

[Report of the Medical Officer of Health for Paddington].

Contributors

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Paddington.

SANITARY REPORT

FOR THE YEAR

1877.

BY

JAMES STEVENSON, M.D.,

Medical Officer of Health.



THIRD ANNUAL REPORT.

To the Vestry of the Parish of Paddington.

GENTLEMEN,

The health of the inhabitants of London during the year 1877, notwithstanding the prevalence of small pox in an epidemic form, was exceptionally good. This remark is not the less true when restricted to Paddington ; and the fact, taken in connexion with the evidence furnished by previous reports, is the more gratifying, inasmuch as it indicates progressive improvement in the sanitary condition of the parish. It is a matter of certainty, that during the last few years, although there has been an increase in the population, and in the number of inhabited houses in the parish, there has nevertheless been an absolute decrease in the mortality. A comparison of the total deaths from all causes, during the past five years, gives more reliable evidence upon this point than a comparison of the death rates during the same period, as these would

necessarily be derived from an estimate of the population of the parish, which might possibly be erroneous.

Year.	Deaths from all causes.		TOTAL.
	St. Mary.	St. John.	
1877	1,227	659	1,886
1876	1,277	690	1,967
1875	1,371	621	1,992
1874	1,268	677	1,945
1873	1,304	710	2,014

These figures show all the deaths registered in the parish, including those in the Lock Hospital, and in St. Mary's Hospital, though many of these latter were not those of parishioners.

During the registration year of 52 weeks, ending Saturday, 29th December, 1877, 2,921 births and 1,886 deaths were registered in Paddington. The natural increase of population from the excess of births over deaths was 1,035. Adding to this number the contingent contributed by the immigration of persons from neighbouring parishes and from the country, and assuming the rate of increase to be the same as during the last census period (1861-71), the population of the parish in the middle of last year may be estimated at 109,425, allowing 70,554 inhabitants to St. Mary's, and 38,871 to St. John's sub-district. Of the 2,921 births, which were slightly in excess of those in the

preceding year; 2,226 were registered in the sub-district of St. Mary, and 695 in that of St. John; the number of male children being 1,497, and of female, 1,424. The proportion of the sexes was 100 males to 95 females, the same as throughout the Metropolis. In St. Mary's the proportion was 100 males to 97 females, and in St. John's 100 males to 90 females. The births were most numerous in the first, and least so in the fourth, quarter of the year. The ratio of births to the entire population of the parish was 1 birth to 37 inhabitants, or a birth-rate of 26·7 per 1,000 of the population. The birth-rate for London was 36·1.

In St. Mary's District, the ratio of births to the population was 1 to 32 persons living, or a birth-rate of 31·6 per 1,000 inhabitants.

In St. John's, the ratio of births to the population was 1 to 56 persons living, or a birth rate of 17·9 per 1,000.

Some of the above particulars are shown in the subjoined Table:—

Sub-Districts.	Estimated Population.	Births.	Ratio of Births to Population.	Rate per 1,000.
St. John's	38,871	695	1 to 56	17·9
St. Mary's	70,554	2,226	1 to 32	31·3
Paddington	109,425	2,921	1 to 37	26·7

The birth-rate for 1877 was below that of any one of the ten previous years. In St. John's, for reasons

explained in my first report, the birth-rate remains nearly stationary — has in fact slightly decreased. Little variation can be expected, so long as the condition of the residents in Tyburnia is the same, as regards their ages, the proportion of the sexes, their social position, and the existence of so many unmarried persons, mostly of the domestic servant class.

Of the 1,886 deaths registered in the parish, 5 occurred in the Lock Hospital, and 224 in St. Mary's Hospital. But as none of those who died in the Lock Hospital, and 49 only of those who died in St. Mary's Hospital, were parishioners, the corrected number of deaths of parishioners during the year is 1,706.

Of these 1,706 deaths, 1,220 occurred in St. Mary's sub-district, including the 147 deaths, 64 males and 83 females, which took place in the Workhouse. The remaining 486 deaths occurred in St. John's, and include the 49 which happened in St. Mary's Hospital.

The deaths were most numerous in the second, and least so in the third, quarter of the year.

Some of the foregoing particulars are shown, as under :—

Sub-Districts.	Estimated Population.	Deaths.	Ratio of Deaths to Population.	Rate per 1,000.
St. John's	38,871	486	1 to 80	12·5
St. Mary's	70,554	1,220	1 to 58	17·3
Paddington	109,425	1,706	1 to 64	15·6

In 1877 the death-rate for London was 21·9 per 1,000.

„	„	Edinburgh	21·1	„	„
„	„	Glasgow	24·8	„	„

The following table shows the rate of mortality in each one of the five groups of districts into which London is divided.

Deaths registered in the London Districts.

West Districts	.....	19·1	per 1,000.
South	„	21·3	„
North	„	21·8	„
Central	„	24·1	„
East	„	24·4	„

Paddington „ 15·6 „

It is true that, in calculating the death-rate, no allowance has been made for the deaths unknown to me of parishioners in the Hospitals of the Metropolitan Asylum Board, and in other institutions, and places outside the parish, but a death rate of 15·6 per 1,000 for the whole parish affords an ample margin to meet such deficiencies.

It will be observed, (Table 1) that during last year, 1877, the deaths of parishioners, including those who died in St. Mary's Hospital, were fewer than in either of the two previous years, notwithstanding that, in 1876 and in 1875, the deaths of persons in the Paddington Hospitals were omitted. It is worthy, too, of record, that the census year, (1871), with an

enumerated population of 96,813, furnished more deaths, viz., 1,929, than did the year 1877, with an estimated population of 109,425, and a death-roll of 1,886. This favourable state of the public health has been attributed to the comparatively low temperature during the summer months, and to the excessive rainfall in the first three months of the year; but to medical science, and to the greater attention paid to sanitary matters, much of the improvement may be fairly ascribed.

DEATHS AND DEATH RATES.

It is satisfactory to notice the fewer deaths amongst children under one year, and under five years of age, (Table II.), and the diminished death-rate from zymotic diseases, (Table IV). The deaths of children under five years of age, whenever they happen, take place most frequently, not in hospitals or institutions either within or without the parish, but at their own homes, and their number can thus be ascertained with tolerable accuracy. Consequently in most communities such deaths, following in too many instances from preventible diseases, are a primary test both of the sanitary conditions, and to some extent of the comfortable surroundings of those homes. Last year 380 infants, or 13 per cent. of all that were born in the parish, died during their first year of life; and no fewer than 649, or 38 per cent. of all who died, were children under five years of age. Of this number 22 met with violent deaths.

As showing the urgent necessity of the most earnest endeavours to diminish the mortality of the infantile and juvenile population, it may be mentioned, that in the Metropolis generally, the deaths of infants under one year of age were 14·6 per cent. of the registered births, and of children under five years of age 41·3 per cent. of the total deaths.

ZYMOTIC DISEASES.

SMALL POX.

To those who were conversant with the vital statistics of the country, and had marked the tendency of certain diseases to prevail at intervals more extensively, or with unusual violence, and to exhibit other peculiarities as regards their modes of approach, progress, and disappearance—in other words, to assume an epidemic form—the recurrence of small-pox in such a form in the autumn of 1876 can have occasioned little surprise. To the Registrar-General it would not be a difficult matter, as regards some of those diseases, to predicate with tolerable accuracy the time of their appearance, the order of their occurrence, and the probable number of their victims during the next few years. This epidemic tendency, or influence, has long been observed in connexion with catarrhal and contagious eruptive affections, such as influenza, small pox, scarlet fever, measles, &c.

Various hypotheses, wholly destitute of proof, have been urged, by way of explanation, of the cause

or origin of this tendency. Generally it confines itself for a time to some one of these affections, it may be to small pox in one year, to scarlet fever in another, and to measles in a third; although not unfrequently epidemics of two diseases appear in the same community, and, whilst concurrent in point of time, may not be of equal intensity. The epidemic in one town may differ from that in another, and the same epidemic in different towns varies in some respects, whilst in the same town the death-rates from the prevailing epidemic, from unknown causes, fluctuate from week to week.

Of some of these diseases, thus liable to become epidemic, it may be said that they are always with us. Year after year they claim their complement of sufferers; and ever and anon, with something like cyclic regularity, they operate upon a wider field with startling capriciousness and with greater malignity.

The small pox epidemic of 1876-78 has been no exception to the rule. It followed that of 1871-72, which was preceded by those of 1866-67 and of 1863. The periods between those years were intervals of comparative exemption from the disease, and served as a gathering time for the accumulation of fresh material to be used up on the recurrence of the next epidemic. Such susceptible material was the train ready for the match. It was fuel prepared for ignition. As to the source of the material upon which epidemics of small pox depend for their existence, one has not to go far to find it. Those who had evaded the law in respect to

vaccination furnished their quota, infants whose vaccination for various reasons had been delayed supplied a considerable element; and, to the discredit of the profession, too large a portion was contributed by those who had been imperfectly vaccinated in infancy, and had not been subsequently re-vaccinated.

Accordingly, in the course of the four epidemics referred to, no fewer than 18,959 deaths occurred from a revolting but at the same time preventible disease.

*Deaths from Small Pox registered in London
during the last four epidemics.*

Years.	1863	1866	1867	1871	1872	1876	1877	1878
Deaths.	2,012	1,388	1,332	7,876	1,781	735	2,544	1,291
Total Deaths in each Epidemic.	2,012	2,720		9,657		4,570		

The deaths are reckoned to the end of August, 1878, as by that time the epidemic may be considered to have ceased.

A statement of the deaths registered in Paddington during the prevalence of the same epidemics would be of little value, as it is the duty of the Inspectors to get all cases removed to the Hospitals which are outside the parish with as little delay as possible.

In my report for the year 1876, I stated that during that year Small pox was extensively prevalent

in the Metropolis, and had occasioned 735 deaths ; that in Paddington it had caused 2 deaths, and that 25 patients were sent to the Hospitals, viz., 4 to the Small pox and Vaccination Hospital at Highgate, and 21 to the Hospitals of the Metropolitan Asylum Board. As one of the two deaths above referred to took place on the 9th November, and the other on the 19th December, and 20 of the 25 patients were sent to the Hospitals [subsequently to the 1st of November, the disease cannot be said to have begun to spread epidemically in Paddington before the end of October. As has been remarked in the case of other epidemics, Paddington enjoyed comparative immunity from the disease for some time after it had prevailed extensively in other parts of London.

In the course of the year under review (1877), Small pox caused in the Metropolis 2,544 deaths. Of the 15 deaths in Paddington, 14 were registered in St. Mary's sub-district, and 1 in St. John's. 164 patients, 133 from St. Mary's and 31 from St. John's, were conveyed to the Hospitals, viz., 17 to Highgate, 7 to the Hospital within the grounds attached to the Paddington Workhouse, and 147 to one or other of the Asylum Hospitals at Fulham, Hampstead, Homerton, and Stockwell.

The subjoined table supplies some indications of the progress and fluctuations of the disease in the two

sub-districts of the parish, from the appearance of the first case in 1876, to the end of July, 1878.

Date of removal to Hospital.	Number of Cases.	Removed from Sub-Districts.	
		St. Mary.	St. John.
1876.			
June	1	—	1
August	1	—	1
September	1	1	—
October	2	—	2
November	5	—	5
December	15	9	6
1877.			
January	12	5	7
February.....	11	8	3
March	13	11	2
*April	25	20	5
May	51	48	3
*June	25	23	2
*July.....	12	6	6
August	4	4	—
September	4	3	1
October	3	2	1
November	1	1	—
December	3	2	1
1878.			
January	11	8	3
February.....	11	9	2
March	7	7	—
April	11	8	3
May	9	3	6
June	7	4	3
July.....	6	4	2
Totals.....	251	186	65

* Fourteen of these cases were removed from the Canal Boats.

The number of registered deaths from this disease, and of patients sent to the hospitals, very imperfectly reveals the extent to which small pox at any time

prevailed in the parish. How many patients were treated at home, or how many 'mild cases,' the result of previous imperfect vaccination, capable nevertheless of spreading the disease, were not treated at all, must ever remain a matter of conjecture; and this uncertainty will continue to be the case in future epidemics, so long as the registration of infectious diseases is not made compulsory.

From measles, which existed as an epidemic in other parishes, from scarlet fever, diarrhœa, and typhoid fever, the deaths were fewer than in the previous year.

From whooping cough the deaths were far too numerous, being nearly 1 in 25 of the total deaths, an abnormal proportion attributable, there is every reason to believe, to the want of care in avoiding, during the progress of the disease, cold and damp, the causes of pectoral and other complications. The simple form of the disease is rarely fatal. Of the 69 children who succumbed to it, 54 lived in St. Mary's and 15 in St. John's sub-districts respectively. 50 of them were under two years of age; at which period of life it has been observed to be most fatal, probably on account of its occurring during dentition. All, with the exception of two or three, were the children of poor parents.

VACCINATION.

The interest felt by the public in vaccination, as a prophylactic measure against small pox, is evidenced by the letters and articles which have frequently

appeared in the daily press. As embodying my views upon this subject, I append a copy of a letter addressed by me to "*The Times*."

TO THE EDITOR OF "*The Times*".

"SIR,—In *The Times* of the 19th of January you allowed me to point out a ready means of isolation for preventing the spread of small pox in the northern half of the metropolis amongst persons above the pauper class. Perhaps you can find space for a few remarks regarding the means to be employed for protecting the community from that disease. I refer, of course, to vaccination and re-vaccination. From the information afforded by the Registrar-General's Weekly Returns of the causes of death, it may be fairly said that for some years vaccination has been on its trial. Jenner claimed for his discovery "the annihilation of small pox." Between the years 1798 and 1803 its value was tested upon thousands of persons, who, after vaccination, were subjected to inoculation with the virus of small pox, and subsequently, in very many instances, to the further ordeal of sharing the beds of those who were suffering from the disease.

"Woodville, at the Small Pox Hospital, repeated Jenner's experiments and endorsed his views. Medical men, with few exceptions, have everywhere adopted them. As a matter of fact, however, during the 28 years—1847-74 inclusive—144,042 persons died from small pox in England and Wales. Of these, many thousands were said to have been vaccinated, more were unvaccinated, and of the remainder the medical certificates gave no information as to vaccination. The question then occurs, Has vaccination proved a failure? Or, why this difference between promise and fulfilment? Or, whence these discrepant results? The answer to-day must be the same as that recorded 20 years ago by Marson, Simon, and other authorities:—Vaccination has often been inefficiently and insufficiently performed. The means which were employed were inadequate to the end which was desired.

"*As to inefficiency.*—In many cases of so-called successful vaccination, cow-pox, which the operation was intended to produce, and which Jenner recommended as a substitute for or a preventive of small pox, has never really occurred. The correctness of this statement has been shown both by the vesicles which followed the operation and by the subsequent cicatrices, neither of them presenting the required appearances. There are vesicles and vesicles. Those from a primary are very

different to those from a secondary vaccination. Your columns are not the place in which to describe their distinctive characters. The nettle, cow pox, was not sown ; the flower, safety, has not been plucked.

“As to insufficiency.—The insufficiency of vaccination, as it is frequently performed, is shown by a solitary cicatrix, instead of a *minimum* of four. In such cases the antidote has been too sparingly used, it has not affected the system with sufficient intensity to alter or destroy the susceptibility of the contagion. Mr. Marson tells us that, from a careful observation of 6,000 cases of small pox after vaccination, 21 $\frac{3}{4}$ per cent. died who were said to have been vaccinated, but whose arms showed no cicatrix, 7 $\frac{1}{2}$ per cent. died with one cicatrix, 4 $\frac{1}{8}$ per cent. with two cicatrices, 1 $\frac{3}{4}$ per cent. with three cicatrices, and only $\frac{3}{4}$ per cent. of those with four or more cicatrices. Of the unvaccinated who are attacked, we know that 35 $\frac{1}{2}$ per cent. is the ordinary rate of mortality. It is certain that both quality and quantity in the matter of vaccine lymph are necessary to secure exemption from small pox.

“The knowledge that many persons have been imperfectly vaccinated, and are, therefore, unprotected, and the fact that persons properly vaccinated, even by Jenner himself, have in after life suffered from small-pox, suggest the necessity of re-vaccination. Arguments in favour of it derive force from the additional fact that when vaccination has been properly performed, and followed in due course by re-vaccination, almost absolute immunity is obtained. Mr. Marson’s statement, in 1871, before the Select Committee on the Vaccination Act (1867) cannot be too publicly made known :—‘In the 35 years during which I have been at the Small Pox Hospital, I have never had a nurse or a servant the whole time who has taken small pox there. I re-vaccinate them when they come there, and they never have small pox, although they are exposed to infection every day.’ This testimony has been fully corroborated by Dr. Seaton.

“Practical Measures.--1. Make re-vaccination compulsory at puberty. It is between 15 and 25 years of age that the deaths from small pox after vaccination are the the most numerous. The enforcement of the rule suggested some years ago by Dr. Seaton—viz., ‘The re-vaccination of persons as they reach 15 years of age should be as systematically done as is the vaccination of young infants’—would be the means in future epidemics of saving the lives of thousands of persons not only of the above period of life, but of all ages.’

“2. Require forthwith all persons, irrespective of age, to be re-vaccinated, whose maintenance, whether for a longer or shorter period, is

derived from funds raised by local or imperial taxation or for charitable purposes. This would embrace the inmates of all homes, hospitals, penitentiaries, prisons, reformatories, schools, unions, and such like institutions—the class which, sooner or later, furnishes the majority of persons attacked by this and other contagious diseases. This class, moreover, can be dealt with without waiting for an Act of Parliament. To the Government we may safely leave the care of the Army and Navy.

“3. Let our ordinary seamen be required, when engaged, to produce a certificate of re-vaccination, and let domestic servants, when applying for a situation, produce a similar certificate. These provisions are the more necessary, as it is well known that sailors have often carried contagion to our sea ports, and that in the households of the upper and well-to-do middle classes the servants are the persons most frequently affected. As vaccination from arm to arm is the most efficient, though few private practitioners can in this manner meet their requirements—and as the lymph contained in tubes is sometimes mixed with blood or pus, to be seen only by the microscope, or has deteriorated from the tubes having been imperfectly sealed, and so a comparative failure of the operation frequently results—let the public vaccinator of every district vaccinate from a child at his own house on a certain day those who are willing to pay him his fee, and do not care to go to the public vaccine station. Few cases—probably none—of insusceptibility of vaccination will then be reported.

“When vaccination, and in due course re-vaccination, have been properly performed, it will be time enough to ask if, dazzled by its brilliancy, Jenner expected too much from his discovery, and to note whether or not with laggard step promise is followed by performance.

“I am, Sir, your obedient Servant,

“JAMES STEVENSON, M.D.,

“*Medical Officer of Health for Paddington.*

“VESTRY HALL, HARROW ROAD;

“*April 3rd, 1877.*”

Testimony confirmatory, if confirmation be needed, of the correctness of Marson's statistics, and of the power of vaccination and of re-vaccination to control the course of the disorder and to lessen its mortality—

not to speak of their immeasurably more frequent effect, that of preventing altogether the occurrence of small pox—is *especially, uniformly, and abundantly* furnished by the reports of the medical officers of every hospital established in the Metropolis and in the provinces for the treatment of that disease during the recent and preceding epidemics. In truth, the protection afforded by successful re-vaccination is greater than that imparted by a previous attack of small pox, either natural or inoculated. It cannot be too generally known, that it is more common for a person to have small pox a second time, than to have it after successful vaccination and re-vaccination; and that, whereas fatal cases of secondary small pox, as of other contagious affections, do from time to time occur, the disease after successful re-vaccination is invariably mild. Of nearly 15,000 cases of small pox treated in the London hospitals during the epidemic of 1871-72, there were 4 only which presented proofs of having been re-vaccinated, and they were all mild cases.

To those who remember the scarred features of a former generation, further testimony of the priceless value of vaccination is borne and silently proclaimed alike by the all but universally unmarred countenances, and by the very few disfigured faces, now to be seen in our streets.

I have little to add to the foregoing observations, supported as they are by the unequivocal testimony of facts, and enforced by the sad, and the stern, and the irrefragable logic of events. The virus of small pox

has lost none of its deadly power. Uncontrolled by vaccination, the disease is as capable in our time, as during the last century, of extending, nay, of multiplying its ravages ; since there are in the present day larger areas of population, and greatly increased facilities of communication between persons and places.

Believing that to the community of mankind, whatever may be its sanitary conditions, vaccination, when properly performed, is with rare exceptions an effectual safeguard against small pox, however great may be its intensity ; and knowing as a matter of fact, that, despite Compulsory Vaccination Acts, thousands on an average annually perish from that disease—not to speak of the disfigurement, the blindness, the deafness, the incurable weakness, and other irreparable evils it too often entails—for reasons which I cannot here particularize, I am of opinion,

1.—That the time allowed by law for the vaccination of infants might with advantage be reduced.

2.—That vaccination with preserved lymph should be discouraged, and that only ‘ arm to arm ’ vaccination, save in exceptional instances, should be recognised.

3.—That the performance of vaccination should be restricted to public vaccinators appointed, paid, and systematically supervised by the State.

Details are matters for administrative arrangement.

All have a common interest in the prevention of infectious diseases. With this re-adjustment of the

mechanism of vaccination, it may fairly be hoped that the goal which is the desire of every sanitarian will in time be reached, that of *a vaccinized and therefore protected population*. To bring about this result may be the business of a Department, to accomplish it would be an effort worthy of the State. It is alike its duty and its interest, and would carry with it its own reward; inasmuch as the safety of a kingdom is not in disconsolate homes, or in a population decimated by the wars, pestilence or famine which an enlightened and energetic legislature could prevent, but in the happiness and "in the multitude of people" wherein "is the King's honour."

Table VII., supplied by the Vaccination Officer, Mr. Dudman, shows to what extent the law as regards the vaccination of infants is carried out in Paddington. Of the 186 infants returned as unvaccinated, in consequence of their removal to other places, there is reason to believe that only a fraction will eventually escape the operation, as it is the duty of every Vaccination Officer to look after, not merely the children born in his district, but also those who may have been removed into it.

The "Supplemental Return for 1876" shows, that of the 2,905 children whose births were registered during that year, 2,463 were successfully vaccinated; and that of the remainder there were 142, or less than 5 per cent. of the total number, of whom the Vaccination Officer could give no account. In Scotland and in sparse populations, a smaller percentage of lapsed cases

has been obtained ; but in the larger English towns, in consequence of the migratory habits of the lower classes, and other circumstances, a much less percentage or proportion can scarcely be expected.

HOSPITAL ACCOMMODATION FOR THE INFECTIOUS SICK.

This, in relation to persons above the pauper class, is a subject which has again and again received much attention from the Sanitary Committee. With the recurrence of each epidemic, more particularly of small pox, the necessity for its consideration has arisen. As the Vestries and District Boards of the Metropolis have recently remitted the question to a Conference of Delegates from the Local Authorities, and there appears to be a general agreement of opinion respecting it, the prospect of a satisfactory settlement is less remote than at one time seemed probable.

SANITARY WORK.

This, as done by the Inspectors, is only in part shown in Table VI. As usual, much of their time was occupied in the investigation of the complaints of parishioners, in the direction and supervision of the reconstruction of house-drains, in the removal of infectious cases, and in the subsequent disinfection of apartments, clothing, &c. During the year, upwards of twelve tons, for the most part of bedding, were by their directions removed, cleansed, and disinfected.

by the Vestry cleaners at the expense of the parish. A still larger quantity was similarly dealt with by the Inspectors at the expense of the owners. In this parish for some years past, by the authority of the Vestry, the infected bedding of the poor is not simply disinfected, as in some parishes, it is also cleaned, made up anew, and returned to them in a presentable and wholesome condition. Disinfectants and carbolic soap are freely dispensed by the Inspectors to the poor. So satisfactorily is the work of disinfection done, both by Inspectors and Vestry Cleaners, that in no instance so far as I am aware, has infectious disease reappeared in any apartment or premises, as a consequence of the incompleteness of the processes to which such premises, with their contents, have been subjected.

WATER.

Paddington, it will be remembered, is supplied with water by the Grand Junction and West Middlesex Companies, which, again, obtain their supplies from the Thames, as do the Chelsea, the Southwark, and the Lambeth Companies. Of the five Companies named, the West Middlesex, as usual, delivered the best water, and the Southwark Company the worst. Other Companies, from other sources, contribute to the supply of water to the inner and portions of the outer circle of the Metropolis.

Although, on the whole, the year 1877 was, like 1876, very favourable for the river waters, nevertheless, "in the months of January, April, and December, the Thames water was delivered to consumers in such a

polluted condition as to be utterly unfit for dietetic purposes " The Lea water delivered by the East London, and in part by the New River Companies, was as usual much better than that drawn from the Thames ; but in January this water was also unfit for domestic use. The New River Water was better than that of the East London Company.

The average daily quantity of water supplied by the London Companies, during the year 1877, was 120,864,496 gallons, of which nearly 61 million gallons were sometimes much polluted with sewage matter ; upwards of 52 million gallons were occasionally so polluted, but to a much less degree ; whilst 7,230,993 gallons were of unexceptionable quality.

The quantity of water used for extinguishing fires during 1877 was rather more than $14\frac{1}{2}$ million gallons, or about 65,400 tons. About one half of this quantity was taken from the river, canals, and docks, and the remainder from the street pipes.

Variations of temperature, according to the season, were observed in the river waters, ranging through no less than $25^{\circ}.7$ Fahr. At the highest temperature in August the water was vapid and unpalatable. The range of temperature in the deep well waters of the Kent and Colne Valley Companies was much less, being only $13^{\circ}.0$ Fahr., and the water was never unpalatable.

Of the solid matters contained in the water, and composed of a great variety of substances, the largest proportion was entirely harmless when the water was used for dietetic purposes ; but as such water is usually

rendered hard by the presence of these matters, it is decidedly injurious when used for washing.

A small proportion consisted of organic substances, always objectionable, and at times, when present in river water, dangerous to health.

The pollution of the Thames and Lea is to a great extent of animal origin. The deep-well water supplied by the Kent Company is unaffected by animal or vegetable life. The natural filtration which the Kent Colne Valley and Tottenham deep well waters undergo through an enormous thickness of chalk, renders artificial filtration unnecessary, and is the cause of their almost uniform clearness and transparency.

It is admitted that, during the past ten years, there has been a diminution of organic impurity in Thames water delivered in London. That this improvement is owing to the more careful treatment of the water by the Companies is shown by the fact that, in the water supplied and inefficiently treated by the Southwark Company during a great part of the year 1877, the proportion of organic impurity was excessive. There is no abatement, however, of the evidence of previous sewage contamination in the Thames and Lea waters: hence the likelihood of morbid matter derived from animal excreta being distributed to the customers of the respective companies drawing their water from those sources.

The opinion of the late River Commissioners, in their Report on the Domestic Water Supply of Great Britain deserves consideration. "We consider that

potable water, which contains organic matter even only partially derived from animal sources, should not yield much more than 0.1 part of organic carbon in 100,000 parts of water." The maximum pollution in the Thames water from the presence of organic elements, consisting chiefly of organic carbon, greatly exceeded this standard, whilst that of the Lea was also always considerably above it.

For many of the preceding remarks, as well as for the annexed tables shewing the condition of the London Waters, I am indebted to Dr. Frankland's Annual Report to the Registrar-General.

To remedy the existing defects, both as regards the mode of supply and the quality of the water, and also in order to have at hand at all times a readily available and sufficient quantity for the extinction of fires, two bills, called, "The Water Companies' Purchase Bill," and "The Metropolis Water Supply Bill," were introduced into the House of Commons during the last Session by the Metropolitan Board of Works, but owing to the very strenuous opposition, which for various reasons they there encountered, they were subsequently withdrawn by the promoters.

It appears to me that the source of a suitable supply of water to the Metropolis has yet to be discovered.

I have the honour to be, GENTLEMEN,

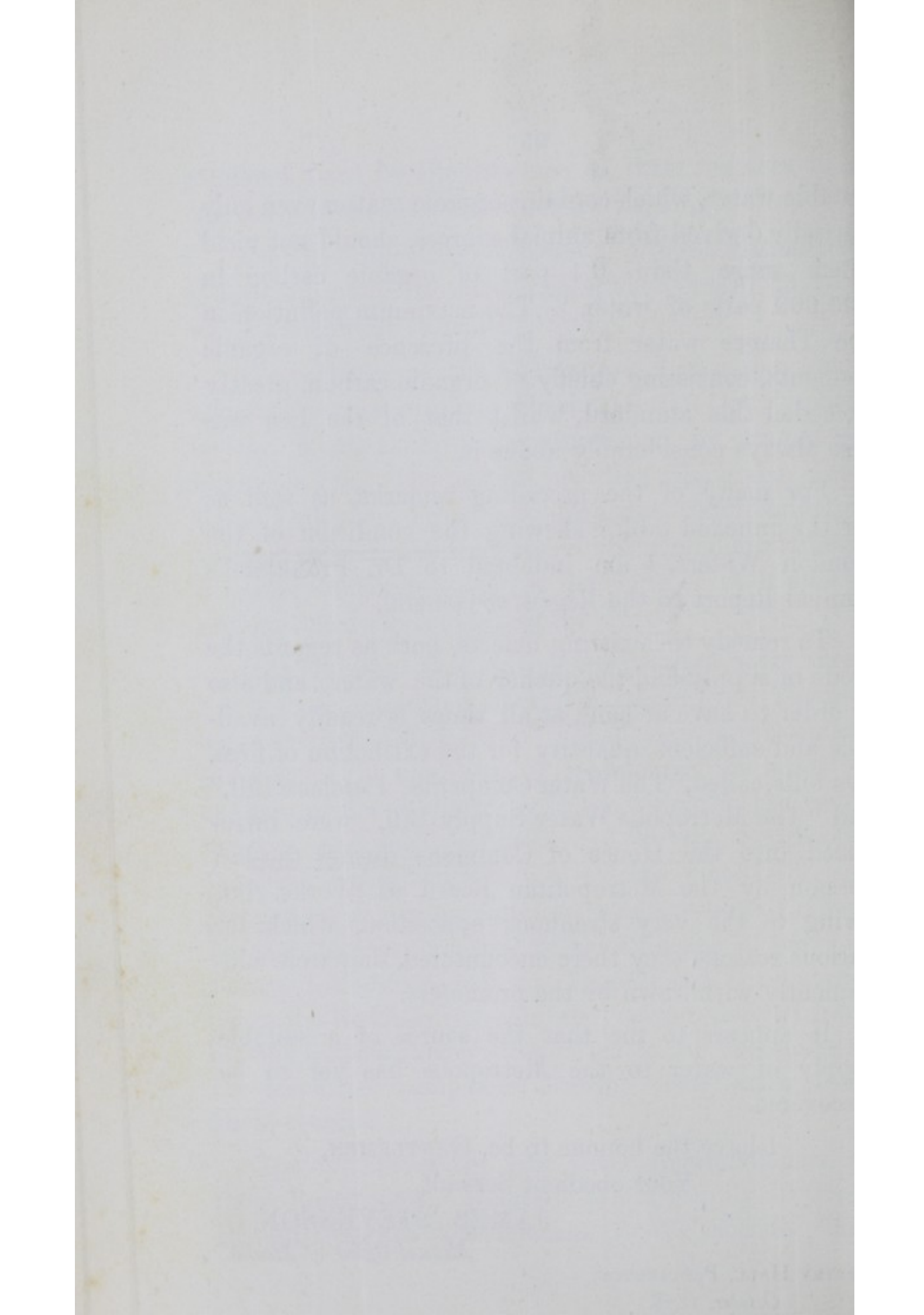
Your obedient Servant,

JAMES STEVENSON,

Medical Officer of Health.

VESTRY HALL, PADDINGTON,

October, 1878.



TABLES.

TABLE 12

TABLE I.

Table showing the Population, Inhabited Houses, Births, and Deaths,
for the Year 1877 and 10 years preceding.

GROSS NUMBERS.

Year.	Estimated Population.		Number of Inhabited houses in the Parish.	Registered Births.		Deaths.	
	St. Mary.	St. John.		St. Mary.	St. John.	St. Mary.	St. John.
1877.	70,554	38,871	13,032	2,226	695	1,220	486
1876	68,583	38,740	12,898	2,177	728	12,75	471
1875	66,612	38,609	12,746	2,179	748	1,368	487
1874	64,641	38,478	12,596	2,213	733	1,282	684
1873	62,670	38,347	12,456	2,097	734	1,278	688
1872	60,699	38,216	12,247	2,094	743	1,120	640
1871	58,728	38,085	12,011	2,073	718	1,260	669
1870	56,757	37,954	11,744	1,920	775	1,282	661
1869	54,786	37,823	11,473	1,980	745	1,111	657
1868	52,815	37,692	11,476	1,968	797	1,109	663
1867	50,844	37,561	10,863	1,882	753	1,180	629
Average of 10 years, 1867—1876.	59,714	38,151	12,051	2,058	747	1,227	625

NOTES.

1. *Population at Census 1871—96,813.*
2. *Area in acres—1,280.*
3. *Average No. of Persons in each house at Census 1871—8.1.*

* For statistical purposes the Registrar-General estimates the population to the middle of the year on the basis of the rate of increase ruling between the two preceding Census periods. The estimate of population may be checked by the known number of inhabited houses, and by the average number of inmates per house, as ascertained at the preceding Census.

The deaths of *non-parishioners* in the public institutions (St. Mary's Hospital and the Lock Hospital) within the parish are deducted for the year 1877. For the years 1875 and 1876 the *total* deaths in the above-mentioned institutions are deducted.

TABLE II.

Table showing the Annual Birth Rate, Rate of Mortality, Death Rates among Children, and Deaths in Public Institutions, for the Year 1877 and 10 Years preceding.

	Birth Rate per 1000 of the Population.	Annual Rate of Mortality, per 1000 living.	Deaths of Children under 1 year : per centage of Total Deaths.	Per centage of Deaths of Children under 1 year to Registered Births	Deaths of Children under 5 years : per centage of Total Deaths.	Total Number of Deaths in Public Institutions.	
						Saint Mary's Hospital.	The Lock Hospital.
1877.	26.7	15.6	22.3	13.0	38.0	224	5
1876	27.0	16.3	23.7	14.3	39.0	219	1
1875	27.8	17.6	22.3	14.1	38.4	141*	3
1874	28.6	19.1				214	1
1873	28.0	19.5				198	7
1872	28.7	17.8				178	5
1871	28.8	19.9				192	2
1870	28.5	20.5				178	10
1869	29.4	19.1				187	5
1868	30.6	19.6				209	7
1867	29.8	20.5				172	3
Average of 10 years, 1867-1876.	28.7	19.0				189	4

* This Hospital was closed during a portion of this year.

NOTE.—The Deaths in Public Institutions of non-Residents are excluded.

Cause of Death.	AGES.																	Total under 5 Years	Total
	0 to 1	1 to 2	2 to 5	5 to 15	15 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85	85 to 95	95 and up-wards						
	1	2	5	15	25	35	45	55	65	75	85	95							
CLASSES.																			
I. ZYMOTIC DISEASES.....	103	82	82	59	10	39	9	4	11	4	3	1	..	207	298				
II. CONSTITUTIONAL DISEASES.....	20	22	23	20	22	48	39	23	22	3	1	..	..	74	311		
III. LOCAL DISEASES.....	124	54	36	20	16	49	66	89	137	143	76	15	1	216	828				
IV. DEVELOPMENTAL DISEASES.....	105	22	..	1	3	..	4	1	2	18	30	22	3	127	210				
V. VIOLENT DEATHS.....	16	1	5	2	5	2	6	1	3	4	3	..	..	22	47		
Not specified or ill defined.....	2	..	1	..	..	1	1	1	2	3	1	..	..	2	12
TOTALS.....	360	192	117	73	66	119	134	134	178	194	116	39	4	649	1706				
CLASS I.																			
ZYMOTIC DISEASES.																			
Order 1.—Miasmatic.																			
1. Smallpox.....	3	1	2	3	2	3	1	..	..	..	..	..	..	6	15
2. Measles.....	10	16	11	1	..	..	1	..	..	..	..	..	..	37	39
3. Scarlet Fever (Scarlatina).....	..	3	14	12	2	1	..	..	..	..	..	..	..	17	32
4. Diphtheria.....	2	2	2	4	..	1	..	..	..	..	..	..	..	6	11
5. Quinsey.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6. Crup.....	1	3	5	3	..	..	..	..	..	..	..	..	..	9	11
7. Whooping Cough.....	28	22	17	2	..	..	..	..	..	..	..	..	..	67	69
8. Typhus Fever.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
9. Typhoid or Typhoid Fever.....	..	..	1	1	2	5	1	..	..	1	..	..	..	1	1
10. Single continued Fever.....	1	..	..	..	..	..	1	..	3	..	1	..	..	1	1
11. Erysipelas.....	..	..	..	..	..	2	..	..	..	..	..	..	..	..	2
12. Carbuncle.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
13. Influenza.....	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1
14. Dysentery.....	..	..	1	..	..	..	1	2	2	1	..	..	..	3	3
15. Diarrhoea.....	49	3	..	..	..	1	1	..	2	2	..	1	1	43	60	
16. Choleraic Diarrhoea.....	1	..	..	..	..	..	..	1	..	..	..	..	..	1	2
17. Ague.....	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1
18. Remittent Fever.....	..	..	..	..	..	2	2	1	1	..	..	..	..	..	2
19. Rheumatism.....	..	1	..	3	1	3	1	..	2	..	..	..	..	1	11
20. Other Zymotic Diseases.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Order 2.—Etiologic.																			
1. Syphilis.....	14	..	..	..	..	..	..	..	..	..	..	..	..	14	14
2. Stricture of Urethra.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3. Hydrophobia.....	..	..	..	..	..	..	..	1	..	..	..	..	..	..	2
4. Glanders.....	..	..	..	..	1	..	..	1	..	..	..	..	..	..	2
Order 3.—Dietic.																			
1. Privation.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2. Want of Breast Milk.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3. Purpura and Scoury.....	..	1	..	..	..	..	..	..	1	..	..	..	..	1	2
4. Alcoholism (a. Del. Tremens).....	..	..	..	..	1	1	1	1	..	..	..	..	..	..	4
Order 4.—Parasitic.																			
1. Thrush.....	3	..	..	..	..	..	..	..	1	..	..	..	..	3	4
2. Worms, &c.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
II.																			
CONSTITUTIONAL DISEASES.																			
Order 1.—Diathetic.																			
1. Gout.....	..	..	..	1	..	..	..	1	1	2	..	..	..	..	1
2. Dropsy.....	..	..	1	..	..	..	..	..	..	2	1	..	..	..	3
3. Cancer.....	..	..	1	1	2	9	12	15	12	2	1	..	..	..	50
4. Cancerous Oria (Noma).....	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..
5. Morbidities.....	..	..	..	..	..	..	..	..	1	1	..	..	..	..	2
Order 2.—Tubercular.																			
1. Scrophula.....	..	1	4	..	4	..	..	..	..	..	..	..	..	5	9
2. Tubercularis.....	16	4	1	1	..	..	..	..	..	..	..	..	..	21	22
3. Phthisis.....	5	1	2	12	26	46	39	26	6	6	..	..	..	8	109	
4. Hydrophalus.....	9	15	16	6	1	..	..	..	..	..	..	..	..	69	46
III.																			
LOCAL DISEASES.																			
Order 1.—Nervous System.																			
1. Cephalitis.....	..	..	..	2	..	1	1	..	7	19	3	..	..	..	4
2. Apoplexy.....	..	..	..	..	..	..	4	7	7	..	..	..	..	..	31
3. Paralysis.....	..	..	..	..	..	1	3	5	7	14	11	1	1	..	43
4. Insanity.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
5. Clonus.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6. Epilepsy.....	..	..	1	..	2	1	2	..	..	..	1	..	..	..	7
7. Convulsions.....	44	9	7	3	1	..	..	..	..	..	..	..	..	60	64
8. Brain Disease, &c.....	2	1	3	3	1	2	6	5	5	2	4	1	..	6	31				
Order 2.—Organs of Circulation.																			
1. Pericarditis.....	..	..	..	..	1	..	2	1	1	..	1	..	..	..	4
2. Anoxia.....	..	..	..	..	..	2	2	1	..	..	..	..	..	..	5
3. Heart Disease, &c.....	1	1	..	3	2	19	11	28	35	28	11	4	..	2	131				
Order 3.—Respiratory Organs.																			
1. Laryngitis.....	8	2	1	..	..	1	3	1	1	..	..	..	..	11	17
2. Bronchitis.....	39	21	9	2	..	1	14	32	42	28	8	..	..	69	210		
3. Pleurisy.....	..	..	..	..	..	..	..	..	4	1	..	..	..	..	..
4. Pneumonia.....	29	19	13	3	1	11	3	3	11	7	3	1	..	82	95				
5. Asthma.....	..	..	..	..	..	..	..	1	3	1	3	..	..	..	4
6. Lung Disease, &c.....	3	2	..	1	2	2	3	3	4	1	3	..	..	5	25		
Order 4.—Digestive Organs.																			
1. Gastritis.....	..	..	1	..	1	..	1	2	..	..	..	..	..	..	4
2. Enteritis.....	..	1	..	2	..	1	1	1	..	1	1	..	..	1	15		
3. Peritonitis.....	..	1	..	2	..	..	..	..	..	..	..	..	..	..	3
4. Ascites.....	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1
5. Obstruction of Intestines.....	..	..	..	..	..	..	..	1	1	1	..	..	..	..	4
6. Hæmorrhoids.....	..	..	..	..	..	..	..	1	1	..	..	..	..	..	1
7. Bile.....	..	1	..	..	..	..	1	5	1	..	3	..	..	1	10
8. Intemperance.....	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1
9. Stricture of Intestines.....	..	..	..	..	1	..	..	1	..	..	..	..	..	..	2
10. Typhus.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
11. Stomach Disease, &c.....	..	..	..	..	..	2	..	..	1	..	..	..	..	..	3
12. Puerperal Disease, &c.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
13. Hepatitis.....	..	1	..	..	..	..	..	2	6	1	..	..	..	1	9
14. Jaundice.....	1	..	..	..	..	..	..	2	2	1	..	..	..	1	6
15. Liver Disease, &c.....	..	..	..	..	1	3	2	2	1	..	..	..	..	1	10
16. Spleen Disease, &c.....	..	..	1	..	..	..	2	1	..	..	..	..	..	..	4
Order 5.—Urinary Organs.																			
1. Nephritis.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
2. Ischuria.....	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1
3. Bright's Disease (Nephritis).....	..	..	..	1	6	4	2	5	5	1	..	..	..	..	24
4. Diabesis.....	..	..	..	..	1	2	1	1	2	1	..	..	..	..	5
5. Calculus (Stone).....	..	..	..	..	..	..	..	2	..	..	..	..	..	..	2
6. Cystitis.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
7. Kidney Disease, &c.....	..	..	..	1	2	1	1	..	2	..	..	..	..	..	7
Order 6.—Organs of Generation.																			
1. Ovarian Dropsy.....	..	..	..	..	..	1	2	2	1	1	..	..	..	..	6
2. Uterine Disease, &c.....	..	..	..	..	..	1	..	1	1	..	..	..	..	..	3
Order 7.—Organs of Locomotion.																			
1. Synovitis (Arthritis).....	..	..	..	..	..	1	..	..	..	..	..	..	..	..	2
2. Joint Disease, &c.....	..	..	..	..	1	..	1	..	..	..	..	..	..	..	2
Order 8.—Integumentary System.																			
1. Phlegmon.....	..	..	..	..	..	1	2	..	2	..	..	..	..	..	5
2. Ulcer.....	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1
3. Skin Disease, &c.....	2	..	..	..	..	..	..	..	..	..	..	..	..	2	2
IV.																			
DEVELOPMENTAL DISEASES.																			
Order 1.—Diseases of Children.																			
1. Premature Birth.....	36	..	..	..	..	..	..	..	..	..	..	..	..	36	36
2. Cynosis.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3. Spina Bifida.....	..	..	..	..	..	..	..	..	..	..	..	..	..	4	4
4. Other Malformations.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
5. Twisting.....	10	15	..	..	..	..	..	..	..	..	..	..	..	25	25
Order 2.—Adults.																			
1. Puerperia.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7
2. Childbirth (Complicated).....	..	..	..	..	3	..	4	..	..	..	..	..	..	..	7
Order 3.—Old People.																			
1. Old Age.....	..	..	..	..	..	..	..	..	2	18	29	22	3	..	74
Order 4.—Nutrition.																			
1. Atrophy and Debility.....	53	4	..	1	..	..	..	..	..	1	..	..	..	59	61
V.																			
VIOLENT DEATHS.																			
Order 1.—Accident or Negligence.																			
1. Fractures and Contusions.....	1	..	2	..	2	1	4	1	1	4	3	..	..	4	20		
2. Wounds (Gunshot).....	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1
3. Cuts, Stab.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
4. Burns and Scalds.....	..	..	2	..	1	..	..	..	..	..	..	..	..	2	3
5. Poison.....	..	..	..	..	..	..	..	..	..	..	..



Deaths Registered at several groups of ages from Different Causes during the Year 1877

NOTE.—The Deaths in Public Institutions of Non-Residents are excluded.

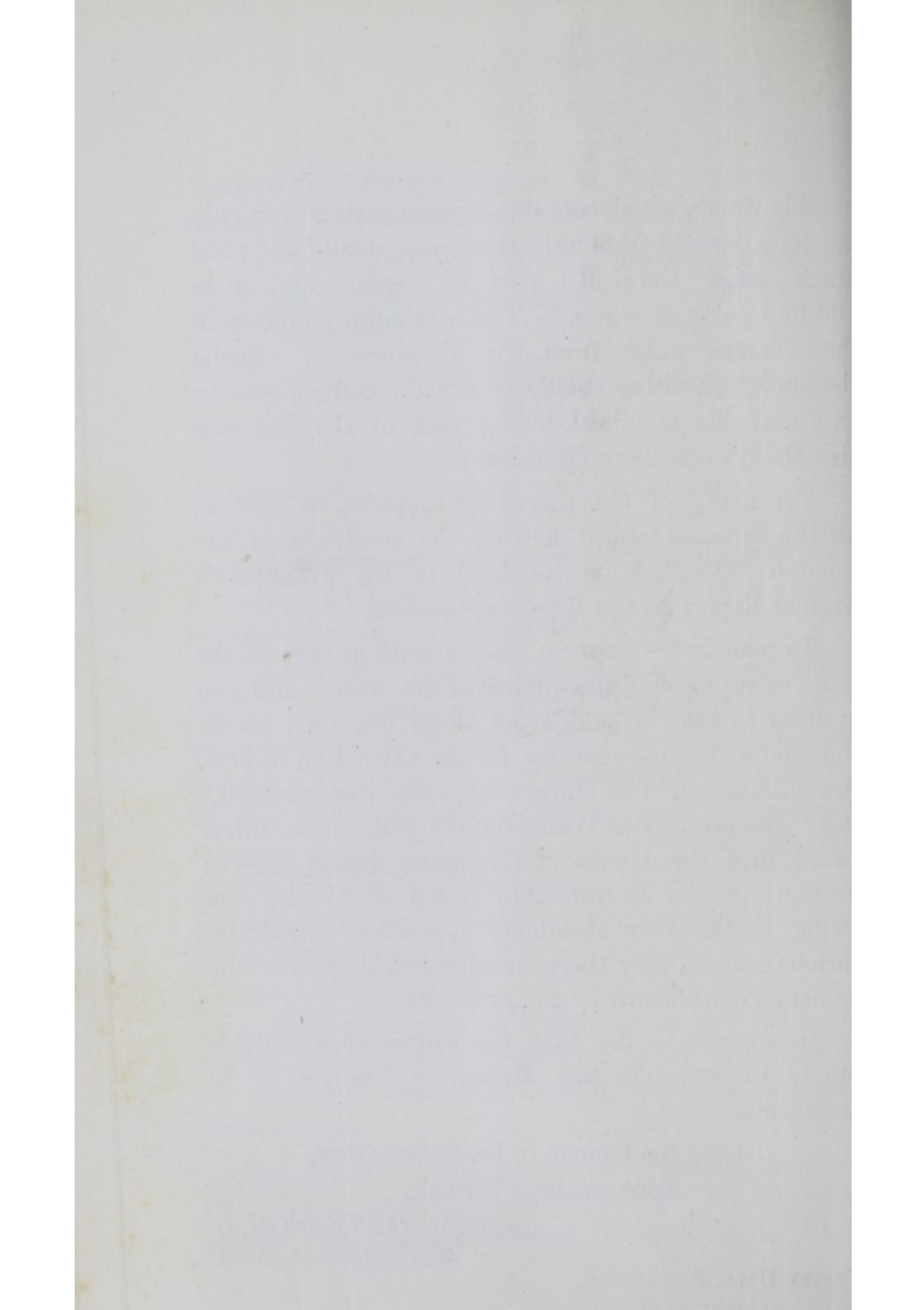


TABLE IV.

Table shewing the Mortality from certain classes of Diseases, and proportions to Population, and to 1000 Deaths, 1877.

	Total Deaths	Deaths per 1,000 of Population.	Proportion of Deaths to 1,000 Deaths.
1. Seven Principal Zymotic Diseases	227	2 · 1	133 · 06
2. Pulmonary Diseases (other than <i>Phthisis</i>)	355	3 · 2	208 · 09
3. Tubercular Diseases	202	1 · 8	118 · 41
4. Wasting Diseases of Infants.....	97	9	56 · 86
5. Convulsive Diseases of Infants.....	138	1 · 3	80 · 89

NOTES.

1. Includes Small pox, Measles, Scarlet Fever, Diphtheria, Whooping Cough, Fever, and Diarrhœa.
3. Includes *Phthisis*, Scrofula, Rickets, and Tabes.
4. Includes Marasmus, Atrophy, Debility, want of Breast Milk, and Premature Birth.
5. Includes Hydrocephalus, Infantile Meningitis, Convulsions, and Teething.

TABLE V.

Table showing the Number of Deaths from the seven principal Zymotic Diseases, in the 10 Years 1867 to 1876, and in the Year 1877.

Disease.	1867.	1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.	1876.	Annual Average of 10 years, 1867—1876.	Proportion of Deaths to 1000 Deaths in 10 years, 1867—1876.	1877.	Proportion of Deaths to 1000 Deaths in 1877.
Small pox									2	2			15	8·8
Measles									11	91			39	22·9
Scarlet Fever									108	35			32	18·8
Diphtheria									9	9			11	6·4
Whooping Cough									63	60			69	40·4
Fever									22	19			11	6·4
Diarrhœa									68	70			50	29·3
Total, PADDINGTON.									283	286			227	133·1
LONDON	11,817	14,797	17,476	16,489	19,454	12,722	11,226	11,327	13,411	12,565	14,128	185	12,292	160
ENGLAND & WALES	72,587	97,352	91,379	100,527	103,801	91,743	70,402	88,200	82,333	75,506	87,383	173	Not published.	

TABLE VI.

Inspectors' Report of the Sanitary Work, &c., completed in the year ending March 25, 1878.

Total	Paddington.		Results of Inspection.			House Drains.		Privies and W.C's.			Dustbins.		Water Supply.		Miscellaneous.			Regularly Inspected.			
	No. of Complaints received during the year.	No. of Houses, Premises, &c., inspected.	Orders issued for Sanitary Amendments of Houses and Premises.	Houses and Premises, &c., Cleansed, Repaired, and Whitewashed.	Houses Disinfected after Infectious Diseases.	Repaired, Cleansed, &c.	Trapped or Ventilated.	Repaired, Cleansed, &c.	Supplied with Water.	New provided.	New provided.	Repaired, Covered, &c.	Cisterns (new) erected.	Cisterns Cleansed, Repaired, and Covered.	No. of Lodging Houses registered under 35th Clause of Sanitary Act, 1866.	No. of Dust Complaints received and attended to.	Removal of accumulation of Dung, Stagnant Water, Animal, and other Refuse.	Removal of Animals improperly kept.	Bakehouses.	Licensed Cowhouses.	Licensed Slaughterhouses.	Other Proceedings, e.g. Legal Proceedings.
1,135	5,420	1,030	655	359	425	190	145	145	29	20	90	40	96	None.	—	18	5	83	13	23	—

TABLE VII.

Return respecting the Vaccination of Children whose Births were registered during the year 1877.

	Registration Sub-Districts comprised in the Vaccination Officers' Districts.	Number of Births returned in the Birth-List Sheets, as Registered from 1st January, to 31st December, 1877.	Successfully Vaccinated.	Insusceptible of Vaccination.	Had Small Pox.	Dead—Un-Vaccinated.	Postponed by Medical Certificate.	Removal to Districts, the Vaccination Officer of which has been duly apprized.	Removal to Places unknown, or which cannot be reached; and cases not having been found.	Prosecutions.
1	St. Mary ..	2,207	1,765	7	..	170	87	26	147	5 who have been fined 20s. and 2s. costs each.
2	St. John ..	700	595	3	..	37	24	2	39	
	TOTAL	2,907	2,360	10		207	111	28	186	

TABLE A.

Number of occasions when moving organisms were found :—

	1869.	1870.	1871.	1872.	1873.	1874.	1875.	1876.	1877.
Kent	0	0	0	0	0	0	0	0	0
West Middlesex .	0	0	0	0	0	0	0	0	0
New River	0	0	0	0	1	1	0	0	1
East London.....	4	3	3	1	0	2	0	0	0
Chelsea	3	2	2	3	2	5	4	4	1
Grand Junction.	4	1	1	2	3	5	7	3	3
Lambeth	5	0	4	6	3	4	5	4	1
Southwark	8	1	4	1	2	5	5	7	5
Colne Valley ...	—	—	—	—	—	—	—	—	0
Tottenham	—	—	—	—	—	—	—	—	0

The sediment deposited by turbid water on standing, when examined by the microscope, is almost always found to contain numbers of living and moving organisms.

TABLE B.

Taking the mean proportion of organic impurity in the Thames water delivered in London in 1868 as 1,000, in the subsequent years the following proportions were present respectively in the Thames water, and in the Lea water, the latter being delivered by the New River and East London Companies : —

Year.	Proportion of organic impurity present in Thames water as delivered in London.	Proportion of organic impurity present in Lea water as delivered in London.
1868.....	1,000	484
1869.....	1,016	618
1870.....	795	550
1871.....	928	604
1872.....	1,243	819
1873.....	917	693
1874.....	933	583
1875.....	1,030	751
1876.....	903	562
1877.....	907	596

TABLE C,

Table showing the efficiency of filtration of Thames and Lea water, also the maximum, minimum, and average proportions of organic impurity in the water delivered by the different Companies during the year 1877.

The water of the Kent Company contains the smallest proportion of organic matter, and as the standard of comparison is represented in the table by an unit.

Names of Companies and Sources.	Number of occasions when clear and transparent.	Number of occasions when slightly turbid.	Number of occasions when turbid.	Number of occasions when very turbid.	Maximum.	Minimum.	Average.
<i>Thames.</i>							
West Middlesex,	12	0	0	0	6.0	1.2	3.4
Grand Junction.	7	4	1	0	6.9	1.4	3.6
Lambeth	8	4	0	0	6.0	1.8	3.6
Chelsea.....	10	2	0	0	7.0	1.9	3.9
Southwark	7	0	4	1	8.0	1.5	4.2
<i>Lea.</i>							
New River	11	1	0	0	5.0	0.7	2.2
East London ...	12	0	0	0	5.1	0.7	2.6
<i>Deep Wells.</i>							
Kent	12	0	0	0	1.4	0.6	1.0
Colne Valley ...	10	1	1	0	4.2	0.4	1.4
Tottenham	11	1	0	0	1.4	0.2	0.5