Road	2	4
Rupert Street	2	12
Rushbury Road		
Russell Street		
Ruston Street	5	17
Rutland Road	1	2
Ryder Street	2	4
Ryland Road		11
Ryland Street	1	6
S		
St. Andrew's Road	6	27
St. Augustine's Road		1
St. Clement's Road	2	7
St. George's Place	2	4
St. George's Street	4	15
St. James' Place	2	3
St. James' Road		
St. James' Street	1	6
St. John's Road		
St. Luke's Road		25

STREETS.	Zymotic Diseases.	Other Diseases.
St. Margaret's Road		5
St. Mark's Street	7	24
St. Martin's Lane		
St. Martin's Place		2
St. Martin's Row		3
St. Martin's Street	1	14
St. Mary's Road		
St. Mary's Row	1	6
St. Mary's Street		8
St. Oswald's Road		1
St. Paul's Road	1	15
St. Paul's Square		1
St. Peter's Place		
St. Peter's Road		2
St. Saviour's Road	2	9
St. Stephen's Street		3
St. Vincent Street	4	13
Salisbury Road		3
Salop Street		1
Saltley Road	4	18
Saltley Street	1	5
Sampson Road	1	7
Sampson Road North	3	7
Sand Pits		4
Sand Street		3
Sandon Road		1
Sandy Lane	1	20
Sarah Street		
Scholefield Street	6	18
Scotland Street		1
Scott Street		
Sefton Road		
Selly Park Road		
Selwyn Road		
Serpentine Road		4
Severn Street	1	4
Seymour St., B'sall H'th		
Seymour St., St. Barth.		
Shadwell Street		6
Shakespeare Road	1	9
Sheep Street	1	12
Sheepcote Lane	1	1
Sheepcote Street	2	16
Shefford Road		2
Shenstone Road		4
Sherborne Street	10	29
Sherbourne Road	3	21
Sherlock Street	3	40
Sir Harry's Road	1	2
Skinner Lane		6
Skinner Street		
Sladefield Lane		
Slaney Street		1
Sloane Street	1	14
Smallbrook Street	1	3
Smith Street		16
Smithfield Passage		1
Smithfield Street		
Snow Hill	1	8
Somerset Road		3
Somerset Street		3
Somerville Road	3	3
Southfield Road		2
South Road	2	7
South Street		3
Spark Street	1	2
Speaking Stile Walk	1	
Speedwell Road		1
Spencer Street		3
Spiceal Street		
Spon Terrace		
Spooner Street	1	2
Spring Hill	3	25
Spring Hill Passage		4
Spring Road		1
Spring Street		1
Spring Vale		3
Springfield Street	3	11
Stafford Street	1	5
Stanhope Street	3	5
Staniforth Street	1	11
Stanley Road	1	1
Stanmore Road	1	
Station Avenue		
Station Road		1
Station Street		1
Stechford Lane		
Steelhouse Lane		5
Stella Street	1	1
Stephenson Place		
Stephenson Street		
Steward Street	4	15
Stirling Road		
Stoke Street	2	9
Stone Yard		2
Stoney Lane		2
Stour Street	2	15
Stratford Place		2
Stratford Road		7
Stratford Street	1	5
Strensham Road		2
Stuart Street		5
Studley Street		9
Suffolk Street		9
Summer Lane	10	56
Summer Road		13
Summer Row		3
Summerfield Crescent	1	5
Summerfield Road		
Summer Hill Road	1	5
Summer Hill Street	2	6
Summer Hill Terrace		
Sun Street	6	9
Sun Street West	1	3
Sutton Street		2
Swallow Street		1
Sydenham Road	1	13
Sydney Road	1	
T		
Talbot Street	2	15
Talfourd Street	4	21
Tarry Road		2
Taunton Road		
Taylor Street	3	2
Teall Road		5
Temple Row		
Temple Row West		
Temple Street		
Templefield Street		7
Tenby Street		2
Tenby Street North		3
Tennal Road		1
Tennal Lane		
Tennant Street	2	19
Tennyson Road		4
Theodore Street	1	4
Theresa Road		4
Thimble Mill Lane	3	14
Thomas Street		4
Thorp Street		7
Tibbitts Lane		
Tillingham Street		3
Tilton Road	2	23
Tindal Street	1	4
Tower Street	7	30
Trafalgar Road		
Treaford Lane		
Trent Street	2	3
Trevor Street	4	7
Trinity Terrace		
Tudor Street	2	8
Turner Street	2	6
Twyning Road		
U		
Unett Street	2	29
Union Passage		
Union Street		
Upper Cox Street	2	7
Upper Dean Street		3
Upper Gough Street	1	11
Upper Highgate Street	1	16
Upper Marshall Street		4
Upper Mill Lane		
Upper Priory	1	3
Upper Ryland Road	1	7
Upper Trinity Street		12
V		
Varna Road		4
Vaughton Street	2	13
Vaughton Street South	2	4
Vauxhall Grove		2
Vauxhall Road	3	28
Vauxhall Street		4
Venetia Road		4
Ventnor Road		2
Vere Street	1	7
Vernon Road		1
Vicarage Rd., Edgbaston		2
Vicarage Rd., Harborne		1
Victor Road	2	6
Victoria Grove		
Victoria Road		1
Victoria Street	1	8
Villa Street	3	6
Villiers Street	3	5
Vincent Crescent		1
Vincent Parade	1	8
Vincent Street		20
Vine Street		2
Vittoria Street	1	4
Vivian Road		8
Vyse Street		2
W		
Walford Road		11
Walter Street	4	10
War Lane		
Ward End	1	3
Ward Street	3	12
Warner Street		4
Warren Road		2
Warstone Lane	3	18
Warstone Parade East		
Warwick Street	3	16
Washington Street		3
Washwood Heath Road		18
Water Street		5
Waterloo Street		
Waterworks Road	1	7
Watery Lane	8	41
Watts Road		1
Wavell Road		1
Waverley Road	1	4
Weaman Street	2	21
Well Lane		1
Well Street	3	26
Wellesley Street	3	10
Wellington Road	1	6
Wellington Street		14
Wenman Street	4	13
Wentworth Road		1
Westbourne Road		1
Western Road		
Westfield Road		1
West Heath Road		
Westley Street	2	5
Weston Street		2
Wharf Lane		
Wharf Street	1	12
Wharton Street		4
Wheeler Street	10	16
Wheeley's Lane	1	
Wheeley's Road		8
Whitby Road		
White Road	3	15
White Street		3
Whitehall Road	1	10
Whitmore Road		10
Whitmore Street	2	14
Whittall Street		4
Wiggin Street	1	3

STREETS.	Zymotic Diseases	Other Diseases.
Willes Road	3	19
William Street	7	21
William Street North		5
William Edward Street		7
William Henry Street	1	3
Willis Street		19
Willow Avenue		
Willow Crescent		1
Willow Road	1	6
Wilton Street		4
Wimbourne Road		
Windmill Street		3
Windsor Street	5	38
Winson Street	3	9
Winson Green Road		16
Witton Street	2	10
Wolseley Street	1	10
Wood Lane	1	1
Wood Street		1
Woodbourne Road	1	
Woodcock Street	3	22
Woodfield Road	3	4
Wood Green Road		5
Woodville Road		1
Worcester Street		
Wordsworth Road	2	1
Wrentham Street	5	10
Wright Road	3	17
Wright Street		12
Wrottesley Street		
Wyndcliff Road		3
Wyndham Road		1
Wynn Street	1	14
X		
Y		
Yardley Road		2
Yateley Road		
Yew Tree Road		
York Road		3
York Street	1	4
Z		
ADDENDA.		
Not located	17	366
TOTALS	1394	9488

Grand Total - 10882

REPORT

ON

ADULTERATION.

CITY ANALYST'S LABORATORY,

THE COUNCIL HOUSE, BIRMINGHAM,

March 6th, 1901.

TO THE HEALTH COMMITTEE.

MR. CHAIRMAN AND GENTLEMEN,

I beg to report that during the year 1900 Inspector Jones purchased 1,152 samples under the provisions of the Food and Drugs Acts. Of these, 1,077 samples were submitted to me, and the remainder (obtained during the month of August) were received by my principal assistant and deputy, Mr. J. F. Liverseege, F.I.C.

In the following table the samples analysed during the last two years are divided into four classes, the adulterated articles being separated into those adulterated with preservatives only, and those adulterated in other ways :—

TABLE A.—TOTAL SAMPLES.

CLASSES.	Number analysed.		Number adulterated.			
			Preservatives only.		Other ways.	
	1899.	1900.	1899.	1900.	1899.	1900.
Samples of Food	1,027	1,048	112	129	107	97
Samples of Drink	12	37	0	0	0	2
Samples of Drugs	85	61	0	0	19	7
Samples of Margarine and Margarine-Cheese ...	7	6	0	0	7	6
Total Samples	1,131	1,152	112	129	133	112

There was a slight increase over the previous year in the number of samples of food and drink bought for analysis, but the number of samples of drugs showed a decided decrease.

Last year one sample was analysed for every 451 persons living in the City of Birmingham. In 1899 the proportions were—Birmingham, one sample for 455 persons ; London, one for 351 ; England and Wales, one sample for every 599 of the population.

Some years ago the Local Government Board considered that at least one sample of food should be analysed annually for every 1,000 of the population. In 1896 the Parliamentary Committee on Food Products Adulteration reported that "It is greatly to be desired that a proportion of samples much in excess of one sample per annum for every 1,000 of the population should be taken in the district of every local authority," and "A local authority would do well to increase the number of samples taken on their behalf from time to time, until the number of adulterated samples found in those taken falls below the proportion which may be regarded as not unsatisfactory."

The following table gives particulars of the samples analysed since 1873:—

TABLE B.—TOTAL SAMPLES.

Years.	Samples per Annum.	Persons per Sample.	Percentage of Adulteration.		Samples of Margarine per Annum.
			Preservatives only.	Other ways.	
[1]873 76	83	4,395	1	47	0
1877-81	175	2,219	1	24	0
1882-86	616	666	0	16	0
1887-91	836	507	0	12	2
1892-96	1,074	458	2	11	5
1895	1,131	439	0	11	1
1896	1,138	440	8	11	20
1897	1,145	442	11	13	17
1898	1,146	445	9	10	8
1899	1,131	455	10	11	7
1900	1,152	451	11	9	6*

* Two of the samples were unlabelled margarine-cheese.

Last year eleven per cent. of the samples were adulterated with preservatives only, being a slight increase on the two previous years. The large increase of adulteration in this way in 1896 was due to the commencement in that year of the systematic examination of all samples of milk and butter for the presence of preservatives. The percentage of adulteration in other ways than by preservatives is lower than in any year since 1886, when eight per cent. of the samples were thus adulterated.

The Report of the Local Government Board for 1899 shows that twelve per cent. of the samples analysed in London, and nine per cent. of the samples examined in England and Wales were reported to be adulterated, but no information is given as to the number of articles condemned because of the presence of preservatives.

I.—SAMPLES OF FOOD.

The following table gives a list of the articles of food received, classed as genuine and adulterated. The number of samples of margarine and margarine-cheese found to be unlabelled during exposure for sale is also indicated. The corresponding lists of articles of drink and drugs are given in Tables M and N respectively :—

Articles.	No. of Samples Analysed.		No. of Samples Adulterated.	
	Total.	Genuine.	Preservatives only.	Other ways.
Milk	359	282	29	48
Butter	287	173	95	19
Bread and Butter	22	7	5	10
Coffee	140	129	0	11
Cheese	60	60	0	0
Skimmed Cheese	1	1	0	0
White Pepper	37	37	0	0
Demerara Sugar	25	23	0	2
Arrowroot	23	23	0	0
Baking Powder	19	13	0	6
Egg Powder	15	15	0	0
Malt Vinegar	12	12	0	0
Flour	12	12	0	0
Oatmeal	11	11	0	0
Bread	8	8	0	0
Sugar Confectionery	8	8	0	0
Custard Powder	6	6	0	0
Golden Syrup	3	2	0	1
	1,048	822	129	97
Margarine	4			
Margarine-Cheese	2			
	1,054			

Milk.

Twenty-seven of the 359 samples of milk received last year contained an excess of water, thirteen samples had been deprived of part of their fat, and eight samples had been adulterated in both these ways, the total being forty-eight samples, or thirteen per cent. Six samples contained boric acid, twenty-one formic aldehyde, while in two cases both preservatives were present, thus twenty-nine samples, or eight per cent., were adulterated with preservatives only.

The number of samples of milk analysed last year was equivalent to one sample for every 1,448 persons living in Birmingham ; during 1899 one sample was analysed for each 1,165 persons, while in London the proportion for that year was one sample for 776 persons, and in England and Wales as a whole, one sample was analysed for each 1,446 persons.

TABLE D.—MILK, SKIMMED MILK, SEPARATED MILK.

Years.	Samples per Annum.	Percentage of Adulteration.		Cautions per Annum.	Prosecutions per Annum.	Fines per annum.
		Preservatives only.	Other ways.			£ s. d.
1873-76	28	—	54	0	8	5 5 0
1877-81	56	—	54	3	15	17 7 0
1882-86	184	—	31	18	28	26 4 5
1887-91	206	—	19	15	17	28 2 11
1892-96	354	—	16	24	33	38 2 5
1895	325	—	18	16	39	43 6 0
1896	470	5	14	38	49	72 13 0
1897	399	7	14	27	44	58 6 0
1898	449	9	11	20	36	46 12 6
1899	442	7	17	1	53	112 1 0
1900	359	8	13	0	39	90 2 6

The above table shows that the amount of adulteration by preservatives only has varied very little during the last four years, and that the percentage of adulteration in other ways than by preservatives last year was less than in 1899, but very similar to that of the three previous years. The amount of the fines inflicted though not so great as in the previous year was decidedly above that of any other year. The average fine has shown a steady increase ; in 1898 it was 30s., in 1899 53s., and last year it amounted to 60s.

The Report of the Local Government Board for 1899 indicates that fifteen per cent. of the samples of milk examined in London were adulterated, and ten per cent. of the number analysed in England and Wales, but no information is given as to what proportion of the samples were condemned because of the presence of preservatives.

In the next table is given the average composition of all the samples of milk examined during the last seven years. It will be noticed that in each year the percentage of fat is higher than 3·5, and that the percentage of solids not fat, with one exception, amounts to 8·5 ; the standards which I have used for the past twelve years for calculating the percentage of adulteration of sophisticated samples, and that this is in spite of the fact that all samples, even the heavily adulterated ones, are included in these averages. This shows that my standard for calculation is fair and reasonable :—

TABLE E.—AVERAGE COMPOSITION OF ALL "MILK" SAMPLES.

Year.	Total Solids, per cent.	Fat, per cent.	Solids, not Fat, per cent.
1894	12·3	3·7	8 6
1895	12·2	3·8	8·4
1896	12·2	3·7	8·5
1897	12·2	3·7	8·5
1898	12·4	3·9	8·5
1899	12·2	3·6	8·6
1900	12·2	3·7	8·5

The samples of milk may be divided into three classes according to their origin. Firstly, wholesale samples; these are taken from churns at the railway stations, or directly from farmers who do not sell milk retail. Secondly, those samples taken from persons who sell milk to smaller dealers and also do a retail trade. Thirdly, from shopkeepers who only sell in small quantities. Each quarter the Food Inspector has made a return to me, classifying the samples of milk into these three groups. The following table shows the difference in composition and in the amount of adulteration of these classes:—

TABLE F.—SOURCES OF MILK SAMPLES.

	Wholesale only.	Wholesale and Retail.	Retail only.
Number of Samples	47	41	271
Adulteration, per cent.—			
Preservatives only	0	15	9
Other ways	21	15	12
Average Composition, per cent.—			
Total Solids	11·9	12·3	12·2
Fat	3·5	3·8	3·7
Solids, not fat	8·4	8·5	8·5

The composition of the first two groups is somewhat worse than it should be owing to the comparatively small number of samples and to the influence of selection. If a sample of milk is purchased from a retail dealer which turns out to be adulterated, and the vendor maintains that the sample was sold as received, the Inspector attempts to obtain a sample from the wholesale dealer who supplied it. Therefore, a certain proportion of the samples in the first two groups are bought from wholesale dealers who are strongly suspected by the Inspector of selling adulterated milk.

It will be noticed that none of the forty-seven samples obtained from persons who are wholesale dealers contained only preservatives, and that samples from vendors who have both a wholesale and retail trade show a much larger proportion of adulteration by preservatives than those obtained from retail shops.

All the samples of milk analysed last year are arranged below according to the percentage of total solids present, and for comparison the figures for 1899 are given. The worst sample last year was from a farmer; it contained only 7·7 per cent. of total solids, being adulterated with thirty-one per cent. of water. Another sample from the

same farmer had 8·1 per cent. of total solids, and a sample from a retail dealer contained 8·2 per cent., being adulterated with twenty-five per cent. of water, besides having twenty per cent. of its cream removed. Last year thirty-two per cent. of the samples were of low quality or adulterated, containing less than twelve per cent. of total solids. In 1899 the proportion was thirty-six per cent.

TABLE G.—COMPOSITION OF ALL SAMPLES OF MILK.

Percentage of Total Solids.	Number of Milks, 1900.			Percentage of Total Milks.	
	Wholesale only.	Wholesale and Retail.	Retail only.	1900	1899
7—	1	0	0	0·3	0·0
8—	1	0	1	0·6	0·2
9—	4	1	5	2·8	0·7
10—	2	1	14	4·7	5·5
11—	7	14	65	23·9	29·8
12—	25	18	141	51·3	53·5
13—	6	3	40	13·6	8·9
14—	0	3	5	2·2	0·7
15—	1	0	0	0·3	0·5
16—	0	1	0	0·3	0·2
Total ..	47	41	271	100·0	100·0

Preservatives were detected in forty-one samples of milk during the year; in ten instances boric acid was detected, in twenty-eight formic aldehyde, and three samples contained both preservatives. Comparative figures for previous years are given in the following table:—

TABLE H.—ADULTERATION OF MILK WITH PRESERVATIVES.

Year.	Boric Acid, per cent.	Formic Aldehyde, per cent.	Both, per cent.	Total, per cent.
1896 (April to December)	8·3	—	—	—
1897	5·5	3·3	0	8·8
1898	2·9	6·4	0·7	10·0
1899	0·9	7·5	0·2	8·6
1900	2·8	7·8	0·8	11·4

Last year preservatives were found in a larger proportion of samples of milk than in any previous year since milks were systematically examined for them. The proportion of samples adulterated with boric acid has risen from 0·9 to 2·8 per cent. Ten of the samples contained from 0·01 to 0·055 per cent. of this preservative; in two instances 0·09 per cent. was present, and one sample contained the very large proportion of 0·13 per cent. In each of the three last cases the vendor was prosecuted and fined. The steady increase in the use of formic aldehyde remarked upon in my last annual report has been maintained, the proportion of samples of milk adulterated with it having risen from 7·5 to 7·8 per cent.

The relation between preservatives and adulteration in other ways is shown in the subjoined table :–

TABLE I.—PRESERVATIVES AND ADULTERATION OF MILK.

Quality.	Number of Samples containing—		
	Boric Acid.	Formic Aldehyde.	Both Preservatives.
Good	4	20	2
Low	2	1	0
Adulterated with water .	1	6	1
Deprived of fat	3	1	0
Total samples ...	10	28	3

Thirty-nine prosecutions were instituted for the adulteration of milk. In thirty instances fines varying from 2s. 6d. to £10 were inflicted, two of them being for one sample ; one vendor absconded, and nine cases were withdrawn or dismissed on payment of costs, as the vendor was fined on the same occasion for another sample.

The four samples Nos. 318, 319, 345 and 346 were obtained from one farmer, and contained twenty-three to forty-seven per cent. of water, and No. 302 also came from him through a retailer.

Samples Nos. 553 and 554 were obtained from a vendor who was seen by the Inspector to add a white powder from his pocket to the milk while in his cart going his rounds. On analysis, I found this white powder to be mainly composed of borax.

Sample No. 587 was obtained from a farmer, one of whose customers had been fined for the adulterated sample of milk No. 553.

The vendor of sample No. 709 took out a summons against the wholesale dealer who, he stated, had supplied him with the adulterated sample ; the Magistrates after hearing the evidence fined the vendor and the wholesale dealer £5 each. The wholesale dealer had previously been fined several times for the sale of adulterated milk, and also for giving a false warranty.

Samples Nos. 713 and 714 were obtained from one vendor, one sample being taken from the milk-can and the other from a churn in the cart. He had been fined £1 in 1892 for the sale of adulterated butter.

In the case of sample No. 739 the Inspector bought and paid for a sample of milk in the ordinary way, but when he stated it was for analysis the vendor snatched the sample from him and poured it back. The Inspector however obtained another sample of the milk and summoned the vendor for obstructing him in the course of his duty, under section 16 of the Sale of Food and Drugs Act, 1899, which enacts that "Any person who wilfully obstructs or impedes any inspector or other officer in the course of his duties under the Sale of Food and Drugs Act . . . . . shall be liable, on summary conviction, for the first offence to a fine not exceeding £20, for the second offence to a fine not exceeding £50, and for any subsequent offence to a fine not exceeding £100." The Magistrates fined the vendor £10 and costs. The reluctance of the vendor to have the milk analysed may be explained by the fact that her husband was fined £2 in 1896 for the sale of adulterated milk.

Sample No. 914, which was adulterated with ten per cent. of water, was bought from a retail vendor who maintained that the milk was sold as received. Two samples, taken from the farmer who supplied him (Nos. 974 and 975), were found to contain 13 per cent. and 14 per cent. respectively of excess water, and the farmer was fined £10 by the Magistrates.

The following are the cases in which action was taken :—

NO.	DATE.	ADULTERATION.	ACTION.
77	Jan. 26th	Water in excess 20%	Fined £2 and 8s. costs.
90	,, 31st	Water in excess 8% and fat deficient 12%	Fined £2 and 8s. costs.
184	Feb. 28th	Water in excess 18%	Fined 5s. and 8s. costs.
188	,, 28th	Water in excess 17%	Fined 5s. and 8s. costs.
189	Mar. 2nd	Fat deficient 57%	Fined £5 and 10s. costs.
192	,, 2nd	Fat deficient 65%	Fined £5 and 9s. costs.
270	,, 29th	Fat deficient 25%	Fined 5s. and 8s. costs.
271	,, 29th	Fat deficient 22%	Fined 5s. and 8s. costs.
293	April 4th	Fat deficient 22%	Defendant absconded.
294	,, 4th	Water in excess 11% and fat deficient 23%	Fined £1 and 10s.6d.costs.
297	,, 4th	Water in excess 7% and fat deficient 15%	No action, owing to death of defendant.
298	,, 4th	Water in excess 6% and fat deficient 22%	No action, owing to death of defendant.
302	,, 4th	Water in excess 7% and fat deficient 10%	Prosecution withdrawn, wholesale dealer who supplied the vendor being fined for samples Nos. 318 and 319.
318	,, 11th	Water in excess 31%	Fined £5 and 17s. 6d.
319	,, 11th	Water in excess 37%	Fined £5 and 12s. 6d. Same vendor as No. 318.
340	,, 23rd	Water in excess 14% and fat deficient 23%	Fined £2 and 12 costs.
345	,, 24th	Water in excess 23%	Ordered to pay costs amounting to 9s. 6d. Same vendor as No. 318.

NO.	DATE.	ADULTERATION.	ACTION.
346	April 24th..	Water in excess 27%	Ordered to pay costs amounting to 9s. 6d. Same vendor as No. 318.
401	May 17th ...	Fat deficient 25%	Fined 5s. and 8s. costs.
553	June 28th ...	Fat deficient 28%, boric acid 0·025% ...	Fined 10s. and 11s. 6d. costs. Bought from the farmer who was fined for No. 587.
554	,, 28th ...	Fat deficient 22%, boric acid 0·025% ...	Prosecution withdrawn. Same vendor as No. 553.
557	,, 29th ...	Water in excess 21%	Fined £1 and 8s. costs.
562	,, 29th...	Fat deficient 22%	Fined 2s. 6d. and 8s. costs.
587	July 5th ...	Fat deficient 24%	Fined £5 and £2 4s. 9½d. costs.
627	,, 18th ...	Fat deficient 22%, boric acid 0·13% ...	Fined £3 and 8s. costs.
709	Aug. 16th ...	Water in excess 10%, formic aldehyde...	The vendor was fined £5 and 8s. costs, and the wholesale dealer who supplied him was fined £5 and 12s. costs.
713	,, 16th ...	Boric acid 0·09%	Fined £2 and 8s. costs.
714	,, 16th ...	Boric acid 0·09%	Ordered to pay 5s. costs. Same vendor as No. 713.
739	Sept. 5th ...	Water in excess 6%	The vendor was fined £10 and 9s. costs for obstructing the Inspector in the execution of his duty.
773	,, 18th ...	Water in excess 14%	Fined £5 and 8s. costs.
906	Oct. 31st ..	Water in excess 18%	Ordered to pay 5s. costs.
912	,, 31st ...	Water in excess 7% and fat deficient 13%	Fined £3 and 8s. costs.
914	,, 31st ...	Water in excess 10%	Summons withdrawn; bought by retailer from the farmer who was fined for No. 974
915	Nov. 1st ...	Water in excess 23%	Fined £3 and 8s. costs.
918	,, 1st ...	Water in excess 25% and fat deficient 20%	Fined £5 and 8s. costs.
974	,, 16th ...	Water in excess 14%	Fined £10 and 11s. 6d. costs.
975	,, 16th ...	Water in excess 13%	Summons withdrawn, vendor fined for No. 974.
978	,, 16th ...	Water in excess 16%	Ordered to pay 5s. costs.
979	,, 16th ...	Water in excess 10%, formic aldehyde...	Fined £2 and 8s. costs.
1117	Dec. 19th ...	Water in excess 16%, formic aldehyde ...	Fined £2 and 9s. costs.
1146	,, 31st ...	Fat deficient 25%, formic aldehyde ...	Fined 5s. and 8s. costs.

Butter and Margarine.

Last year 287 samples of butter and four samples of margarine were received for analysis. Nineteen samples of butter, or 7 per cent., were found to be adulterated with foreign fat, and ninety-five samples, or 33 per cent., were adulterated with boric acid only. The next table shows that in both respects the figures are rather worse than in the previous year :—

TABLE J.—BUTTER AND MARGARINE.

Years.	Number of Samples.	Butter.		Unlabelled Margarine.		Number of Cautions.	Number of Prosecutions.	Amount of Fines.
		Percentage of Adulteration.		Number of Samples.				
		Preservatives only.	Other ways.	Exposed for Sale.	Wholesale Consignment.			
								£ s. d.
1873-81	36	—	17	—	—	0	3	1 5 0
1882-86	153	—	35	—	—	14	32	18 18 6
1887-91	373	—	26	7	0	13	74	107 12 6
1892-96	957	—	13	19	4	28	126	268 4 6
1895	204	—	14	1	0	0	29	59 17 6
1896	258	30	9	16	4	22	37	108 10 0
1897	301	32	11	11	5	0	41	107 10 0
1898	347	19	11	4	4	6	48*	198 1 0
1899	320	26	5	6	1	0	29	97 0 0
1900	291	33	7	3	0†	0	24	68 10 0

* One prosecution was for manufacturing margarine in an unregistered factory.
† A wholesale dealer in margarine was prosecuted for not being registered.

Fourteen per cent. of the samples of butter analysed in London during 1899 were adulterated, and ten per cent. of those examined in England and Wales; but no information is given in the Report of the Local Government Board as to what proportion were adulterated with preservatives.

Boric acid was detected in thirty-five per cent. of the samples, which were free from foreign fat, and in nineteen out of twenty-three, or eighty-three per cent., of the samples of margarine and adulterated butter. In the next table all the samples of butter and margarine containing boric acid are arranged according to the quantity found to be present:—

TABLE K.—QUANTITY OF BORIC ACID FOUND IN BUTTER AND MARGARINE.

Per cent.	Number of Samples.			Percentage of Total Samples.	
	Foreign Fat present.	Foreign Fat absent.	Total.		
Less than 0·1	0	9	9	7	
0·1—	7	21	28	24	52
0·2—	9	16	25	21	
0·3—	2	14	16	14	
0·4—	3	12	15	13	37
0·5—	1	11	12	10	
0·6—	0	7	7	6	
0·7—	0	3	3	3	11
0·8—	0	1	1	1	
0·9—	0	1	1	1	
Total ...	22	95	117	100	

It will be seen that half of the samples did not contain 0·3 per cent., and this fact suggests that if it is necessary to use boric acid to preserve butter—a statement which I do not accept, as two out of every three samples received are free from it—the amount added should not exceed this quantity, and the butter should be labelled to that effect.

Sample No. 350, received on the 26th of April, was adulterated with 0·9 per cent. or 63 grains per pound of boric acid, and the vendor was fined £3 and 9s. costs.

The following nineteen samples of butter were adulterated with foreign fat, and with four exceptions also contained boric acid. The vendors of samples Nos. 242-4 were prosecuted under the Sale of Food and Drugs Act. The remainder were prosecuted under the section of the Margarine Act, which requires that every person selling margarine by retail shall in every case deliver the same to the purchaser in a paper wrapper, on which shall be printed in capital block letters, not less than a half of an inch long and distinctly legible, " Margarine."

Sample No. 782 was wrapped in a paper marked "Guaranteed Dairy Butter."

NO.	DATE.	RESULT OF PROSECUTION.
101	February 2nd	Fined £3 and 9s. costs.
102	,, 2nd	Fined £2 and 9s. costs.
242	March 22nd	Proved warranty from vendor of No. 244, ordered to pay 4s. costs.
243	,, 22nd	Proved warranty from vendor of No. 244, ordered to pay 4s. costs.
244	,, 22nd	Vendor absconded, warrant issued for his arrest.
586	July 5th	Fined £5 and 13s. costs.
706	August 16th	Fined £5 and 10s. costs.
731	September 4th	Fined £5 and 9s. costs.
769	,, 13th	Fined 10s. and 9s. costs.
782	,, 20th	Fined £10 and 9s. costs.
840	October 5th	Fined £2 and 9s. costs.
856	,, 17th	Fined £2 and 9s. costs.
859	,, 17th	Fined £3 and 9s. costs. The vendor had been fined £1 for adulterated butter in 1896.
861	,, 17th	Fined £3 and 9s. costs.
863	,, 17th	Fined £3 and 9s. costs.
890	,, 26th	Fined £5 and 9s costs.
919	November 1st	Fined £3 and 9s. costs.
920	,, 1st	Fined £3 and 9s. costs.
984	,, 20th	Fined £5 and 11s. costs.

Each of the four samples of margarine contained boric acid. The vendor of No. 936 was fined £1 and 11s. costs for being a wholesale dealer in margarine without being registered. The other three samples were exposed for retail sale without being properly labelled in accordance with the provisions of the Margarine Act. The fines were as follows :—

NO.	DATE.	FINE.
98	February 2nd	£1 and 8s. costs.
415	May 18th	£2 and 8s. costs.
756	September 12th	£2 and 8s. costs.

Bread and Butter.

Of the twenty-two samples of "butter" spread on the bread received, no less than ten consisted of "margarine," while in five other cases the butter was adulterated with boric acid.

Prosecutions were instituted in each case in which foreign fat was present. As these were the first instances of adulterated bread and butter detected in Birmingham, the Magistrates inflicted only a small fine, but stated that in any further cases a substantial penalty would be imposed.

NO.	DATE.	ANALYSIS.	FINES.
140—Feb.	16th	Fat 7% of which 90% was foreign to butter	5s. and 8s. costs.
142— ,,	17th	Fat 11%, entirely foreign to butter	5s. and 8s. costs.
143— ,,	17th	Fat 5%, entirely foreign to butter	5s. and 8s. costs.
144— ,,	17th	Fat 10%, of which 90% was foreign to butter	5s. and 8s. costs.
146— ,,	17th	Fat 9%, of which 90% was foreign to butter	5s. and 10s. costs.
151— ,,	20th	Fat 7%, of which 90% was foreign to butter	5s. and 10s costs.
154— ,,	20th	Fat 5%, entirely foreign to butter	5s. and 8s. costs.
155— ,,	21st	Fat 7%, of which 90% was foreign to butter	5s. and 9s. costs.
172— ,,	26th	Fat 5%, of which 90% was foreign to butter	5s. and 8s. costs.
173— ,,	26th	Fat 5%, of which 90% was foreign to butter	5s. and 10s. costs.

Cheese, Skimmed-Cheese, Margarine-Cheese.

Sixty samples of cheese and one sample of skimmed-cheese were found to be free from adulteration by foreign fat. This is a form of adulteration which I have not found common in Birmingham, as only three out of the sixty-three samples examined during the previous ten years were thus sophisticated. One and a half per cent. of the samples analysed during 1897-9 in England and Wales were adulterated.

The Sale of Food and Drugs Act, 1899, which came into operation last year, requires that all samples of cheese containing foreign fat shall be marked "'margarine-cheese" when they are exposed for sale. The following two samples of margarine-cheese were exposed for sale without any label being placed on them.

NO.	DATE.	FINE.
321—April	20th	£1 and 8s. costs.
322— ,,	20th	The vendor was ordered to pay 8s. costs, and the assistant who sold the sample was fined 10s. and 10s. costs.

Coffee.

Eleven of the 140 samples of coffee received, or eight per cent., were adulterated with quantities of chicory varying from thirty to ninety per cent. One sample contained a very small quantity, probably accidentally present.

TABLE L.—COFFEE.

Years.	Number of Samples.	Percentage of Adulteration.	Cautions.	Prosecutions.	Fines.
					£ s. d.
1873-81	86	14	0	3	1 5 0
1882-86	92	43	23	1	1 10 0
1887-91	113	37	0	5	1 10 0
1892-96	276	6	4	13	21 6 0
1897	142	15	3	18	29 15 0
1898	91	9	0	8	18 10 0
1899	111	11	1	10	16 5 0
1900	140	8	0	9	15 5 0

The proportion of adulteration with chicory last year, eight per cent., was rather less than the average, and decidedly better than in 1899 and 1897. In 1899, eight per cent. of the samples of coffee analysed in London, and seven per cent. of those examined in England and Wales, were reported to be adulterated.

The following list gives particulars of the samples in which action was taken :—

NO.	DATE.	ADULTERATION.	RESULT OF PROSECUTION.
39—	Jan. 17th	... Chicory, 70%	Fined 5s. and 10s. costs.
70—	,, 25th	.. Chicory, 65%	Fined £2 and 9s. costs.
72—	,, 25th	... Chicory, 30%	Fined £2 and 9s. costs.
408—	May 18th	... Chicory, 65%	Fined £2 and 9s. costs.
433—	,, 24th	... Chicory, 85%	Fined £2 and 9s. costs.
450—	,, 30th	... Chicory, 50%	Fined £1 and 9s. costs.
582—	July 5th	.. Chicory, 46%	Fined £1 and 9s. costs.
592—	,, 10th	.. Chicory, 90%	Fined £2 and 9s. costs.
986—	Nov. 20th	... Chicory, 65%	Fined £3 and 9s. costs.

DEMERARA SUGAR.

Two of the twenty-five samples received were dyed with a coal tar colour. No. 267 was received on the 27th day of March, and No. 312 on the 6th day of April. In each case I certified that the sample was composed of 100 per cent. of dyed sugar crystals. Your Committee ordered both vendors to be prosecuted, and the second case (No. 312) was heard first. I gave evidence that in my opinion the sample was composed of cane sugar dyed with an aniline dye, and that I considered "Demerara Sugar" should be free from foreign dye. Messrs. Alfred H. Allen and Charles A. Cassal, public analysts, supported me in this opinion, and representatives of large firms of sugar brokers and manufacturers, from London and Liverpool, stated emphatically that in the wholesale trade the term "Demerara Sugar"

meant only sugar made in Demerara and free from foreign dye, and that Demerara sugar was worth more in the market than raw sugar from any other source. The defence admitted that the sample was dyed, and did not dispute the statement that in the *wholesale* trade Demerara sugar meant sugar from Demerara, but maintained that any raw West Indian cane sugar, dyed or undyed, was by the custom of the *retail* trade entitled to be sold as Demerara, and brought witnesses to prove it. The Magistrates concurred with this view. and dismissed the case, finding that the sample was dyed but was of the nature, substance and quality of Demerara sugar, and that the dye was not injurious to health.

The amount of ash found in the other sample of so-called Demerara sugar (No. 267) was the same as that found in *white* crystallised sugars, and indicated that it was not a raw but a refined sugar. As refined *beet* sugar is cheaper than refined *cane* sugar, in all probability this sample was a sample of white *beet* sugar dyed yellow to imitate Demerara, or was what is known as "yellow crystals." While therefore the sample was *probably* obtained from beet-root, in the present state of analytical knowledge it is *impossible to prove* that such was the case, as chemically pure sugar prepared from the sugar cane is analytically identical with chemically pure sugar prepared from beet-root, though commercially their value is very different, and it was considered advisable to withdraw the prosecution in this case. The practical effect of the Magistrates' decision is therefore, that, so far as Birmingham is concerned, any yellow sugar, either cane or beet, dyed or undyed, dear or cheap, can be sold as Demerara sugar.

I may say that only three of the 119 samples previously bought in Birmingham under the Acts were dyed like these two samples, and that since the hearing of this case fines have been inflicted by the Magistrates of Godstone, Littledean, Gloucester, Tredegar, and Cirencester, for the sale of similarly-dyed samples of so-called "Demerara Sugar."

Below are given copies of two circulars relating to Demerara sugar. The first has been issued by the West India Committee. It will be noticed that they define Demerara sugar as "Sugar made in Demerara, Trinidad, or any other British West Indian Colony *by the usual well-known Demerara process.*" They consider that sugars coloured with aniline dye, no matter where they come from, are not of the nature, substance and quality, of what is known as Demerara sugar.

The second one is from the British Guiana Planters' Association, and they deny absolutely that aniline or other dyes are used in the manufacture of Demerara cane sugar, and send certificates from the fifty-four sugar factories in the colony to that effect.

"WEST INDIA COMMITTEE.

"SALE OF FOOD AND DRUGS ACT.

"*Memorandum regarding Demerara Sugar.*

"The recent prosecution by the Birmingham Town Council, under the Sale of Food and Drugs Act, of a grocer, for selling aniline-dyed sugar as Demerara sugar, has attracted much attention in the trade. As there appears to be considerable misapprehension of the whole question and some mis-statements having been made in the course of the proceedings before the Magistrate, the West India Committee think it desirable to make known certain facts with regard to Demerara sugar and the question generally.

"It is a fact, that where factories are provided with modern machinery, as in Demerara, Trinidad, and St. Lucia, and in one or two isolated cases in other British West Indian Colonies, the process of manufacture of yellow crystals is practically the same in all cases, and it therefore may be safely maintained that crystallised yellow sugar, as it comes to this market, from the British West Indies or British Guiana, is all the same 'nature, substance and quality,' and therefore, any conviction of a grocer, under the Sale of Food and Drugs Act for selling Trinidad crystallised yellow sugar as Demerara, could only be made under a misapprehension of the facts of the case.

"The case of aniline-dyed sugar, however, is materially different, and sugars which are coloured by means of aniline dyes cannot fairly be said to be of the same 'nature, substance and quality' as Demerara sugar.

"The yellow colour in Demerara sugar is the result of a fine layer of molasses, which, as a result of the process, remains adherent to the otherwise white crystals. This molasses has a very distinct and very agreeable flavour, and it is due to this flavour that Demerara sugar has become so generally popular.

"In the case of aniline-dyed sugars, the white crystal is surrounded by a thin layer of aniline dye and water, which has no appreciable aroma or flavour, in fact, whatever slight flavour it may add to the sugar is distinctly of a disagreeable nature.

"It is perfectly true, that so far as the percentage of pure sugar is concerned, aniline-dyed sugar *may* contain as high a percentage as Demerara sugar, just as ordinary claret at 16/- a dozen *may* contain as much alcohol as the finest Lafitte worth 160/- per dozen. In the case of both sugar and claret, the value depends partly on the flavour.

"It was stated before the Magistrate at Birmingham that aniline dyes are used in the manufacture of Demerara sugar. This is not the case. It is true that some fifteen years ago, certain experiments were made in Demerara with aniline dyes, but as a result, it was found that :

1. They did not improve the colour of the sugar.
2. They added appreciably to the cost.
3. They deteriorated the flavour.

"Hence they were universally given up, and no aniline dye is now used in Demerara; and the same thing holds good in the British West India Islands which manufacture yellow crystallised sugar on Demerara lines. What the West India Committee would distinctly understand by Demerara sugar is sugar made in Demerara, Trinidad, or any other British West Indian Colony by the usual well-known Demerara process. If sugar were exceptionally made in Demerara by some new process, involving the use of aniline dye, or involving any serious modification of its character, it is doubtful whether such sugar could be fairly said to be of the 'nature, substance and quality' of what has been known for the last forty years as Demerara sugar. Hence, in the opinion of the West India Committee, sugars coloured with aniline dye, no matter where they may come from, are not of the 'nature, substance and quality' of what is known as Demerara sugar.

"It was freely stated before the Magistrate in Birmingham that Demerara sugars are dyed, and it was also stated that what is known as 'bloomer' and 'phosphoric acid' are used as dyes. Neither bloomer (chloride of tin) nor phosphoric acid are in any sense dyes. Both the one and the other are used in order to restore to the sugar the natural colouring matter which is affected by the use of lime.

"Sugar, whether made from cane-juice or beet-juice, cannot be extracted until the juice has been treated with lime. This lime affects the colouring matter in the cane juice, and the action of bloomer and phosphoric acid is to set free the organic acids which the lime takes up, and thus to restore and fix the colouring matter existing in the juice in the same condition in which it existed prior to the introduction of lime.

"WEST INDIA COMMITTEE, "N. LUBBOCK,
"BILLITER SQUARE BUILDINGS, "*Chairman.*"
"LONDON, E.C.

"ALGERNON E. ASPINALL,
"*May*, 1900. "*Secretary.*"

"THE BRITISH GUIANA PLANTERS' ASSOCIATION.

"THE CHAMBER OF COMMERCE OF THE CITY OF GEORGETOWN.

"Georgetown, Demerara,
"British Guiana.

"Sir,—The attention of those interested in the production of Demerara crystals having been called to the recent proceedings in the law courts of Birmingham against a grocer for 'selling Demerara sugar which was not of the nature substance, and quality' of the

article demanded, inasmuch as it contained 100 per cent. of dyed 'sugar crystals,' we have to say that there is no truth whatever in the statement that aniline or any other dyes are used in the manufacture of Demerara cane-sugars.

"In support of this statement we have sent certificates from the fifty-four sugar factories in this colony, signed by the respective managers to the West India Committee, London, where they can be seen by anyone interested, and we challenge the fullest investigation into the correctness of this assertion.

"We are, Sir,

"Your obedient servants,

"The British Guiana Planters' Association.

(Signed) "A. SUMMERTON,

"*Secretary.*"

"The Chamber of Commerce of the City of Georgetown.

(Signed) "J. H. DE JONGE,

"*Secretary.*"

Baking Powder.

Six of the nineteen samples contained alum, and the vendors were prosecuted for the sale of an article injurious to health. For a number of years baking powder was regarded as food, and convictions were obtained for the sale of adulterated articles. In 1894 the Judges of the Court of Queen's Bench decided in the appeal case, James v. Jones, that baking powder was not an article of food in the meaning of the Sale of Food and Drugs Acts, and so prevented any further samples being taken. The Act passed last year extended the definition of "food," so as to include "any article which ordinarily enters into or is used in the composition or preparation of human food," and therefore baking powder is again legally a "food." The necessity of this action is shown by the large proportion of the samples containing the very objectionable ingredient alum.

The thirteen samples free from alum had been prepared from bicarbonate of soda, tartaric acid and rice flour. Some of them had not been kept perfectly dry, and contained tartrate of soda produced by the reaction of the first two ingredients. A baking powder should consist of harmless materials which on the addition of water will evolve carbonic acid gas, with sufficient starchy material to prevent premature decomposition. The efficiency of a baking powder will be proportionate to the amount of this gas produced by adding water to it. In these powders this varied from one to nine per cent., while the rice flour varied from fifty-two to eighty-one per cent. The tartaric acid and the bicarbonate of soda should be present in the proportion of

one of the former to 1·12 of the latter. In these samples the proportions varied from practically equal weights, to one part of tartaric acid to twelve of sodium bicarbonate, the latter being nearly all bicarbonate of soda. The raising power of the five samples containing over eighty per cent. of rice flour would be very slight, and their sale is very nearly, if not quite, a fraud on the public, but unfortunately there is no standard of composition, and I did not feel justified in certifying them as adulterated.

The other six samples were adulterated with alum, and contained from thirteen to thirty-five per cent. of this objectionable ingredient. Five of them did not yield more than four per cent. of carbonic acid gas, so that besides containing alum they were deficient in raising power.

Sample No. 770 was marked "PRIZE MEDAL BAKING POWDER," and No. 761 actually claimed to make bread more digestible, in spite of the presence of twenty-five per cent. of alum. It bore the following impudent label :—

> "By the use of this preparation, as the saccharine properties of the flour, which are destroyed by fermentation with Yeast, are preserved, the Bread is more nutritive, and a larger quantity is obtained from the same weight of flour.
>
> Bread made with Yeast, if eaten before it becomes stale, ferments again in the stomach—producing indigestion and numerous other complaints ; when made with this Powder it is free from all such injurious effects. The Powder is equally valuable in making
>
> Puddings and Pastry,
>
> which it deprives of all their indigestible properties."

Particulars of the adulterated samples are given below. The magistrates intimated that any further cases would not be so leniently dealt with.

NO.	DATE.	ADULTERATION.	ACTION.
761	Sept. 13th	Alum 25%	Fined 10s. and 9s. costs.
770	,, 13th	Alum 13%	Summons dismissed, as the vendor was fined for a sample of butter (No. 769).
806	,, 28th	Alum 30%	Ordered to pay 6s. costs.
807	,, 29th	Alum 30%	Ordered to pay 6s. costs.
816	,, 29th	Alum 25%	Ordered to pay 6s. costs.
827	Oct. 3rd	Alum 35%	Ordered to pay 6s. costs.

EGG POWDER.

All the fifteen samples of egg powder were free from alum. An unprejudiced person would expect that a preparation known as egg powder was either prepared from eggs or that it was of a similar composition to and a suitable substitute for them. This opinion would be supported by such labels as the following :—No. 804 was

marked, "—— Egg Powder is a first-class substitute for eggs." No. 814 made the following claims:—

> "—— Concentrated Egg Powder. A complete substitute for, but not made from eggs. This valuable preparation is a complete substitute for eggs in the making of all sorts of cakes, &c., to which it imparts the lightness, richness, appearance and flavour of new laid eggs."

Eggs are chiefly used in cookery for two purposes, to produce richness and lightness. The richness is due to the fact that an egg contains rather more than 100 grains of nitrogenous food, such as albumen, &c., and a similar quantity of fat. The glairy albumen of the egg when beaten up encloses a considerable quantity of air, and the gradual escape of this air during cooking produces lightness.

These samples of egg powder were practically nothing but baking powder coloured with turmeric or a coal-tar dye. Several of them had very little raising power, yielding less than one per cent. of carbonic acid gas on wetting. The "richness" imparted by them is confined to the small amounts of nitrogenous matter and fat contained in the rice or maize flour of which they are composed, though the colouring matter present might produce the appearance of richness. In short, these powders may impart lightness, but the "richness" will be less than that of an equal weight of ordinary flour. The labels quoted were distinct, if not fraudulent misrepresentations, but the absence of a standard prevents an analyst classing them as adulterated. Two samples (Nos. 799 and 818) bore fairly honest labels as follows:—

> "—— Egg Powder. Not made from eggs. This valuable preparation may be used with great advantage in the making of all sorts of cakes, &c., to which it imparts all the lightness of eggs."

Custard Powder.

All the six samples of custard powder were free from alum. They were composed of maize or arrowroot with a small quantity of mineral matter, and coloured with turmeric or a coal-tar dye. Custards are prepared with eggs and milk, and form a nutritious article of diet, particularly for invalids. "Custards" made with these powders would be no more nutritious than milk thickened with arrowroot or cornflour, and the difference in nutritive power might be serious in cases of illness. Again large claims are made on the labels. No. 813 is marked:—"——Custard Powder makes the richest custards without eggs at half the cost and trouble." The label of No. 820 had the following observation:—

> "Custards made with this powder are considered by the Medical Profession to be more nutritious and lighter of digestion than any kind of meat, and is being strongly recommended by the most eminent medical men as a beneficial food for supper, and for invalids there is nothing to equal it."

If these samples had been certified as adulterated, the "custom of the trade" would be largely brought up to prove that custard powders always were so prepared, and a conviction would be impossible, but one strongly feels that deceptive labels such as the preceding should be prohibited.

Golden Syrup.

Three samples of golden syrup were received. One of them (No. 284) contained 30 per cent. of glucose syrup, the other two contained only products of the sugar cane and water.

Other Articles of Food.

Thirty-seven samples of *white pepper*, twenty-three samples of *arrowroot*, twelve samples each of *malt vinegar* and *flour*, eleven samples of *oatmeal*, and eight samples of *bread* were found to be free from adulteration, and no arsenic was detected in the eight samples of *sugar confectionery*.

II.—SAMPLES OF DRINK.

The subjoined table shows that two of the thirty-seven samples of articles of drink received were adulterated. The proportion of adulteration in spirits is as usual high, viz., two samples adulterated out of the eleven received :—

Table M.—Samples of Drink.

Articles.	No. of Samples Analysed.	No. found to be Genuine.	No. found to be Adulterated.
Beer	21	21	0
Ale	5	5	0
Scotch Whisky..	7	6	1
Gin	4	3	1
	37	35	2

Beer, Ale.

Arsenic was not detected in any of the twenty-one samples of *beer* or five samples of *ale*, and salt was not found to be present in excessive quantity.

Scotch Whisky.

On the 9th day of March I received seven samples for analysis ; six of them were of legal strength, containing seventy-five to eighty-four per cent. of proof spirit. Sample No. 212 contained only sixty-seven per cent., being adulterated with ten per cent. of water. The vendor was fined £2 and 8s. costs.

GIN.

Three samples contained sixty-six to seventy-one per cent. of proof spirit, but No. 213, which was obtained from the same vendor as the above adulterated whisky, only contained sixty-three per cent., being adulterated with three per cent. of water. The vendor was fined £2 and 8s. costs for this sample also.

III.—SAMPLES OF DRUGS.

The following is a list of the drugs analysed last year, classified as genuine and adulterated :—

TABLE N.—SAMPLES OF DRUGS.

Articles.	No. of Samples Analysed.	No. found to be Genuine.	No. found to be Adulterated.
Compound Tincture of Benzoin ...	13	11	2
Friar's Balsam	6	6	0
Camphorated Oil...	10	9	1
Milk of Sulphur	9	9	0
Effervescent Tartarated Soda Powders	6	5	1
Seidlitz Powders	5	4	1
Tincture of Iodine	5	3	2
Paregoric	4	4	0
Compound Tincture of Rhubarb ...	3	3	0
	61	54	7

Seven of the sixty-one samples of drugs examined, or eleven per cent., were found to be adulterated. Forty-one samples were bought from persons whose names are on the official register of Chemists and Druggists; nine samples were obtained from unregistered persons ; and eleven samples were bought from companies. The number of the adulterated samples in these classes were as follows :—Registered persons, three samples, or seven per cent. of adulteration ; unregistered persons, one sample, or eleven per cent. ; companies, three samples, or twenty-seven per cent.

The following table includes comparative particulars of the amount of adulteration and of legal proceedings for past years :—

TABLE O.—DRUGS.

Years.	Number of Samples.	Percentage of Adulteration.	Cautions.	Prosecutions.	Fines.
					£ s. d.
1873-81	79	23	0	0	—
1882-86	76	29	7	0	—
1887-91	443	15	13	7	16 0 0
1892-96	517	23	60	25	28 5 0
1897	108	19	7	4	11 1 0
1898	27	26	2	4	1 15 0
1899	85	22	6	12	25 0 0
1900	61	11	0	7	62 0 0

Last year eleven per cent. of the samples of drugs analysed were found to be adulterated. This proportion is very much better than in any recent year. Since 1892 I have never found less than nineteen per cent. to be adulterated, and in two years the proportion rose as high as twenty-seven per cent. This may be partly accounted for by the fact that this year the Inspector has asked for each drug "prepared according to the British Pharmacopœia." For the repression of adulteration it is necessary that articles should be asked for under their *ordinary* names, otherwise the vendor is warned at once that the article is required for analysis, and will be careful not to sell an article which he suspects or knows to be adulterated. With many qualified chemists, no doubt, the method of asking will make no difference to the article supplied, but I should think there are many persons who, for instance, have an article which they would readily sell as Friars' Balsam which they would refuse to sell as "compound tincture of benzoin, prepared according to the British Pharmacopœia," and in many cases these are just the persons who are selling inferior drugs and carrying on illegitimate competition.

The Report of the Local Government Board shows that twelve per cent. of the drugs sold in London during 1899 were adulterated, and eighteen per cent. of those examined in England and Wales as a whole.

Seidlitz Powders, Effervescent Tartarated Soda Powders.

Five samples were submitted as *Seidlitz powders*. The four white powders of No. 19 contained from 14 to 22 grains of tartaric acid, instead of 38 grains as directed by the British Pharmacopœia. The four blue powders contained from 116 to 137 grains, instead of 160 grains; each powder, on the average, contained 39 grains of Rochelle salt, instead of 120 grains, while the cheaper ingredient, bicarbonate of soda, was in excess—85 grains being present instead of 40. The powders were wrong both in quantity and quality, and very unevenly divided. What made the matter worse was that each pair of powders was labelled as follows:—

"CAUTION TO THE PUBLIC.

"Thousands of boxes of a common imitation of the genuine Seidlitz Powders are being sold by unprincipled traders for the sake of extra profit. We guarantee all our Powders to be genuine. (Signed) ———"

The vendor, who is not a qualified chemist, was fined £5 in 1897 for adulterated glycerine, and the Magistrates fined him £10 and 9s. costs in this case, a fine which, considering the scandalous nature of the offence, does not appear to err on the side of severity.

Six samples were purchased under the Pharmacopœia name of *effervescent tartarated soda powders*. The white powders of sample No. 14 contained from 30 to 34 grains of tartaric acid instead of 38

grains, while the blue powders were practically correct in composition. A fine of £1 and 10s. costs was inflicted by the Magistrates. The defendant had been fined £1 in 1898 for selling adulterated compound tincture of benzoin.

The blue powders of the remaining nine samples were very uniformly divided, thirty of the thirty-six powders being within five grains of 160 grains—the proper amount; one powder contained 147 grains only, and five powders had from 166 to 169 grains. In each case the bicarbonate of soda and Rochelle Salt were present in the proper proportions, or nearly so.

The tartaric acid in the white papers was not so well divided; one paper contained 33 grains, six from 41 to 43 grains, and one had 44 grains, one 45 grains, and the remaining twenty-five papers contained 36 to 40 grains of tartaric acid.

Compound Tincture of Benzoin, Friars' Balsam.

The whole of the nineteen samples received were of the full alcoholic strength, or nearly so, and sixteen of them were of satisfactory quality, containing from 16·9 to 20·1 grammes of solid extract per 100 cubic centimetres. One sample was somewhat deficient in extract, and two, or eleven per cent., of the whole were adulterated. During the previous five years twenty per cent. of the samples of compound tincture of benzoin analysed in Birmingham were adulterated.

The following were the adulterated samples; the first was obtained from the same vendor as the samples of adulterated effervescent tartarated soda powders No. 14, and camphorated oil No. 1098. The vendor of the second sample had been fined in 1895 for adulterated tincture of senna. He also sold the adulterated sample of tincture of iodine No. 1107 :—

NO.	DATE.	ADULTERATION.	ACTION.
1099	Dec. 12th...	Solid extract deficient 36%	Fined £20 and 10s. costs. Notice of an Appeal to Quarter Sessions was given but withdrawn.
1108	,, 15th...	Solid extract deficient 18%	Fined £5 and 11s. costs.

Tincture of Iodine.

Three samples contained from twenty-four to twenty-six grammes per litre of iodine and iodide of potassium, having been prepared according to the directions of the British Pharmacopœia. One sample was much too strong, and another was very weak in iodine. This last sample was obtained from the same vendor as the adulterated compound tincture of benzoin No. 1108.

NO.	DATE.	ADULTERATION.	ACTION.
1090	Dec. 10th...	Iodine and potassium iodide, of each 20% in excess	Fined £1 and 10s. costs.
1107	,, 15th...	Iodine deficient 23%	Fined £5 and 11s. costs.

Camphorated Oil.

Eight of the ten samples received contained camphor in similar proportion to that ordered by the British Pharmacopœia. One sample when received contained a decided deposit of solid camphor, which after gentle warming dissolved, and I found that twenty-five per cent. of camphor was present, being an excess. This sample was very unsatisfactory, but I felt I could hardly certify it as adulterated. Sample No. 1098, purchased from the vendor of the adulterated sample of compound tincture of benzoin No. 1099, was deficient of twenty-two per cent. of camphor, and the vendor was fined £20 and 10s. costs, but Notice of Appeal to Quarter Sessions was given but withdrawn. All the samples had been prepared with olive oil.

This proportion of adulteration, one sample out of ten, is a great improvement on previous years; in 1897 four samples out of fifteen were adulterated, and ten out of thirty-two in 1899. Twenty-eight per cent. of the samples of camphorated oil analysed in England and Wales during 1899 were adulterated.

Other Drugs.

Nine samples of *milk of sulphur*, four samples of *paregoric*, and three samples of *compound tincture of rhubarb* were all found to be genuine.

III.—LEGAL PROCEEDINGS.

The following table shows what articles were found to be adulterated, with the proceedings taken and the amounts of the fines inflicted :—

Table P.—Legal Proceedings.

ARTICLES.	OFFENCES.	PROSECUTIONS.	FINES.	AMOUNT OF FINES. £ s. d.
Milk	77	39	30*	90 2 6
Butter	114	20	17	62 10 0
Margarine	4	4	4	6 0 0
Bread and Butter	15	10	10	2 10 0
Coffee	11	9	9	15 5 0
Baking Powder	6	6	1	0 10 0
Margarine-Cheese	2	2	2	1 10 0
Demerara Sugar	2	2	0	—
Golden Syrup	1	0	0	—
Scotch Whisky	1	1	1	2 0 0
Gin	1	1	1	2 0 0
Compound Tincture of Benzoin	2	2	2	25 0 0
Tincture of Iodine	2	2	2	6 0 0
Camphorated Oil	1	1	1	20 0 0
Effervescent Tartarated Soda Powders	1	1	1	1 0 0
Seidlitz Powders	1	1	1	10 0 0
Total	241	101	82†	£244 7 6‡

* In one case both the vendor and the wholesale dealer were fined.

† Eleven other vendors were ordered to pay the costs of prosecution only.

‡ The costs of the prosecutions amounted to £43 5s. 3½d.

Below are given the results of the prosecutions ; the corresponding figures for the previous year are also given for comparison. Several cases were withdrawn or dismissed, either because the vendor was fined for another sample, or because the wholesale dealer from whom the adulterated sample was bought was fined.

TABLE Q.—PROSECUTIONS.

RESULT OF PROSECUTION.	NUMBER OF CASES. 1899.	1900.
Vendor fined £20	0	2
,, £15	1	0
,, £10	6	4
,, £5	18	16*
,, £3	8	11
,, £2	20	18
,, £1	15	9
,, 10s.	10	4
,, 5s.	9	17
,, 2s. 6d.	0	1
,, 1s.	1	0
Vendor ordered to pay costs only	5	11
Case withdrawn...	9	5
Case dismissed ...	3	2
Vendor absconded	0	2
Total	105	102*

* In one case both the vendor and the wholesale dealer were fined.

The following table includes particulars of the legal proceedings taken in previous years. It will be seen that the amount of the fines was somewhat smaller than in the three previous years. This is partly due to the fact that last year eighteen fines were only 5s. or less, against ten such fines in the previous year. The average fine last year was with one exception higher than in any previous year. The large increase in the number of offences in 1896 is due to the inclusion, for the first time, of samples of milk and butter adulterated with preservatives :—

TABLE R.—LEGAL PROCEEDINGS.

Year.	Number per Annum.				Fines.	
	Offences.	Cautions.	Prosecutions	Fines.	Per Annum.	Average.
					£ s. d.	£ s. d.
1873-76	39	2	14	12	8 16 3	0 14 8
1877-81	45	3	18	16	22 19 0	1 8 0
1882-86	100	31	35	30	30 7 1	1 0 0
1887-91	108	25	35	30	53 6 5	1 15 6
1892-96	151	48	72	63	110 9 6	1 15 0
1896	233	83	101	91	209 18 0	2 6 1
1897	284	39	126	119	257 17 0	2 3 4
1898	225	32	97	87	269 18 6	3 2 1
1899	245	9	105	88	251 6 0	2 17 1
1900	241	0	101	82	244 7 6	2 19 8

IV.—REPORT OF COMMITTEE ON MILK AND CREAM REGULATIONS.

Since writing the above the Committee which was appointed by the Board of Agriculture to enquire and report upon the desirability of regulations being made for milk and cream under Section 4 of the Food and Drugs Act, 1899, has issued its report.

The Act of 1899 empowered the Board of Agriculture to make regulations for determining what deficiency in any of the normal constituents of milk or cream shall raise a presumption, until the contrary is proved, that a sample is not genuine, and an analyst shall have regard to such regulations in certifying the result of an analysis under the Acts.

The Committee make a number of recommendations to the Board of Agriculture, some of the most important of which I think it wise to bring at once before your notice.

They recommend that any sample of milk which contains less than twelve per cent. of milk-solids and less than 3·25 per cent. of milk fat or less than 8·5 per cent. of non-fatty milk-solids shall be presumed to be adulterated, until the contrary is proved.

That any skimmed or separated milk containing less than nine per cent. of milk-solids, or any condensed milk (unless protected by a label) containing less than ten per cent. of milk fat, or less than twenty-five per cent. of non-fatty milk-solids, shall be presumed to be adulterated until the contrary is proved.

That the artificial thickening of cream by any addition of gelatine or other substance shall raise a similar presumption.

I remain,

Mr. Chairman and Gentlemen,

Your obedient Servant,

ALFRED HILL, M.D., F.I.C.,

City Analyst.

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