

"This extraordinary mortality among the class of tradesmen in the parish of Shoreditch corroborates, in a surprising manner, the proof adduced by Mr. Chadwick, in the tables calculated from the Mortuary Returns, of the unhealthiness of different localities, and the pressure with which the local deleterious influences bore upon the different classes of society.

"Thus it was shown, in the tables referred to, that the average age at death of all who died above the age of 21 years, in the parish of Shoreditch, was—

	Among the Class		
	Gentry.	Tradesmen.	Labourers.
	65	47	51
The average number of years' premature loss of life by death above the age of 21 was . . . . .	..	15	11

"The proportionate loss of life, therefore, among the class of tradesmen and labourers, was 57.6 and 42.3, which bears a close relation to the relative mortality per cent. from cholera among the two classes, 66.6 and 30.9."

SECTION III.

On the Habitat or Seat of Cholera.

HAVING in the preceding section traced the progress of the late epidemic, as to the mortality, the influence of age and occupation, it is necessary now to enter upon a question of incomparably more importance, the habitat, namely, or seat of cholera. Notwithstanding the general appreciation of the fact that defective drainage, accumulations of filth, imperfect water-supply, and especially overcrowding and the want of ventilation, conduce to the spread of disease, and especially to the most destructive of all diseases, the zymotic; and notwithstanding, further, the many and strenuous efforts which were made both by the Board of Health and by the public press to expound and enforce this vital truth, it will appear in a subsequent page that all this did not prevent, in the presence of a disease specially liable to the influence in question, a great neglect of sanitary precautions on the part of the local authorities. Nor was a certain amount of scepticism wanting amongst the highest ranks of the medical profession. It was my lot frequently to listen to expressions of such incredulity, not unmingled with something of contempt, when the all-powerful influence of local causes in the propagation of fever, cholera, and other zymotic diseases was asserted. Knowing all this, and having witnessed, on the one hand, the frightful

evils resulting from the general rejection by the parochial authorities of the comprehensive measures laid down by the Board of Health for the public safety, and, on the other, the great and invariable benefits which followed even their partial application, I trust it may be permitted me, in this and some succeeding sections, to elucidate, so far as the metropolis is concerned, this double truth, by setting forth in some detail the large body of evidence acquired during the past year under the auspices of the Board of Health, of which it may be safely affirmed that it exceeds all the information hitherto obtained in Europe in relation to the special causes influencing the progress and spread of cholera.

In viewing the progress of cholera, whether from country to country, from city to city, or even among the inhabitants of any one city, there is, no doubt, much on the surface which appears to indicate that it extends from man to man; this is therefore the conclusion which one would expect the generality of mankind to form, as indeed they have formed, on the subject. It is seen, for example, that great masses of Hindoo pilgrims come together at their annual festivals in some sacred city free from cholera, and that soon afterwards the epidemic breaks forth among them and spreads with destructive energy, sweeping off thousands of victims, and then ceasing so soon as the vast crowd disperses in affright; or, again, in some European kingdom the epidemic decimates the cities, where men abound and intercourse is excessive, and spares the open country, where the population is limited and communication slight; or still further, persons in immediate contact with each other, so to speak, the members of the same families, the inmates of the same house, the wife who watches by the side of her husband's bed, the nurse who waits upon the sick,—these, being exposed to direct communication with an affected person, are sometimes attacked in succession; nay, it has been said that those who have washed the linen of cholera patients have been seized with the fatal malady.* Then, again, it is affirmed, and with much truth, that the disease often follows the great tracts of human intercourse; that it passes, for example, along the banks of navigable rivers, where they form, as in many parts of the Continent, the main channels of communication.

That these and a thousand other instances of a like character which might easily be collected should have led to the inference above stated, is not surprising; but when they are more carefully scrutinized, much, if not the whole, of their weight disappears. It has been found, for example, by experience, that when the Hindoo worshippers quit the pestiferous and foul hovels in which they had been crammed together in their sacred city, though many carry with them the seeds of the affection, and die after their arrival in the pure air of the country, they do not communicate the disease to the villages around; that, although it is true the towns of Europe suffer more than the country, yet, when the circumstances both of the attack and the exemption are cautiously investigated, it becomes evident that neither the one nor the other can be explained on the ground of numbers; for it can be abundantly shown that great masses of people in incessant communication, if living in

* See a note in Appendix, No. 5, on this last point, by Dr. Waller Lewis.

cleanly and well-ventilated dwellings, escape; whilst the scattered inhabitants of villages, and even of isolated houses in the country, may be, and often have been, decimated by cholera, if their sanitary state is unfavourable. The following are selected from a multitude of similar examples, in illustration of the latter position.

East Farleigh Hop-pickers.—In the month of September a most fatal outbreak of cholera occurred in the parish of East Farleigh, near Maidstone, among the hop-pickers engaged on the farm in the occupation of Mr. Ellis, a large grower, and who employs about 1000 persons of all ages, of whom two-thirds are Irish. These people were lodged, for the most part, in various sheds and outbuildings, and some few in cottages, each consisting of a single room. On September 12, 1849, cholera broke out among these people, the first case being that of a man who had arrived the evening before, and who had been suffering from diarrhoea the day previously. The disease rapidly extended, so that in three or four days 70 or 80 persons were ill. The results were as follows:—

Attacks of developed cholera	. . . . .	97
Deaths	. . . . .	46

There was an enormous amount of diarrhoea; Dr. Plomley, of Maidstone, who was called to give his professional aid, having had under his observation 201 cases, and it is known that many more were attended by the other medical men. Having been instructed by the Board of Health to inquire into the causes of this attack, I made a careful examination of the premises, and received a large body of evidence from the medical men who had attended the sick, and from others. As I shall have occasion to present a special Report on this case, it will suffice to state here, as to the source of the mischief, that I entirely coincide in the recorded opinion of Dr. Plomley that—

"the disease which caused so great a loss of life, and consequently so much misery and distress to the survivors, arose entirely from causes which are remediable and removable, namely, impure air arising from overcrowded and ill-ventilated apartments; impure water derived from wells containing the soilage of cow-yards and human filth; and impure food sold at a cheap rate by unprincipled itinerant vendors of putrid fish and adulterated bread."

That this is the true view of the case is corroborated by the fact that, according to Dr. Plomley's belief, not one of the hop-pickers belonging to the neighbourhood, and who slept at their own homes, was attacked with cholera. I have reason to believe that the overcrowding was inordinate: thus in one room, containing about 700 cubic feet, Dr. Plomley found at four in the morning 14 persons, which gives about 50 cubic feet to each, whilst 500 cubic feet for each person is the lowest allowance compatible with the maintenance of health. This gentleman adds, "the effluvium was so powerful that he could not enter the room; in it was a child suffering with cholera, and two other cases occurred in the same room."*

* It is due to Mr. Ellis, who is only a tenant, to state that there are some particular circumstances connected with the property he holds; that, in consequence, improve-

There are some other points connected with this case which are instructive. It appears that on the same farm a severe attack of Asiatic cholera occurred in 1834, when 34 hop-pickers died, although the disease did not elsewhere prevail. At Barning, according to the statement of the Rev. H. W. Wilberforce, vicar of East Farleigh, is a farm, formerly in the holding of the same tenant who occupied the farm now held by Mr. Ellis at Farleigh, and at that time under the same plan of management. In 1845 the farm at Barning was taken by another occupier, one of whose first steps was to provide extensive buildings for the hop-pickers. In 1849 the first case of cholera in the neighbourhood occurred at this improved farm, but no second fatal case took place among 400 persons, owing, as it is believed, to the improvements that had been effected as to space and ventilation, and to prompt treatment of the premonitory diarrhoea. In proof of the direct advantages conferred by sanitary ameliorations, it may be stated that Mr. Lewis, an owner and occupier of land in East Farleigh, and who employs about 150 hop-pickers, and who has provided for them much better lodgings than the average accommodation, has had so little sickness among his people, that since his residence, 21 years, he has never had occasion to call in medical aid, though it is well known that sickness, especially low fever, diarrhoea, and dysentery, prevail generally among the hop-pickers, particularly in wet seasons; last year there was considerable diarrhoea among Mr. Lewis's people; but he, having engaged, prior to the outbreak of cholera, a medical practitioner to visit the people daily, every case of bowel complaint was arrested.

Attack of Cholera in a country village.—In a small country village in Wiltshire a severe attack took place, the disease being definitely limited to four cottages, which were known to be very much crowded, and are thus described by the vicar, in a letter with which he favoured me:—

"The cottages, four in number, and near together, were ill ventilated, badly drained, and with stagnant pools near them, the water of which was used for culinary purposes and generally for drinking: each cottage consisted of one living and one sleeping room, and contained from six to nine persons."

In these four cottages, thus combining several of the worst evils of a populous town, overcrowding, foul drinking-water, and noxious exhalations, no fewer than 16 cases of developed cholera and 7 deaths took place; in three of the cottages every individual was attacked, except the husband in each family: no other cholera attacks occurred in the village, though bowel complaints were general.

Illustrations of the influence of Locality.—The progress of the late epidemic through Europe, when carefully studied, has demonstrated that the principal determining cause of the spread of the disease—I do

ments relating to the accommodation of the hop-pickers have been delayed; and that it is intended these improvements should be made, probably before the next hop-season.

not here speak of the efficient cause of cholera, which is at present altogether unknown—is locality. In thus broadly advancing a position which is, with different modifications, held by the large majority of those who are practically acquainted with cholera, it is not of course intended to deny the powerful influence of other causes—such as constitution, mode of living, occupation, age, and so forth. What is meant to be asserted is, that, whether the general march of the epidemic be considered, or the progress of it in individual cities and in parts of cities, the main influential cause is connected with locality. In investigating this subject, and especially in considering the assertion that the march of the pestilence has followed in the direction of human communication, it is an interesting and important consideration that in several European countries—in Germany, France, and England—the lines of intercourse have been greatly changed in the interval between the first and last epidemics, between 1832 and 1848. Old routes have been abandoned, new ones have been opened; many towns and cities which in 1832 were the centres of travelling and traffic have become comparatively deserted, while others, then insignificant or even not in existence, have grown up into important channels; and, above all, the introduction and multiplication of steam-vessels on the ocean and on rivers, and of railways on the land, have in a multitude of instances totally changed the current of intercommunication. But it is a striking fact, that, in the midst of all these changes and deviations, the cholera has steadily held its course through one path; so bound is it to definite localities, that with some exceptions it has, so far as Europe is concerned, in each epidemic—in 1831-32, in 1837, and again in 1848—visited and avoided precisely the same countries and the same cities; it has re-appeared in the interior of towns on each occasion in its old haunts; it has come back after an interval of years into the same districts and streets; nay, it has, in various instances, even revisited identical houses, and, it is affirmed, the same rooms.* This unmistakable feature of the epidemic is even indicated by its general progress from one quarter of the globe to another, from east to west; for although there are some inconsiderable deviations, the disease observed rigorously the same route, attacking in the same order the same countries and the same cities in 1846-48 as in 1830-32.†

The following table, in which, however, there are several errors as to dates, taken from the treatise of M. Tardieu, places this fact in a striking point of view:—‡

* Dr. Swaagman states that at Groningen, in Holland, the disease in 1832 attacked in the better part of the city only two houses; and that the epidemic broke out in these two identical houses in the visitation of 1848.—(Lancet, vol. i., 1849, p. 109.)

† M. Lasègue, who was sent by the French Government to observe the progress of the disease in Russia, says that it has two modes of propagation: one in obedience to a force which impels it over vast tracts of country in a certain determinate direction; secondly, in obedience to subordinate laws, which cause it to disperse itself over towns situated on its course, and to prevail in them for a greater or less space of time. When thus localized, it seems to lose, as far as that particular city is concerned, its tendency to pass in a particular direction, the laws of its transmission from house to house not being identical with those which impel it from province to province.—(British and Foreign Medico-Chir. Rev., January, 1849.) This is, no doubt, true generally, but many instances have occurred in this country which show that in towns the disease often obeys some special influence as to direction.

‡ See 'Cholera Epidémique,' p. 99: Paris, 1849.

	Epidemic of 1830 to 1832.	Epidemic of 1846 to 1848.
Sallian	June 1830	28 Oct. 1846
Tiflis	13 ,, ,,	2 June 1847
Astakhan	1 Aug. ,,	16 July ,,
Novotcherkask	30 ,, ,,	30 ,, ,,
Kazan	21 Sept. ,,	17 Sept. ,,
Moscow	30 ,, ,,	30 ,, ,,
Kiew	26 ,, ,,	5 Oct. ,,
Mohilev	January 1831	12 Nov. ,,
St. Petersburg*	28 June ,,	8 July 1848
Berlin†	31 Aug. ,,	20 Aug. ,,
Vienna	14 Sept. ,,	No attack.
Hamburg	,, ,,	1 Sept. 1848
Sunderland	4 Nov. ,,	5 Oct. ,,
London‡	8 Feb. 1832	24 ,, ,,
Coasts of France.	15 Mar. ,,	November ,,

German Experience.—During a visit which I made to Germany in 1848, at the instance of the General Board, for the purpose of observing the cholera, several striking illustrations of what may be called this law of the disease, as to its march, came to my knowledge, some of which I beg to embody in the present Report.

The kingdom of Hanover, lying in the north of Germany—which, as at Berlin, Hamburg, and a multitude of other places, has suffered severely in 1831, 1834, 1847, and 1848—has, with one marked exception, escaped in all these epidemics. This single exception out of a whole kingdom was afforded by the town of Luneburg, which has suffered in each epidemic, and so severely in 1848, that, out of a population of 12,000 inhabitants, 500 cases of cholera and 250 deaths occurred in 20 days. In another direction, the kingdom of Saxony has been exempt; so again, the town of Frankfort-on-the-Maine, though forming the centre of a district in the towns of which cholera had in former epidemics prevailed, had, up to November, 1848, enjoyed an entire immunity.

Now, it cannot be said that there is anything as regards the mode of communication which can explain these marked phenomena; no attempt was made to stop the incessant intercourse between Hamburg, which has suffered in each epidemic, and the kingdom of Hanover; nor still less was the exemption of Frankfort owing to any restriction of communication.

Experience in the Metropolis.—The general progress of the epidemic, as to locality, in the metropolis, has amply illustrated the influence of noxious localities; since, with some few exceptions, where other obvious causes were in operation, the neglected, filthy, and overcrowded parts have been the special seat of the disease. In order to present a general

* This is erroneous: the epidemic began in the beginning of June, and on June 12 Dr. Müller reports 100 attacks and 33 deaths.

† The epidemic in Berlin, according to the official information given me, commenced on 27th of July; some isolated cases, as so often happens, occurred previously, namely in June.

‡ The first case occurred on September 22nd.

view of the habitat of Cholera, the two following tables have been prepared: the first shows the relative mortality of the epidemics of 1832-33 and of 1848-49 in the Superintendent-Registrar's districts; in the second table these districts are arranged according to the severity of the attack: and still further to indicate the locality with reference to an important point, they are distinguished according to their relation to the Thames:—

TABLE showing the Population of the Superintendent-Registrar's Districts in 1831 and 1849; and the Mortality from Cholera and Diarrhœa during both Epidemics, with the proportionate rate of Mortality to 1000 living.*

Superintendent-Registrar's District.	Population 1831.	Estimated Population 1849.	Deaths 1832-3.	Deaths 1849.	Proportion to 1000 living 1832.	Proportion to 1000 living 1849.
Bermondsey	29,741	39,672	210	883	7	22
Bethnal Green	62,018	85,109	345	976	5	11
Camberwell	28,231	52,246	107	594	3	11
Chelsea	32,371	48,392	272	312	8	6
City of London	123,608	124,505	605	896	5	7
Clerkenwell	47,634	65,725	65	157	1	2
George, St., in-the-East	38,505	43,142	123	268	3	6
Giles, St.	52,907	51,199	280	313	5	6
George, St., Hanover-square	58,209	74,533	74	161	1	2
Greenwich	63,564	93,964	149	894	2	10
Hackney	34,527	50,214	8	229	2	5
Hampstead	8,588	11,457	..	12	..	1
Holborn	42,696	44,356	46	194	1	4
Islington	37,316	76,929	39	242	1	3
Kensington	52,981	98,320	52	365	1	3
Lambeth	87,856	143,557	337	1824	4	13
Lewisham	18,426	26,796	..	128	..	5
Luke, St.	46,642	51,874	118	232	3	4
Martin, St., in-the-Fields	23,970	25,049	..	162	..	4
Marylebone	122,206	151,706	355	333	3	2
Newington	44,526	64,137	200	1003	4	16
Pancras, St.	103,548	154,152	230	447	2	3
Poplar	25,066	36,729	101	402	4	11
Rotherhithe	12,875	13,894	19	406	1	29
Shoreditch	68,564	96,272	57	899	1	9
Southwark	91,501	104,747	1128	1928	12	18
Stepney	72,442	107,408	358	601	8	6
Strand	42,015	43,524	26	184	..06	4
Wandsworth	33,090	46,054	46	540	1	11
Westminster	85,220	77,299	450	666	5	9
Whitechapel	64,141	100,215	736	564	11	6

* This table, as regards 1832-33, has been constructed upon the only available documents; but it can, for that epidemic, be viewed as an approximation, since the returns relating to a period prior to the Act for the Registration of Births, Deaths, and Marriages, were doubtless in many instances defective. Thus in this table the mortality in "Clerkenwell" appears to have been higher in 1849 than in 1832; whereas Mr. Liddle states that this parish has suffered much less from the present visitation; and also mentions that in 1832-33 no fewer than 69 deaths occurred in the workhouse alone, while the total number for the whole district reported only amounts to 65. The mortality for 1848-49 is taken from the Returns of the Registrar-General.

TABLE showing the Superintendent-Registrar's Districts, arranged in the order in which the Mortality from Cholera and Diarrhœa, proportionately to every 1000 living, was highest in the two Epidemics of 1832-33 and 1848-49.

Order.	Epidemic of 1832-33.	Proportion to 1000 living.	Order.	Epidemic of 1848-49.	Proportion to 1000 living.
1	<i>Southwark, S.</i>	12	1	<i>Rotherhithe, S.</i>	29
2	<i>Whitechapel, N.</i>	11	2	<i>Bermondsey, S.</i>	22
3	<i>Chelsea, N.</i>	8	3	<i>Southwark, S.</i>	18
4	<i>Stepney, N.</i>	8	4	<i>Newington, S.</i>	16
5	<i>Bermondsey, S.</i>	7	5	<i>Lambeth, S.</i>	13
6	<i>Bethnal Green, N.</i>	5	6	<i>Bethnal Green, N.</i>	11
7	<i>City of London, N.</i>	5	7	<i>Camberwell, S.</i>	11
8	<i>St. Giles, N.</i>	5	8	<i>Poplar, N.</i>	11
9	<i>Westminster, N.</i>	5	9	<i>Wandsworth, S.</i>	11
10	<i>Lambeth, S.</i>	4	10	<i>Greenwich, S.</i>	10
11	<i>Newington, S.</i>	4	11	<i>Shoreditch, N.</i>	9
12	<i>Poplar, N.</i>	4	12	<i>Westminster, N.</i>	9
13	<i>Camberwell, S.</i>	3	13	<i>City of London, N.</i>	7
14	<i>St. George-in-the-East, N.</i>	3	14	<i>Chelsea, N.</i>	6
15	<i>St. Luke, N.</i>	3	15	<i>St. George-in-the-East, N.</i>	6
16	<i>Marylebone, N.</i>	3	16	<i>St. Giles, N.</i>	6
17	<i>Greenwich, S.</i>	2	17	<i>Stepney, N.</i>	6
18	<i>St. Pancras, N.</i>	2	18	<i>Whitechapel, N.</i>	6
19	<i>Clerkenwell, N.</i>	1	19	<i>Hackney, N.</i>	5
20	<i>St. George, Hanover-square, N.</i>	1	20	<i>Lewisham, S.</i>	5
21	<i>Holborn, N.</i>	1	21	<i>Holborn, N.</i>	4
22	<i>Islington, N.</i>	1	22	<i>St. Luke, N.</i>	4
23	<i>Kensington, N.</i>	1	23	<i>St. Martin-in-the-Fields, N.</i>	4
24	<i>Rotherhithe, S.</i>	1	24	<i>Strand, N.</i>	4
25	<i>Shoreditch, N.</i>	1	25	<i>Islington, N.</i>	3
26	<i>Wandsworth, S.</i>	1	26	<i>Kensington, N.</i>	3
27	<i>Strand, N.</i>	0.06	27	<i>St. Pancras, N.</i>	3
28	<i>St. Martin-in-the-Fields, N.</i>	0.02	28	<i>Clerkenwell, N.</i>	2
29	<i>Hackney, N.</i>	0.02	29	<i>St. George, Hanover-square, N.</i>	2
30	<i>Lewisham, S.</i>	0	30	<i>Marylebone, N.</i>	2
31	<i>Hampstead, N.</i>	0	31	<i>Hampstead, N.</i>	0.09

NOTE.—The districts bordering on the Thames are marked by Italics. The districts are distinguished by the letters S. and N. as they are on the South or North sides of the river.

In the Appendix to this Report will be found a more important document, since it illustrates the weekly progress of the epidemic in the "sub-districts," during the 60 weeks from October 7, 1848, to November 24, 1849, inclusive, which, for all practical purposes, may be considered as including the whole period of attack, as only three deaths occurred subsequently, the last being registered in the week ending December 22, 1849. To render this table more generally useful, columns have been added to the returns of the Registrar-General, on which it is founded, showing the total deaths in each "sub-district," and the proportion of deaths to every 10,000 inhabitants. (See Appendix, No. 1.)

Tinted Cholera-Maps.—For the construction of an accurate Cholera-Map of the Metropolis it would have been requisite to have obtained

the amount of disease in each street; but the expense, delay, and difficulties which this would have involved, prevented the realization of an object in itself most important. Under these circumstances a map has been prepared, which rests essentially on the return above referred to, showing the mortality in each sub-registration district. In the tinting, the depth of which shows the amount of mortality, the assistance of the Medical Inspectors has been given; several of the medical officers have likewise kindly given much valuable aid in regard to the affected localities: among these gentlemen I may particularly mention Mr. Martin, Bermondsey; Mr. Marshall, Walworth; Mr. Hooper, Southwark; Mr. Tebay and Mr. Pearce, Westminster. Several spots are marked, indicating local and circumscribed attacks of great severity. Lines have also been drawn on the cholera map, and sections corresponding to them are represented on a separate map, for the purpose of showing the elevation of the different parts of the metropolis above the level of high-water mark, together with the relative mortality, which is indicated by tinting. It is hoped that these maps will convey to the eye a tolerably accurate idea of the places on which the ravages of cholera principally fell, and, taken in combination with the various tables, will suffice to show the progress of the epidemic, so far as locality is concerned. Of the parishes of Bethnal-green and Shoreditch more exact maps have been prepared, under the direction of Dr. Gavin, resting on his own investigations, by which every death from cholera has been traced not only to the particular street in which it occurred, but even to the individual house.

Review of the Localities affected.—Two striking facts present themselves in reviewing these tables: first, that the localities south of the Thames have been the main seat of the epidemic; second, that the districts bordering both sides of the river have collectively suffered much more than those removed from the stream. Thus, out of the 10 parishes and unions in which the percentage of deaths is highest, eight are placed on the south of the river; whilst in all the southern districts, with a population of 585,067, or 26.5 per cent. of the whole population of the metropolis, no less than 8200 deaths, or 48.8 per cent. of the whole mortality, occurred: as regards the districts skirting the two sides of the river, their population amounts to 947,936, or 42.9 per cent. of the whole; the deaths being here 9966, or 59.3 per cent. of the total mortality.

The tables of Mr. Edwards show, in detail, the influence of locality on persons of various ages, and in the three principal ranks of life; and the following extract from the remarks of that gentleman will suffice to illustrate the subject:—

“These tables (see Appendix, Nos. 2 and 3) are important as indicating that, where there are defective sanitary arrangements, there will be found an excessive mortality. It shows that in wealthy districts, where attention is paid to proper sewerage, where cleanliness is observed, there, comparatively speaking, cholera has been harmless; and that where there is an almost total want of these appliances to health the epidemic has been most destructive.

“If merely two districts of the metropolis are compared, viz. the north and south, the difference is most striking. The population at each age has been

taken as given in the census of 1841, for both districts, and the relative proportion of mortality to the living at each quinquennial period shown, and, in every instance, a fearful difference is indicated on the side of filth, overcrowding, and defective drainage. In the north district the mortality at all ages was only .26 per cent. to the living, whilst in the south it was 1.47 per cent. or nearly 6 times greater; but if the mortality at each age is taken together with the population, the difference is still more apparent. Thus, in the following table it is made clear that at every period of age there is a considerable excess, which is more marked as the ages progress: thus from 60 years of age and upwards in the north district, only 1 per cent. of the population died; whilst in the south 3.9 per cent. perished, showing a difference against the south district of 2.9 per cent. or 29 in 1000 living; thus demonstrating that the south district contains in itself an immense amount of exciting causes of disease.

DISTRICT.	Under 5.	5 and under 10.	10 and under 15.	15 and under 20.	20 and under 25.	25 and under 30.	30 and under 35.	35 and under 40.	40 and under 45.	45 and under 50.	50 and under 55.
South	1.8	.4	1.3	.7	.6	1.0	1.2	1.8	1.1	2.3	2.2
North . . . . .	.3	.1	.2	.1	.1	.2	.2	.2	.3	.5	.5
Mortality excess of South over North. }	.6	.3	.6	.6	.5	.8	1.	1.6	.8	1.8	1.7

DISTRICT.	55 and under 60.	60 and under 65.	65 and under 70.	70 and under 75.	75 and under 80.	80 and under 85.	85 and under 90.	90 and under 95.	95 and under 100.	100 and upwards.	All Ages.
South	3.5	2.7	4.4	4.1	5.6	6.9	11.4	5.9	..	..	21.47
North . . . . .	.6	.8	1.1	1.1	1.3	1.3	2.8	2.5	..	..	.26
Mortality excess of South over North. }	2.9	1.9	3.3	3.	4.3	5.6	8.6	3.4	..	..	1.21

“It should also be borne in mind that the south district embraces many localities which are proverbially healthy, such as Dulwich, Norwood, Brixton; and the great excess therefore arises in those districts where there is defective sewerage, overcrowding, &c.: such as part of the parish of Lambeth, the parishes of Bermondsey, Rotherhithe; St. Olave, St. Saviour, St. George, Southwark; and Newington.

“The excess of deaths, therefore, in these particular parishes, must be considerably greater than has been stated above.”

River Localities.—By referring to the tinted map of London, which shows the more precise seat of the mortality in each district, the intimate relation existing between the activity of the disease and proximity of the river will become still more apparent; the dark colour, which indicates the relative mortality, showing, even at a distance, the general course of the Thames. A similar effect was produced by the river Lea, as it runs through Hackney union: thus, in a cluster of cottages at High-hill Ferry, where, however, other causes of insalubrity also operate, Dr. Gavin states six deaths took place, besides which 84 cases of choleraic diarrhoea were discovered during the house-to-house visitation.

This relation between cholera and rivers running through large towns has been very generally remarked; and extended observation seems to show that one main cause of it is the large evaporating surface of foul water which is thus formed. It is almost needless to point out that, when the numerous sewers of a city reach the stream, one part of their contents, widely mingling with a large body of water, undergoes solution, and thus presents a physical condition favourable to its subsequent escape into the atmosphere in the form of mephitic gases; whilst other portions, owing to the diminished velocity, sink to the bottom near the edge of the river, and thus become deposited on the banks of putrid mud, which will, at the next tide, being laid bare to the action of the sun and air, exhale poisonous effluvia. Some facts have come to my knowledge which tend to support this, the common view, by showing that it is precisely in those spots of the stream which receive the principal body of sewage that cholera specially ravages the adjoining population. In the important work of Dr. Rotherhith on the cholera of 1832, as it occurred at Hamburg,* and which contains by far the most comprehensive statistical account of the disease that has ever been published, it is shown that in those streets which immediately face the spot where the numerous canals that have traversed the city, and have become loaded with the excreta of 175,000 people, concentrate to pour their foul contents into the Elbe, the cholera raged so violently as to destroy 3·01 per cent. of the inhabitants; whilst the other and purer parts of the river suffered much less. It is remarkable that the street at Berlin already referred to as having suffered severely, occupies on the map of that city precisely the same spot as the above locality at Hamburg, being, in fact, placed just where the numerous branches of the Spree, which go off from the river at its entrance into the city, again re-enter it, like a huge Fleet-ditch, after being loaded, as was pointed out to me, with all the filth from the drains and débris of the houses. In the small town of Chesham, where a severe outbreak of cholera took place in 1848, I found that the focus of the disease was a place called Water-side, situated below the town and close to the little river Chess, which, entering the place as a sparkling stream, becomes subsequently poisoned by the putrid matters from tanners' yards, slaughter-houses, and cesspools.

As it appears from these, and other similar facts, that—whatever may be the other circumstances affecting the inhabitants of river localities; whatever may be their mode of life, the quality of the water they consume, or the nature of their occupation—those who reside on the borders of rivers, whether in cities or small towns, in England or in other countries, become the special victims of cholera, it is difficult to arrive at any other conclusion than that streams polluted by the refuse of large masses of people so deteriorate the air as to operate in the time of a destructive epidemic, when all depressing agents have increased force, injuriously on the human frame, and thereby predispose it to the attacks of disease.

Influence of Elevation.—Another cause operating injuriously on river localities is doubtless their low and damp situation; a condition which particularly applies to the parts of London lying to the south of

* 'Die Cholera-Epidemie des Jahres 1832, in Hamburg.'

the Thames, which are built in fact upon what was originally a marsh, and the drainage of which is still most defective. Considerable attention has, especially in late years, been directed to the influence of altitude on epidemic diseases; and this unquestionably operates most powerfully, particularly where the elevation is very great, as in mountain ranges.

The work of M. Boudin, "Essai de Géographie Médicale," contains much interesting matter on the point in question. Another observer, Dr. Fourcault, speaking of the influence of geological and hydrological conditions on the progress of the cholera in France, remarks that

"the cities and villages disposed in an amphitheatre, and where the population is submitted to the same regimen and to the same social conditions, have, in general, presented three distinct zones: the inferior, the most humid, has been the principal focus; in the middle, the epidemic loses a part of its activity; in the superior zone, it is almost or entirely extinguished, according to the elevation, the direction of the mountain, the nature of the soil, and the mineralogical composition of the deep strata."

M. Fourcault further observes that the mouths of rivers have been the principal theatre of the ravages of cholera, whilst it has scarcely ever shown itself at their source; that the disease appears to have been stopped in the regions where the streams run on primitive rocks, where little alluvium is found; and that villages placed in the midst of loops formed by rivers have specially suffered.* It is remarkable that the parish of Rotherhithe, which is situated in such a loop of the Thames, suffered in the last epidemic more severely than any other in the metropolis; but this was far from being the case in 1832. An interesting diagram published by the Registrar-General shows the average elevation of the several districts, together with the relative mortality during the 52 weeks ending September 29, 1849. The general result is that the deaths have diminished in proportion to altitude; so that, whilst at the elevated village of Hampstead the mortality is only 8 in 10,000, in Southwark, Bermondsey, and Rotherhithe, which are below high-water mark, the deaths are, respectively, 164, 189, and 263 in 10,000. (See Map in Appendix.) The rule, however, is by no means rigorously observed, there being several exceptions, which, it is thought by Mr. B. Smith, who has given an interesting paper on the subject, may be explained by other local causes.† The whole question is one of importance, especially as concerns the site for public institutions, in some of which, owing to a bad selection, a large sacrifice of life has occurred.

Special Localities attacked.—In examining the mortality tables, and comparing the several districts one with another, it may excite some surprise to find that localities which combine more noxious influences than others have yet escaped with fewer losses; thus Whitechapel, St. Giles, and St. George-in-the-East, have suffered less than Camberwell and Wandsworth. It will also be remarked that several of the districts have changed places in the lists of 1832-33 and 1848-49, the most remarkable example of which is furnished by Rotherhithe, a parish very low down in the scale of death in the former period, whilst it

* Gazette Médicale, 1849, page 338.

† See Mr. Smith's paper in the Medical Times, November, 1849.

stands first in the late epidemic. These and many other seeming contradictions have always attended the march of cholera; but although they cannot in the existing state of knowledge always be satisfactorily explained or understood, they should be regarded like the so-called exceptions in physical and physiological science, and should in no degree be permitted to mislead the observer, as to the essential circumstances which determine the active seat of the disease. A country or a city may escape, although it contains spots suitable to the development of the epidemic if the germs of it are sown, and another country or town, perhaps even more healthy, may suffer; but yet it is found that, whenever and wherever the efficient cause of cholera is present, it selects as the special sphere of action but one class of localities; whether the attack concerns the heart of London, a country village, or even a single group of houses, the general condition of these places will be the same.

Cholera attacks in Groups.—One of the most constant laws connected with the progress of cholera, and which is as evidently dependent on locality as it is inexplicable on the score of human intercourse, is that, when the epidemic makes its appearance in a city, town, or even village, it attacks in groups; that is, the disease seizes on a certain number of courts, alleys, or streets, or on a certain cluster of houses; decimates their inhabitants; then ceases, and breaks out in a similar manner elsewhere, occasionally returning again to the first locality. All who have seen the disease are familiar with this feature, which exactly corresponds with what is observed in typhus, which often attacks certain houses in towns, and cottages in the country; single farm-houses have often been thus selected. In such instances as these—and many very striking ones occurred in London during the late epidemic—the pestilence is often as definitely bounded by locality as if surrounded by an impassable line; and, which is important, when it assaults a fresh locality, it does not do so by continuity, passing from one court into the next adjoining, but it leaps suddenly, so to speak, to some distant place. The same remark applies to different countries, so that we have seen that at one bound it has passed from London to Paris, missing the intervening places. There is so much certainty as to this mode of attack, that those who are engaged in the management of the epidemic, and especially in house-to-house visitation, must look for it, and make their arrangements accordingly. It will not escape observation, that, although this peculiarity makes alertness thus essential, it at the same time greatly facilitates the application of preventive measures, as a staff of medical visitors could be readily transferred, as the occasion arose, from district to district, a procedure which was often adopted by the medical inspectors.

Another and well-known peculiarity, which evidently is not connected with persons, is that cholera often attacks in certain definite directions, herein again conforming to another member of the zymotic class, the plague. Thus localities facing in a particular direction have in India and Europe suffered, whilst others, immediately contiguous, have escaped; one side of a street, for example, may so suffer, and the opposite side be exempt. A remarkable instance of this occurred in Rotherhithe, where many of the houses on one side of a street occupied by respectable private families were attacked, whilst

only one house on the other side suffered. The medical officer of this parish (where the epidemic was more developed than in any other part of London), Mr. Chandler, also remarked that in several instances the disease attacked in a definite line or direction, passing right through or across several streets "like a cannon-ball." I have been informed of other instances like these; at Bedford, for example, two streets were named as having each suffered on one side severely, the other side almost or entirely escaping. The same fact is noticed by Dr. Crawford in respect to St. Petersburg.

In proceeding to inquire what is the condition of all those places in which the force of the epidemic is specially developed, a clue will be found in the fact, so distinctly established by the researches of the Metropolitan Sanitary Commission, that the habitat of fever and the habitat of cholera are one and the same. So clearly did this great truth appear, that, prior to the return of the dreaded epidemic to our shores, the Commissioners did not hesitate to affirm that the typhus track would, on the re-appearance of cholera, become the cholera track, a prediction which, amidst all the seeming capriciousness of the disease, has been but too fatally realized in the late visitation. It is, doubtless, a painful thing to make out, with the demonstrative evidence of statistical returns, all the elementary parts which go to form this common track of sickness, suffering, and death; and yet, as the great desideratum in sanitary as in all other investigations is the attainment of certainty, it is a point of infinite promise for the future to demonstrate that, whatever may be the aspect of the epidemic which is traced to its home, typhus, scarlatina, smallpox, or cholera, we find but one class of causes, or, to typify the whole in a single word, but one cause, and that filth, standing in the relation of the prolific parent of all this diversified offspring, as it presents itself in the courts and alleys of London. It is not a question of food, for people worse fed than thousands who have become the victims of these diseases, provided they breathe day and night the fresh and bracing atmosphere of the country, escape; whilst instances are not wanting of persons amply provided with every physical comfort, lacking only pure air, falling under epidemic attacks.

A remarkable example of the latter kind was afforded by an institution in which young women were received for the purpose of reformation, and where so destructive an outbreak of cholera occurred, that out of 96 inmates 40 were seized with cholera, of whom no fewer than 15, or 15 per cent., died. On inquiry into the causes of this violent attack, it appeared that there was nothing in the state of the neighbourhood, although this was in many points most defective, which could alone account for it. Nor could the general mode of living be assumed as the cause, since the diet was ample, good meat being provided six days out of the seven: in short, after a careful investigation, the only reasonable cause that could be assigned was an impure atmosphere caused by the want of ventilation in the dormitories, in several of which the windows had been partly closed up, and which were, moreover, much crowded.

It is then in filth, that is, in decomposing organic matter, that the main predisposing causes of epidemic diseases are to be sought out—filthy alleys, filthy houses, filthy air, filthy water, and filthy persons. This being so, and as in the spread of zymotic affections the agency of

the predisposing is even more important than the mere presence of the efficient causes, it is evident that sanitary science, when all its capabilities and applications shall have been developed, and the sources of filth of every description shall have been obviated, will reduce within comparatively narrow limits a class of disease which so often sets at defiance the powers of medicine, so long as these are only aimed at a curative result. The reports of the medical inspectors abound in facts, derived from every part of the metropolis, confirmatory of the positions here assumed; but as the condition of Bethnal-green has been made the subject of a most careful and elaborate investigation by Dr. Gavin, this parish, though not specially distinguished as to its sanitary state from many others, will be selected for the sake of general illustration; and in order to bring before the eye the particular localities attacked, a tinted map, carefully prepared by the gentleman just named, accompanies the present Report.

BETHNAL-GREEN.—In his important work on the sanitary condition of the labouring population, Mr. Chadwick has given a map of this parish, tinted and marked so as to show the mortality from epidemic diseases and diseases affected by localities, for 1838. If this be compared with Dr. Gavin's cholera map, it will be seen that there is a remarkable correspondence between them, the western parts of the parish having in both cases especially suffered.

There are in Bethnal-green four registration districts, called "the Green," "Church," "Town," and "Hackney-road." The state of health in these districts may be judged of by the following table, constructed from Dr. Gavin's Report, showing the deaths to the population from all causes, from zymotic diseases, and from cholera:—

	All Causes.	Zymotic.	Cholera.
Town	1 in 43	1 in 137	1 in 89·4
Hackney-road	1 in 50	1 in 196	1 in 69·7
Green	1 in 57	1 in 132	1 in 99·0
Church	1 in 50	1 in 260	1 in 165·0

The actual mortality from cholera and diarrhoea, in the four districts, was as follows:—

	Cholera in 1848.	Cholera in 1849.	Diarrhoea in 1849.	Total.
Town	8	216	33	257
Hackney-road	13	288	29	330
Green	1	151	42	194
Church	5	97	18	120
Total	27	752	122	901

It thus appears that in the late epidemic the districts have suffered in this order:—

1. Hackney-road	1 death in 69·7 of the living.
2. Town	1 " 89·4 "
3. Green	1 " 99 " "
4. Church	1 " 165 " "

If particular spots and individual houses be selected, the mortality arising from the causes presently to be considered—all of which, it must never be forgotten, are susceptible of removal, or of great amelioration—is sometimes found to be enormous. Thus in a district behind Shoreditch Church, but in Bethnal-green parish, and forming parts of the Town and Hackney-road districts, in 16 days, from August 16th to the 31st, there were 211 deaths from cholera and 18 from diarrhoea: "a space of about 400 yards by 150 would include a great part of the district which furnished this excessive mortality."

In some of the streets in this afflicted locality the amount of disease was appalling. Thus, in Old Nichol-street, in 23 houses 33 deaths occurred, three persons dying in one house, and four in another; besides which there were 17 cases of cholera that recovered, 9 cases approaching cholera treated by the parochial medical officer, and no less than 197 cases of diarrhoea discovered by the visitors. In New Nichol-street closely adjoining, 21 deaths, 30 cholera cases not fatal, and 13 approaching cholera, whilst the visitors discovered 135 cases of diarrhoea and 2 of approaching cholera. In Half Nichol-street 24 fatal cases occurred, 20 cases not fatal, and 3 of approaching cholera; and the visitors discovered 152 cases of diarrhoea and 4 of approaching cholera. In one house, No. 1, Collingwood-street, within five days no fewer than six deaths took place, owing, as Dr. Gavin states, to overcrowding.

The virulence of the disease in the two districts above-named may be estimated by the fact, that in six streets no less than 147 deaths occurred in 99 houses, being in the ratio of $1\frac{1}{2}$ to each house.

It is impossible to give in any detail an account of the sanitary state of the localities where such destructive ravages have been committed; a few extracts only are permissible. In alluding to the influenza which prevailed in 1847, Dr. Gavin mentions a most elucidative fact; he says, while there was little increase in the usual mortality in the healthy and clean streets, the mortality was quintupled in the unhealthy and dirty streets. Among the principal of these causes of filth he places the accumulation of solid refuse.

Nor can this be a matter of surprise when it is stated that the solid refuse is never completely removed from the premises, so that in process of time the back yards in several localities have by this accumulation been so raised as to be nearly on a level with what might be termed the first floors of the houses.

House-drainage is nearly entirely wanting, so that the poor inhabitants are compelled to throw their fluid refuse into the gardens, yards, or streets. As showing the utter neglect of this important point, it may be stated that a few years ago 1000 yards of sewer were made from Pollard's-row to Shoreditch Church, and yet not a dozen houses formed a connexion with it.

"Privies.—One open privy for numerous families, and for 20, 30, or 50 persons, is surely most objectionable, but it is quite a common occurrence. In many instances the soil has infiltrated the walls, and percolated through into the houses; and in some cases the floors have been saturated, and have thus been rotted and rendered very quagmires of filth."

The landlords of the poorer tenements very rarely remove the contents of the cesspools, and neglect to do so till compelled by the devastation which the exhalations produce in the form of fever, and alarmed lest their property should get a bad name. The poor, left to rot in their filth, sometimes attempt to rid themselves of this nuisance, and fancy they effect it by burying the soil in their yards.

Water-supply.—In some instances the supply is from wells placed in these yards, so that the water necessarily becomes tainted. In an immense number of instances no water is laid on, the only supply being a stand-pipe, and sometimes only one of these for 20 or even 30 houses. The supply is, as usual, thrice weekly, for two hours at a time. To many houses there is no supply whatever, and the inhabitants beg it, or procure it as they best can.

Graveyards.—This parish seems to suffer, in a special degree, from the evils of intramural interments. Thus it is a practice to deposit corpses in the vaults below the rooms of the National and Infant Schools attached to St. Matthew's Church; in four vaults thus strangely placed, and which are used as public catacombs, Dr. Gavin counted 96 coffins, piled one on another like bales of goods. There is a large aperture for the emission of air from these vaults, which is close under the back entrance of the school. Two years ago, on examining this place, Dr. Gavin was overcome with nausea, caused by the stench either from the catacombs or from a most foul privy adjoining. In the churchyard of St. Matthew's common graves were dug for the victims of the late epidemic, and were affirmed to have been the cause of sickness in the immediate vicinity. It is certain that the children suffered most seriously, no less than 275 boys and 135 girls having been nearly universally affected with illness.

Nuisances.—There are several serious nuisances, especially night-men's yards, slaughter-houses, &c., which greatly deteriorate the air, and operate deleteriously in the propagation of cholera.

Bad Construction of Houses.—All these evils are much aggravated in consequence of the houses having been generally built without any regard to levels; so that, when the streets and footpaths are properly made and levelled, the houses are frequently sunk below the surface, and thus become excessively damp, the ground-floor often resembling under-ground cellars; and yet these are the houses which generally are altogether unprovided with drains.

Of the Hackney-road district, standing first in the cholera list, Dr. Gavin reports, in a valuable statistical work, published, it should be stated, *before* the arrival of cholera—

“This district exceeds all the others in filth, disease, mortality, poverty, and wretchedness; it abounds with the most foul courts, and is characterized by the prevalence of the greatest nuisances and perennial foulness. For many years this district has been notorious as the hotbed of epidemics. This is easily explained when the foulness of the streets, and the nearly total absence of drainage and house-cleansing, are considered; the drainage is, in fact, characteristic of barbarism. Some of the houses are built over the drains, which are very near the surface; the streets are perpetually covered with the most offensive mud; the population is very dense, as many as 30 persons in a single house.” “Each room contains a family, with a bed common to all; generally it is a work-room as well as a dwelling-room.” “Ventilation in these rooms is in the most defective state; the

atmosphere is most oppressive, and loaded with unhealthy emanations; it is a common practice to retain the fecal remains in the rooms, to avoid exposure and the perfect nastiness of the common privies.” “All the tenements in Greengate-gardens are unfit for human habitation.”

The general result of Dr. Gavin's experience of these evils is thus expressed:—

“There is scarcely an exception to the almost absolute rule, that where filth prevails there cholera locates itself. The more closely I have examined the localities in which cholera prevails, the more profound is my conviction of the truth, that, with the exception of a very limited number of other predisposing causes, such as emotions of the mind and constitutional debility, predisposition from previous disease, or impropriety or abuse of diet, local causes alone determine who shall escape and who shall perish from cholera.”

CHURCH AND GREEN DISTRICTS.—Although these two districts of the parish are shown, on the whole, to be more healthy than those already noticed, they abound, in parts of their extent, in narrow alleys, often forming cul-de-sacs without drainage, and strewn on the surface with refuse and garbage. One cause of disease, of a peculiar character, has operated most unfavourably on the inhabitants. Owing to the pressure of that most evil circumstance—deficient house accommodation—a process of transformation has been going on during the last twenty years or more, by which, what were in happier times the summer-houses of the numerous gardens of the industrious tradesmen and weavers, have been converted into habitations. These wooden sheds, placed on the bare ground, are approached by narrow lanes, which are unpaved, nearly all in a muddy and filthy state, especially in wet weather.

“These dwellings,” says Dr. Gavin, “in some instances are unfit to house cattle in; in other, but very few instances (I think I could count the exceptions), they are tolerably clean. They are totally without drainage of any kind, except into shallow cesspools; they are, consequently, extremely damp, and the inhabitants suffer much from rheumatism, from fever, from diseases of the respiratory and digestive organs, &c. There is very seldom any water laid on to the houses; one stand-tap generally supplies 5, 10, or 16 houses: many houses are altogether without water.”

“*Bechford-row* is a narrow confined row of 16 houses, or rather hovels; the 8 southern houses are back to back; they are 2-roomed, with families in each room. The place is abominably filthy; a foul central choked-up gutter, overflowing and exposed privies, and decaying refuse, characterise the place. In 1847, in 14 weeks, 13 cases of fever and 1 of erysipelas occurred. The supply of water is from a small barrel, 21 inches in diameter and 12 deep, which is filled thrice a week. The escape of this place from cholera at the time when it first appeared was considered a remarkable exception to the law which governs its habitat; but the surprise did not last long; in a few days 8 persons perished of cholera and 2 of diarrhoea in these houses. In fact, the death of a certain number of the inhabitants of this row from cholera was as sure as if the warrant of execution had gone forth against them.”

These facts plainly indicate that, whatever difference there may be in the mortality of these districts, it is not attributable, with a few limited exceptions where sewerage and macadamized roads have been introduced, to any sanitary precautions, but rather to the accidental circumstance of there still being much open ground, and consequently a freer supply of air.

Instances of other parts of the Metropolis.—Having given this connected sketch of the sanitary condition of one populous district, it will be proper to select from the large body of evidence contained in the Reports of the Medical Inspectors, and from other sources of information, specimens of the kind of localities in which the epidemic more especially prevailed in other parts of the metropolis.

WHITECHAPEL.—Dr. *Allison*, one of the surgeons of Whitechapel Union, in a letter addressed to Mr. Liddle, Medical Inspector, gives the following painful description of Christopher-court, Rosemary-lane:—

“The court is a cul-de-sac; the entrance is narrow, and covered over by the houses in Rosemary-lane; at the upper end is a large dust-hole, full of filth of every description. Out of the inhabitants, 60 in number, 13, or 21 per cent., were attacked with cholera. There were, on the first floor of one house, eight cases of cholera, of which three were fatal; the door at the foot of the stairs was shut, and on opening it I was repeatedly driven back by the horrid odour and stench from a privy down stairs. This was one of the dirtiest places which human beings ever visited; the stench, the horrible stench which polluted the place, seemed to be closed in hermetically among the people; not a breath of fresh air reached them, all was abominable. After getting up stairs my head reeled in the sickening atmosphere; and on reaching the top, and surrounded by the dead and dying, I was compelled to rush to the window and open it. I threw off the contents of my stomach, and supported myself on the miserable, rotten straw bed. To my Report on such agonizing and pestilential scenes was owing the immediate cleansing of this Augean stable; several of the cases were removed to the cholera hospital, and the disease has not reappeared. In the same court, on the opposite side, were several cases of cholera. In one house, on the ground floor, were three cases; the smell from the privy down stairs was fearful, and it required some courage to go down and search for the plague-spot. I found the privy overflowing directly below the beds of the sick persons, and the cellar containing an immense quantity of excrement, bones, urine, and straw. The worst sewer in London could not have been more dangerous to life. A fatal case occurred next door.”

In another of these deadly courts, Peter's-court, noted for a grating which sends its pestilential vapours into the place, Dr. *Allison* attended a rapidly fatal case; and in the cellar beneath found a privy overflowing, and the ground soaked with fluid excrement:—

“Other cases occurred on the next stair. The nuisances were removed, and I have not been called to any fresh case of sickness in that spot. In short, I have found the connexion between filth and cholera inseparable; they co-exist. I do not say that filth originates cholera; but where it is, there cholera flourishes and extends. It seems to be a soil well adapted for the rapid growth and development of all its horrors; the bud soon becomes a large blossom, and the fruit is death. I find that wherever cleanliness, sobriety, pure air, and pure water are enjoyed, there the genius of cholera never or rarely is known.”

These awful revelations may appear almost incredible to those unacquainted with the homes of the London poor in populous districts; but scenes like these, varied only in their degree of intensity, are familiar to the medical officers and others, who habitually visit these miserable abodes of sickness, suffering, and death.

Mr. *Byles*, another of the surgeons of the Whitechapel Union,

speaking of Hunt-court, Mile-end New Town, containing about 300 inhabitants, says,—

“Before the cholera appeared in the district, I predicted that this court would be one of its strongholds, and I recommended that a high wall at the eastern end of the court should be removed, as a free current of air from an extensive space of ground would thus be admitted. I do not think there is any other source of water than a stand-pipe, and, consequently, the stench from the open grating of the sewer is overpowering, I had last year (1848) more trouble with that court, in connexion with typhus, than any part of the hamlet.”

This prediction of Mr. *Byles* was fatally realised, since no less than 18 attacks of cholera occurred.

Irish Wakes.—Before quitting this notice of Whitechapel, it is proper to point out the enormous evils connected with the Irish custom of “wakes;” to which, independent of the utter demoralization induced, many lives were sacrificed. Mr. *Liddle* thus describes one of those scenes:—

“In Hairbrain-court, Rosemary-lane, an old woman having died of cholera without any medical attendance, an inquest was held on the body. Pending the inquest, which was adjourned, two children living in the same room were taken ill, of whom one died; and then the ceremony of wake was performed. About a dozen acquaintances of the deceased met together in this small room, 10 feet wide, 12 feet long, and 10 feet high; and with only one window, opening into a narrow, crowded, and, at that time, most filthy court. These people assembled in front of the corpses, some smoking, and all drinking. The other poor child, who was just beginning to recover from collapse, was lying in a corner of the room. Almost immediately after this scene, the father and mother of the children, who had been present at the wake, were seized with cholera of a very severe form, though they fortunately recovered; but another person, who had also been present, was attacked and died.”

CLERKENWELL.—The following case will serve at once to illustrate the character of the dwellings to which many of the poor of this vast metropolis are often consigned, and also the kind of influence which, in the present state of the law, stands in the way of their improvement. A charge of neglecting to visit a certain house where a case of diarrhoea had occurred was preferred against Mr. *Horner*, one of the medical visitors of Clerkenwell, and, being called before the guardians, he stated “he had not visited the house in question, because, being in an out-of-way corner, where there was a public dusthole and a dunghill, he considered it was a place inhabited by horses and not human beings.” Hereupon one of the guardians present, who happened to be the owner of the place to which the charge related, arose in anger, and expressed a doubt whether Mr. *Horner* had visited the locality at all, as he could not imagine how any person in the full possession of his senses could possibly fail of perceiving the house he had overlooked. Another guardian said, “the defence was quite satisfactory, and that, although his brother guardian might consider the place as valuable as diamonds, still a casual and unprejudiced observer might pass it by unnoticed.”

ISLINGTON.—Mr. *Liddle* gives the history of another very melancholy instance of the dire effects of a neglected sanitary condition, which, occurring on the verge of the country, shows that no advantage

of this kind can counterbalance the baneful influence of a locally poisoned atmosphere:—

"In Rutland-place, Holloway, out of about 120 persons occupying 10 houses, each of 4 rooms, about 10 feet square, 27 cases of cholera occurred within 4 weeks (22·5 per cent.), out of which 14 were fatal (11·6 per cent.); and every person in the row had severe diarrhœa.* The houses are double fronted, and have consequently no windows behind for ventilation, and no back yards. In one of the rooms of No. 4 seven persons lodge. Only two of the houses are supplied with water. There is no provision of any kind made for the drainage of this place, except at the privies, which I believe empty themselves into a drain; and as the ground-floors of the houses are not raised above the surface of the earth, they are very damp. At No. 10, nine persons were attacked with cholera, five of whom died. The medical officer informed me that many of the cases in this place were quickly fatal; some of the sufferers were seized at work and died in a few hours. After death had done its fearful work in this locality several of the children were removed to the house of refuge, and the plague was stayed."

Mr. Liddle adduces this as a proof of the disastrous results which were caused by the guardians neglecting to comply with the order of the Board of Health directing houses of refuge to be opened.

In Brand-street, Holloway, with 40 houses, the mortality was also very severe, 21 persons dying out of 350, or 6 per cent., and nearly all the inhabitants were attacked with diarrhœa:—

"Brand-street is entirely without drainage, and at the time of my visit," says Mr. Liddle, "the rooms of some of the houses were completely flooded, water to the depth of an inch or two lying upon the floors of the lower rooms, so that the persons inhabiting them were compelled to walk about in pattens. In some the floors were rotten, and stagnant water, to the depth of several inches, was lying underneath. At No. 7 and 8 I found the privies quite full, and in so dilapidated a state that in wet weather the water and the soil overflow into the sitting-rooms. At No. 7 three deaths from cholera occurred at the same time, and the like number in another house within a few doors. The houses in this street are exceedingly overcrowded, and this circumstance, together with the low moral condition of the inhabitants, Mr. Donald, the medical officer, thinks has contributed largely to the spread of disease."

Mr. Donald, in a report, says of Brand-street,—

"This street has been much improved by the parochial officers during the last year; but the houses are much overcrowded and dirty, and almost unfit for habitation."

After descriptions of this painful nature it can excite no surprise that Mr. Liddle concludes this part of his Report by stating that—

"nearly all the medical visitors of the unions which were under my superintendence have reported houses in various localities to be in such an unhealthy state as to be quite unfit for human habitation; and as many of them are incapable of improvement, the only thing remaining to be done is to pull them down."

HACKNEY.—The amount of damage done to house property in

* This is an enormous percentage, and exceeds, so far as I know, that in any part of London, among the inhabitants of an entire row or alley having an equal number of inhabitants. Some institutions, and of course single houses, have suffered more severely.

London owing to defective drainage, neglect, and filth, is a point of great importance as to the economical bearings of the sanitary question, and on which a large body of evidence might be adduced. The following is one illustration: in a newly erected street, Victoria-street, Hackney, the surface-water accumulates oftentimes so as to flow into the houses, the floors of which are below the level of the street:—

"Many of the houses at the time of the house-visitation were unoccupied on the ground-floor, in consequence of their being uninhabitable from the dampness thus caused: 60 cases of diarrhœa, 7 approaching cholera, and 3 deaths occurred in this street. At No. 11, with very bad drains and a full and offensive cesspool, the whole of the inhabitants, 11 in number, were suffering from diarrhœa."

The following case is particularly instructive, inasmuch as it is one of those well-marked instances in which the operation of a deleterious agent is unequivocally demonstrated:—

"Silkmill-row," says Dr. Gavin, "contains 14 houses, 2 of which are empty, and in the other 12 are 85 inhabitants. Owing to the nuisance caused by the privies emptying their contents into what was formerly the milldam-head, these were pulled down in August last and cesspools were made. The first cesspool was sunk in the middle of July, within one yard of the only well which, with the exception of one house, supplies all the inhabitants with water. Three other cesspools were made at the distances of 3, 5, and 12 yards from this well. About a fortnight or three weeks after the first cesspool had been made, the inhabitants observed the water become tainted and offensive; it gradually became worse until, when I saw it, that fresh drawn in the morning was as thick as thin soup, with feculent matter. The landlord's agent employed himself an hour every morning in pumping off the thickened water in order to fit it for consumption and use. After his morning's work he declared the water to be quite good enough for the inhabitants. Those who do not choose to drink and cook with this most foul water are compelled to catch the surface water which flows along the kennel from the road and neighbouring field. This water, which at other times would be considered foul, appears pure when compared with that used by the unfortunate inhabitants of this place."

A table is given in the Report showing, in reference to this row, the following results: "Of 85 inhabitants, 2 having a separate spring, and 20 not then drinking the foul water, but using that of the kennel, were free from diarrhœa; of the remaining 63, all except the landlord's agent and his wife, who do not use the water, and 2 others, suffered from diarrhœa, 46 cases of which, and one approaching cholera, were discovered and treated by the medical visitor."

WESTMINSTER.—Dr. Waller Lewis, the medical inspector of several of the western parishes, and to whose Report I am indebted for much valuable information, states that a great many fatal cases occurred in this parish. Its present population is estimated at 62,881. During the four months ending October 20 there were 425 deaths from cholera alone, being at the rate of 2 per cent. per annum from one disease. Dr. Lewis adds—

"Any one conversant with the state of many parts of this low, dirty, overcrowded district, would be at no loss to account for this mortality."

One of the visitors says of Pump-court,—

"Inspected the lower rooms of the houses; nothing can describe the beastly state of this place. The inhabitants would not permit us to go up stairs. One of the neighbours, from a more decent part of the court, said he could not state how many persons sleep in the houses at the top, but believes as many as 50 or 60 in a room; 'sees large numbers turn out in the morning; Irish wakes and all sorts of horrors are carried on.'"

Dr. Lewis reports, however, that the authorities

"had done much of late towards removing some of the worst nuisances in the poorer parts of the parish.

"Mr. Rogers, the solicitor to the Board of Guardians, gives me the following account of what has been accomplished during the last 12 months:—

" 450 cesspools emptied.
142 drains cleansed.
42 accumulations of filth removed.
430 pigs disposed of.
162 houses thoroughly whitewashed."

The same gentleman states his belief that there is not a single pig in the parish at the present time. Magistrates' orders have been universally obtained for their removal, and as universally acted on—a striking contrast to the want of energy shown in some other parishes in regard to this species of nuisance.

SHOREDITCH.—This parish suffered severely from the epidemic, and, as in all other instances, certain definite localities experienced the full force of the pestilence. Thus in Windmill-square the mortality, although happily limited as to numbers, was, relatively, frightful, half the inhabitants having perished. The following is Dr. Gavin's history of this visitation:—

"Windmill-square consists of 5 houses in a small square; a stable and cow-shed and 2 small houses occupy one side—three similar houses the opposite side of the square; 22 persons inhabited these 5 houses. In a few days 11 of these persons died of cholera:—of 1 adult inhabitant, at No. 1, 1 died; of 5 inhabitants at No. 2, a child died; of 7 inhabitants at No. 3, the mother and 3 children died; of 5 inhabitants at No. 4, the mother and 2 children died; of 4 inhabitants at No. 5, the mother and son: the deaths followed in rapid succession.

"Now, the supply of water to these 5 houses is from a pump, originally sunk 18 feet; but on the formation of the sewer it was sunk to 24 feet, as if to insure the reception of the water percolating from it. Near the centre of the small square of 50 feet a cesspool was dug to receive the surface-drainage of the houses, and to relieve the cesspools of the fluid matters; also, to receive the drainage from an adjoining stable. Within a few feet of the pump a hole had been dug to receive water to water the square, laid out as a garden. Into this hole decaying vegetable matter had been thrown, and was accumulated. Moreover, the soakage from a large heap of manure—the refuse from the stable and cow-shed which occupies the place of No. 1, and which had been accumulated and piled up at the end of the roadway and in front of No. 1—not more than 25 feet from the well—passed into the well. (This refuse has been since removed.) The adjacent road is badly drained; and a cesspool under the grating in the centre serves to retain much fetid refuse; doubtless the drainage and fluid contents of this cesspool percolated through the soil and found their way to the well, which is the lowest level. It is impossible to stand close to this pump without perceiving a nauseous and offensive smell arising from it. There is no doubt that the state of the water, holding as it did organic matter in solution, was the

remote cause of the heavy mortality which swept away, in a few days, one-half the inhabitants of the square."

Union-street, between the Hackney-road and Kingsland-road, holds the next place; 10 deaths from cholera took place here, and 190 cases of diarrhoea and 4 cases of cholera were discovered by the visitors:—

"The street is one of the filthiest in the parish; the roadway the most broken up, so that stagnant mud covers its surface the greatest part of the year. It is altogether in a condition incompatible with healthy existence."

One district of the parish, consisting of the old part of Shoreditch, namely, "Shoreditch proper, and its continuation, the High-street, Shoreditch," together with the streets and alleys leading out of the main thoroughfare, was so pre-eminently distinguished as to create general alarm in that quarter of the metropolis; and the case is the more instructive, inasmuch as the families of many respectable shopkeepers suffered, proving that it was not dependent on distress of any kind. I myself saw eight or ten shops closed at one time in the main street, almost within a stone's throw of each other. Dr. Gavin, in his Report, says,—

"In this small space, forming a mere fractional part of the parish, about one-twelfth portion of the inhabited part, more than one-fourth of the total mortality (exclusive of that which occurred in the workhouse, the lunatic asylum, and the refuge for the destitute) which occurred in the parish took place.* The causes which, from my investigations, chiefly led to this excessive mortality may be referred not to overcrowding alone, because there are many other parts of the metropolis, and even of the parish, as densely populated; not simply to want of drainage (there is the strongest proof that the regurgitation of the contents of the sewers along the house-drains into the cellars of the houses in the main streets was a chief predisposing cause in numerous instances to the death of parties whose condition and habits of life were those of the respectable middle class); but to the concentration of malaria through the great amount of decomposing animal and vegetable matter which abounds in this locality. It is impossible to believe, passing through this main street, that so great an amount of filth, refuse, and foul matters, should be found in and around the dwellings; that so great a number of pigsties, bone-boileries, dog-and-cat's-meat-manufactories, and tallow-melting establishments on the large scale, and so great a number of small dealers in animal and vegetable matters on the meanest scale, should exist in a densely crowded and closely built locality. The noxious trades and occupations which so greatly abound here exerted a most deleterious influence upon the health of the inhabitants. This is proven by the fact that, wherever such disgusting and offensive preparation of putrifying animal matters was carried on, cholera carried off its victims in the immediate vicinity. The inhabitants themselves were so thoroughly impressed with a sense of the danger arising from the unrestricted toleration of such pest-breeding nuisances, that they were most earnest in their entreaties that effective means of relief should be employed or devised to free them from the danger to which they were constantly exposed; the total immunity possessed by the owners of such public and grievous nuisances was complained of as a gross neglect, on the part of the General Board of

* The deaths in the district referred to amounted to 188; the total deaths in the parish being 723.

Health or the Government, of the interests of the public. It is scarcely necessary to add that there is no law to deal with such noxious influences."

KENSINGTON.—"The Potteries."—One of the most deplorable spots in the metropolis, the mortality in which during the late epidemic was very high, is a place called "the Potteries," situate in the important parish of Kensington, the circumstances connected with which illustrate so many of the existing sanitary evils, and the almost insurmountable difficulties that in the present state of the law oppose their removal, as to demand in this Report special attention. The awful mortality and sickness afflicting the inhabitants of the Potteries, and the causes inducing it, have attracted the special notice of all the medical officers of this parish. Mr. Frost, who is the medical officer of the district, has drawn up a most valuable Report on the subject, from which the principal facts about to be stated are derived. At Christmas, 1848, the population of the Potteries was 1056; it is now decreased, from death and other causes, to something between 900 and 1000:—

"During the three years ending December 31, 1848," says Dr. Lewis in his Report on Kensington, "there were 78 deaths, or 26 in 1000; of these 61 were under 5 years; the average duration of life for those 3 years was 11 years and 7 months. In the first four months of 1848 there were 42 cases of smallpox in the Notting-hill district, the poorer part of the population of which amounts to about 5107; of these cases two-thirds occurred in the small locality of the Potteries, which thus suffered between nine and ten times more from smallpox than the rest of the district. In the first 10 months of 1849 there have been 50 deaths among, at most, 1000 persons: this is at the rate of 6 per cent. per annum, an enormous mortality. Of these 21 were from cholera and diarrhœa, and 29 from typhus fever and other causes. In 3 months (1848-49) Mr. Frost, the medical officer, attended 32 cases of fever, that is at the rate of 128 cases in a year among 1000 persons. It is illustrative of the common points between cholera and other zymotic diseases, that the former appeared not only in the same streets, in the same houses, but in the same rooms, that have been again and again visited by typhus. Mr. Frost pointed out rooms where three or four persons had recovered from fever in the spring, to fall victims to cholera in the summer. Nearly all the inhabitants look sallow and unhealthy; the women especially complain of sickness and want of appetite; their eyes are sunk, and their skin frequently much shrivelled: The eyes of the children glisten with unnatural moisture, as if stimulated by ammonia."

In the above extract is revealed an amount of sickness and death which may be equalled, but can scarcely be exceeded by any part of England. A deep sensation was excited in the public mind when, in the course of the sanitary inquiries a few years ago, it became known that the mean age at death among the operatives of Manchester and Liverpool was only 15 or 16 years, whilst that of the gentry in the same town was 43 years, thus showing that the former lost 28 years of existence, for the most part owing to removable causes of disease. But here, in one of the richest parishes in London, surrounded by splendid villas and streets, is a population of 1000, among whom for the period of three years the average age at death was 11 years and 7 months, whilst of the total deaths the enormous proportion of 67·5 per cent. were below the age of 5 years.

Causes of this excessive Mortality.—All who are acquainted with

the laws of disease would at once infer that, to produce such an amount of sickness and death, there must be some most deleterious agents at work; the following details afford the explanation. In March, 1849, Mr. Lovick, who, by direction of the Commissioners of Sewers, examined the Potteries, stated that no fewer than 3000 pigs were kept in them. Dr. Lewis mentions another source of pollution arising from the boiling of fat—an operation which the Inspector of Nuisances states taints the atmosphere for half a mile round. Water is supplied to but a small part of the tenements, though the occupation of the people requires evidently a very large quantity of this element; a few wells have been sunk, but in many cases they have become useless from the organic matter soaking into them:—

"Stagnant water, disgusting to see, but still worse to smell, is found at every turn; in the streets, in the courts, in the alleys, and in the yards, not a drop of clean water—all is charged with organic matter. The paint on the window-frames, &c., originally white lead, had in a few months become in almost every situation black from the action of the sulphuretted hydrogen generated in all directions around."

One large stagnant piece of water is called "the Ocean;" and when I inspected this place by direction of the Board of Health, I found it covered with a filthy slime, and bubbling with the poisonous gases, caused by the drainage of pigsties and privies flowing into it. On the very border of this pond is placed St. James's National School, with about 130 children, whose health is reported to have seriously suffered. Many of the dwellings are mere hovels, with privies and sties close to them. That there should be such an extreme of physical degradation—which, it is affirmed, as to dirt, filth, and misery, is unsurpassed by anything known in Ireland—without a corresponding moral abasement, would be all but impossible; it is not, therefore, surprising that Dr. Lewis should remark that—

"The manners of the people are more uncivilized and rough than I have observed in other parts of the metropolis. A woman, living in a hovel more than usually dirty and offensive, pointed to a pig which her only daughter had brought up by hand: the poor child had died of cholera."

Repeated attempts have been made to remove the swine, which are the essential cause of all this misery. The medical officers of Kensington parish—Mr. Frost, Mr. Godrich, and Mr. Guazzaroni—much to their credit, and amidst great discouragement, have made several communications to the Board of Guardians, showing the sacrifice of life that directly results from this huge nuisance. The Board of Health instructed me to inspect the place; and a second examination was made by Dr. Milroy. I attended the Board of Guardians, among whose number is the owner of a part of the property, and urged upon them the necessity of the immediate removal of the pigs. Some steps were taken, and an order for the removal of the swine was made by the magistrate; but, notwithstanding various efforts on the part of the Board of Health and of the medical officers, this order has never been enforced, and at the present time (February, 1850) the pigs still remain, although diminished in number, and with them all the evil attendants described above. The medical officer states that, notwithstanding there has been a great diminution of the population, so that it must now be considerably less than 1000, the

cases of sickness in the Potteries are as numerous as in the remaining part of the district with a poor population of 4051.

Beneficial Results from Sanitary Measures.—It is the more remarkable that the local authorities of Kensington should thus neglect to enforce the law in a case affecting the health and lives of so many persons, since, in the same neighbourhood, a most striking example of the beneficial results following the removal of precisely the same source of mischief has occurred. Camden-place was occupied in 1848 by a similar class of pig-fatteners, 23 of whom were summoned before the magistrate at the Hammersmith police-court, who ordered the pigs to be removed, allowing two months for that purpose. The majority of the people complied, but some refused; one of these was fined 10s. a day till the nuisance was removed, and, after a fine of 2l. had been incurred, the animals were taken away. This amelioration was effected before the cholera, which produced such dire results in the Potteries, had broken out in this part of the metropolis: the results, which were most striking, are thus stated by Dr. Lewis in his Report:—

“During the first ten months of that year (1848), with a population of 513, there were in Camden-place eight deaths, while, after the removal of the pigs, and the consequent cleansing of the street, with a population increased to 532, there was but one death in the corresponding ten months of 1849, although a most fatal epidemic has been superadded to other ordinary causes of mortality.”

Evil not confined to the Potteries.—Before closing this notice of “the Potteries,” it is proper to point out what, to medical men, and indeed to all disinterested persons, must be obvious, that it is not alone the wretched inhabitants of the place itself that have suffered from the state of things above described; but also persons living at a considerable distance, as the following statement, contained in Dr. Lewis’s Report, distinctly proves:—

“Some 1200 or 1300 feet off is situated a row of clean, respectable houses, called Crafter-terrace, Latimer-road; the situation, though rather low, is clear and airy. On Saturday and Sunday, the 8th and 9th of September, 1849, the inhabitants complained of an intolerable stench; the N.E. wind blowing directly upon the terrace from the Potteries. Till this time there had been no case of cholera among the inhabitants. The next day the disease broke out violently, and on the following day, the 11th, a child died at No. 1; on the 12th a person died at No. 2; on the 13th one died at No. 5; and another at No. 7; on the 14th, another child at No. 1; on the 15th, a second child at No. 5; and on the 22nd, an adult at No. 9.”

Although there cannot be given demonstrative evidence to prove that this severe outbreak was directly induced by the poisonous effluvia, a large number of facts induce me to concur entirely in the opinion of the medical officer. Violent and sudden outbreaks of choleraic diarrhoea, affecting simultaneously large numbers of persons, as will be shown in the section on the predisposing causes, came to my knowledge during the late epidemic, in which it was certain that the sole exciting cause was the exposure to putrid animal effluvia. In the present instance the poisonous exhalations were distinctly perceived at Crafter-terrace; and it is well known that places at the distance of

half a mile from an active focus, like the one in question, are liable to be affected injuriously by effluvia wafted by the wind.

LAMBETH.—There are various circumstances which have co-operated to give force to the epidemic influence in this part of the metropolis. Many of the streets, owing to the low marshy character of the southern parts of the Thames, are built on swampy ground, demanding consequently all the appliances of art and science in respect of efficient drainage to render them a safe abode for human beings. But so far from this being the case, there are large tracts of open stagnant ditches in various parts of the parish. The water-supply is most defective as to quantity and quality; numerous instances of the evils consequent on which were reported in the progress of the epidemic. In a special Report by Dr. Gavin on the district “Waterloo-road, Second part,” where the mortality was excessive, it is stated that the water supplied by the Lambeth Waterworks was in some of the courts quite muddy, bearing no appearance of having been filtered, and “having a fetid smell and replete with insects.” In some of the courts 70 or 80 persons were dependent on one tap, without any cistern, and that situated in many instances near a privy, the gases emanating from which had a most deleterious effect upon the water. The supply is thus so limited that “a very active scramble occurs to secure the precious fluid,” which, as at the place called “The Apollo,” with 51 houses, and where 12 fatal cases of cholera occurred, flows only for about 30 minutes daily. In a limited locality comprising five streets, and included between two ditches extending from the Westminster to the Waterloo road, and open nearly throughout their entire course, 42 persons died of cholera, a great number experienced severe attacks, and it is believed there was scarcely a house in which the inmates did not suffer from diarrhoea. Grove-place, James’s-street, is a dirty, confined locality, and in it three fatal cases of cholera and many of diarrhoea occurred: in the first house in this place eight out of its eleven occupants were attacked with cholera, and two died; the house is badly ventilated and out of repair, whilst in the back kitchen is a deep pit, receiving the soil from a privy, and sending forth a stench quite overpowering:—

“A more dangerous nuisance could scarcely exist, and would long since have been removed, had the district been under the inspection of an officer of health.”

Many instances of the mischievous effects caused by the use of tainted water occurred in other parts of the parish, of which the following, mentioned by Mr. Smyth, one of the medical officers, is an example:—

“In many of the courts about Lower Fore-street, where cholera prevailed to a great extent, there is no supply of water. In Windmill-court he saw one of the most severe and well-marked cases of cholera he had witnessed; and a second case having occurred in the same court, his attention was attracted to the pump which supplied the court. On examining the water he found it was discoloured, and was so foul that it stank at a distance of the contents of a cesspool. In this court most malignant scarlet fever, with sloughing of the integument, and very bad typhus fever, have occurred; all these evils he is of opinion may have depended on the foul state of the water; and having represented this to the authorities, the Inspector of Nuisances removed the piston of the pump.”

In Lambeth, owing to the number of houses which have been pulled down in Westminster and other parts for the recent alterations, it has happened that there has been a great influx of Irish and other labourers, who, as no additional provision was made for them, necessarily caused a great overcrowding of the miserable domiciles, already overfull. This circumstance has attracted the attention of the local authorities as an additional evil: thus Mr. *G. Sutton*, Inspector under the Lambeth Improvement Act, states that—

“There are now more Irish than he has ever known; in a house in Broad-street he has known 24 Irish lodging at one time—there being three bed-rooms and small attic.”

There are also in the most densely populated parts of this parish several bone-boiling establishments, which, in a disease like cholera, must, by their poisonous effluvia, have greatly exasperated the late epidemic.

As I have already presented a special Report on this subject to the General Board of Health, it will suffice to state that, according to Dr. *King*, one of the medical inspectors of this parish—

“The deaths from cholera and the cases of diarrhoea have been very numerous in the districts around the bone-boiling establishments, few of the poor people escaping.”

Up to the 14th of September, 1849, 300 cases of diarrhoea, all of which were successfully treated, were reported as having been discovered by the visitors in this locality. Dr. *King* says—

“On coming within a quarter of a mile of the premises, the visitor is perfectly nauseated with the rank effluvia proceeding from the bone-boiling; and if the sickness and feeling of illness experienced by a casual visitor be any criterion, the surrounding population living on the spot must be fearfully predisposed to attacks of cholera.”

The streets near the river are subject to a special evil, owing to the flooding from the Thames, which takes place several times yearly. Mr. *G. Sutton* states in evidence that on these occasions—

“the water which is driven up through the sewers forces out a quantity of offensive matter, the privies are often overflowed; this has happened in his own cellar, the water rising to 5 and 7 feet; there is usually 2 or 3 inches of deposit left which has a bad stink, because the fact is, that the soil comes up from the privy; his walls have never been dry for 15 years, and so they can never lime-wash the lower rooms.”

On one of my visits I witnessed this phenomenon in Fore-street, the water having flowed up through the privy into the small yard, and thence into the back part of the house. Mr. *Fall*, formerly vice-chairman of the Board of Guardians, states that on these occasions the poor suffer greatly, their bedding being damaged from this foul stream thus penetrating into their living-rooms. The relieving officer of this district says,—

“There is a considerable amount of sickness; low fever, measles, small-pox, scarlet fever, and consumption prevail, and in consequence a large expense is incurred for relief.”

In Broad-street, which has, according to Mr. *G. Sutton*, who resides in it, only eight houses, seven deaths from cholera are reported. It is stated by the same witness the rent is considerably reduced owing to

the damage caused by the tide; his rent has been lowered from 25*l.* 4*s.* to 15*l.*, but, “it would have answered his purpose better to have paid the original rent,” if this great nuisance had been remedied.

ROTHERHITHE.—In the parish of Rotherhithe one influential circumstance which operated to raise the mortality higher proportionally than any other district in London, was evidently the noxious quality of the water used for domestic purposes. The evidence of Mr. *Chandler*, the medical officer of this parish, who had the superintendence of the measures adopted to meet the epidemic, and who himself saw about 600 cases of cholera and 3000 of diarrhoea, places this evil state of things in a strong light. After the cholera had shown itself lightly for several months by isolated attacks, at the end of June there was a sudden and violent outbreak.

“The disease began on the last day of June in a certain street, and in 16 houses 20 cases occurred. All these houses were supplied by one well, the water of which was derived from the Thames, and was moreover expressly ascertained to be contaminated by infiltration from a foul open ditch. Several of the persons who died were decent mechanics, and not in destitute circumstances. In another street with about 25 houses, each having on an average two families, and where the epidemic was very severe, 15 deaths at least having occurred, the water was likewise very bad; in fact, it was taken out of the ditches communicating with the river, and which ditches received the matter from the privies.”

Mr. *Chandler* says, in connexion with these circumstances—

“As to the influence of bad water, his opinion is, that in some instances it decidedly acted as a predisposing cause, and tended to the spread of the disease.”

The Rev. *G. Blick*, rector of Rotherhithe, and chairman of the Board of Guardians, and who rendered most valuable services to the suffering poor, says,—

“he was constantly occupied in aiding with the guardians in the preventive measures during the height of the epidemic; observed in some cases where the disease had been very severe, and where the water was tainted, that, on supplying pure water and having a medical man in constant attendance, the cholera was controlled to a marvellous extent, few cases occurring subsequently. Is convinced from the facts that came to his knowledge that the bad quality of the water in certain localities acted most prejudicially as a predisposing cause, and led to the spread of the disease.”

With respect to this case of Rotherhithe, the fact of the people in the first street mentioned having been the earliest victims on the great outbreak, shows that they must have been highly predisposed; and as they lived in decent houses and were in comfortable circumstances, two of the more ordinary causes of the disease, overcrowding and poverty, could not have operated. These considerations can leave no doubt that the one main cause of the great severity of the attack was the use for domestic purposes of Thames water, further polluted by sewer matter, into which privies emptied their contents.

ST. PANCRAS.—Although this district, collectively, suffered but slightly, the mortality being in the ratio of 3 in 1000, yet in certain localities the attacks were most virulent; and as some of these localities were in the close vicinity of the model “Metropolitan Buildings,”

which, as will presently appear, entirely escaped, it is desirable briefly to glance at the epidemic in St. Pancras. In Paradise-place, a few hundred yards from the model establishment, according to the medical officer, Mr. Eascott, three fatal cases occurred in one house, and evidently owing to its wretched sanitary state. The family lived in a room over a very filthy stable; the floor was full of openings, so as readily to allow the foul effluvium to pass through. Besides this nuisance there was a heap at the door, consisting of horse-dung and putrid fish. Cholera also occurred in Adden-place, leading out of Paradise-place, and from this court the medical officer sent four cases of typhus to the Fever Hospital in the spring of 1849. There is a pigsty at each end of Paradise-place, and the supply of water is from a well and very insufficient in quantity. Mr. Popham states, that in a street in his district, in which the houses are very crowded, the drainage very bad, and the people unhealthy, five cases of cholera occurred in one house. The occupants of the kitchen-floor in a part of this district complained that, owing to the horrible stench from the drains, they could not shut the windows at night. In several of the houses in this parish all the inhabitants were affected with severe diarrhœa.

ST. MARYLEBONE.—Many parts of this parish are in a most defective sanitary state, of which the following are a few examples. Mr. Buxton, resident surgeon of the Western General Dispensary, states, in a very valuable Report with which he has favoured me, that—

“Tooton-court, Crawford-street, a low and filthy place, full of dungheaps, stables, &c., suffered very greatly, three cases having proved fatal. Devonshire-place is a close court, consisting of high houses, with the drains in a bad state: 10 or 12 cases of cholera occurred here, of which six or seven were fatal; five cases took place at No. 16, where the smell from the drains was almost unbearable.”

Mr. Buxton adds, the persons suffered intensely who live over stables and cowhouses, of which there are so many in the mews of this parish, and which, owing to many fashionable families having quitted, have been converted into dwellings. There is another class of tenements in this parish, extensively populated, which exert a most pernicious influence over the health of their inmates, and which will be noticed in a future page.

HIGHGATE AND HAMPSTEAD.—In tracing the influence of locality over epidemic diseases, the most instructive information is to be obtained from the investigation of those instances where, in the midst of a district otherwise distinguished by its healthfulness, severe attacks occur; inasmuch as in such cases it is obvious that there must be some extremely limited, well-defined, and consequently discoverable morbid causes in operation. Several such instances, both as regards fever and cholera, have come under my notice; and it may be affirmed a careful investigation has shown that, in all, the influential conditions related to places and not persons. During the late epidemic, the villages of Highgate and Hampstead, which are celebrated among the inhabitants of London for their healthy and bracing atmosphere, were particularly distinguished as being almost entirely exempt; in each there was, however, a circumscribed but severe attack, the circumstances connected with which were investigated by Dr. Milroy, from whose valuable

Report the following details are principally derived. In Highgate, with a population of about 3000 inhabitants, six cases of cholera occurred, all among the members of one family, living in two adjoining houses; the history of these cases is so instructive in various points of view, as to justify a somewhat detailed account. The first case was that of the wife of a thriving drover; this woman had had diarrhœa for 2 or 3 days, but had neglected it; she was seized on August 27, 1849, with all the symptoms of malignant cholera very soon after having eaten freely of eels for dinner: she died at 2 p.m. on the following day. On the morning of the 28th one of the sons was attacked with severe vomiting, purging, and cramps; he gradually recovered. The father was taken ill on the morning of September 3rd; but nevertheless he went to Smithfield market, where he became so much worse that it was necessary to convey him home immediately; the symptoms yielded to treatment, but fever set in and he died on the 6th. The fourth case was that of the sister of the first woman, who lived in the adjacent house and had assisted in nursing the sick; she was attacked on the 4th and died on the 7th. As she was dying, the drover's daughter, who resided with this aunt, was suddenly taken ill and died on the 12th; she had waited on her father and mother during their illness. The sixth and last case occurred in the son of the drover; he gradually recovered.

These cases, on the face of them, would appear to favour the idea of human contagion; but the following circumstances afford another and it is believed a more true explanation of this melancholy visitation. The two houses in question are situated in a place called Swain's-lane, which had long been notorious among the inhabitants as being, from its many nuisances, the most offensive spot in Highgate; moreover the worst of these nuisances were concentrated in the upper part of the lane closely adjoining the two houses:—

“On one side is a large cow-shed, where an immense accumulation of dung is often collected, polluting the atmosphere all round to a considerable distance: the drainage from this dung-yard, as well as from several privies, is conveyed underground to an open drain or channel on the opposite side of the lane, down which it runs for several hundred yards immediately in front of a row of small houses. The stench from this sewer is so disgusting that none of the respectable inhabitants of Highgate hardly ever pass along the lane, and even the visitors of the adjoining cemetery avoid that part of the ground which is nearest to it. Whenever any epidemic disease exists in Highgate, the medical gentlemen assure me that it is invariably most prevalent and severe among the inmates of the houses in the lane; and so confident was Mr. Moger that if the cholera visited Highgate it would make its appearance in this particular locality, that he made repeated complaints last summer to the Board of Guardians of St. Pancras respecting the unwholesome state of Swain's-lane.”

A local sanitary committee was appointed some months prior to the fatal attack, and the very first object to which they directed their attention was the state of this Swain's-lane; repeated representations were made to the guardians of St. Pancras, but without avail. Application was also made to the magistrate at Marylebone to have the nuisance corrected, but with no better result.

“But, besides the general insalubrity of the locality from the causes now mentioned, there was, in the back yard of the house where the first cases

occurred, a foul overflowing privy immediately facing and within a few feet of the back door. The stench from this was horrible, Mr. Moger says, especially at night, when he had to remain some time in the room with his patients, while the disgusting effluvium from the filthy cow-shed opposite quite sickened him as he approached the house. With so polluted an atmosphere continually around them during a period of epidemic sickness, no one can be surprised that the cholera found them out, and produced such fatal results in one family."

Instance of Hampstead.—In the district of Hampstead, with a population of 10,093, nine deaths from cholera were returned by the Registrar-General; of which one was imported, being that of the Rev. Mr. H—, who was one of the victims of the severe outbreak in Albion-terrace, Wandsworth-road; he came to Hampstead-heath on August 8, 1849, was seized next morning, and died in 8 hours. Of the few attacks originating in the village itself, no less than six, four of which were fatal, occurred in a family living in rooms over a stable, thus described by Dr. Milroy: at the stable door was a dungpit, which had not been emptied for some weeks; in the stable, in addition to the ordinary sources of impurity, there were 3 or 4 pits made to collect the urine of the animals and usually emptied twice a week; in the yard at the rear, and into which one or two windows looked, was a privy that stunk abominably, and within two or three yards of it a pigsty scarcely less offensive; the privy had been most injudiciously emptied out a day or two after the first death took place.

Another locality, where two fatal cases of cholera took place, was thus described by Mr. Lord in a pamphlet published in 1847:—

"The atmosphere from cesspool and drains is most loathsome. A painted chair which has been left on the ground room is blackened by the sulphuretted hydrogen escaping through the boards. A tame bird, which had lived a year in another house, died soon after being removed; the cat has died. Seven or eight cats have died there. 'Nobody can keep their cats alive there.' The man, a shoemaker, works at his trade, and smokes tobacco to disguise the smell. The rent is 5s. per week."

Instance of Albion-terrace, Wandsworth-road.—Dr. Milroy has given another important report relative to one of the most severe outbreaks of cholera that occurred in the metropolis, namely, that of Albion-terrace, Wandsworth-road. This place consists of 17 houses, letting for 50l. and 60l. a year, and having the appearance of commodious, comfortable dwellings; calculating seven persons to each house, the total population would amount to about 120 persons. The first case of cholera took place on July 28, 1849, at No. 13; and up to August 12, no fewer than 42 cases occurred, of which 30, or 71·4 per cent., proved fatal. It is evident that there must have been some unusual circumstances to explain this awful mortality; and the information obtained by Dr. Milroy shows very unequivocally what these circumstances were.

"About 200 yards in the rear of the Terrace is an open black ditch known as the 'sewer in Battersea fields,' and which receives the drainage from Clapham, Streatham, and Brixton Hill. The inmates of several of the houses complain of offensive effluvia perceived in their gardens behind when the wind sets in a particular direction. But it would seem that there is a source of foul exhalations much nearer the dwellings than this black ditch. In almost every house the servants complain of a stench in different parts of

the kitchen floor, and more especially over the sink in the back kitchen. This nuisance, always present to a greater or less degree, became much worse immediately after the heavy storm of rain on the 26th of July, and at the very same time the water was found to be not only muddy, but positively fetid, so that it was utterly unfit for use.

"Besides the effects of the late storm already noticed, a drain or sewer, which crosses the Wandsworth-road, and passes under No. 8, burst open on the evening of the 26th ult., and inundated the whole of the lower premises of that and of the adjoining house, No. 9, with its black and fetid contents. The cellars of these houses are still damp and offensive.

"There was another most pernicious source of insalubrity that is still more to be deplored, seeing that it might have been so easily prevented. I allude to an enormous accumulation of most offensive rubbish in a cellar of No. 13. It appears that this accumulation must have been going on for 18 months or a couple of years at least, as, when removed on the 30th or 31st ult., it amounted to seven or eight cartloads of what is described as a most disgusting compound, swarming with maggots and exhaling a putrid effluvium.

"It was at this house, No. 13, that the first case of the fatal disease occurred on the 28th of July, in one of the servants, who had been affected for a day or two previously with diarrhœa and had not attended to it. Her sister, who had come from the country to nurse her, was seized a few days afterwards and also died. Most of the members of the family were affected with diarrhœa; they had gone to the country and the house was deserted. About the same time, the disease began to manifest itself in other houses of the Terrace, and in many instances with terrible virulence. The entire household of No. 6 has been swept away."

The nature of the water-supply is very important. On this Dr. Milroy remarks—

"The whole of the underground arrangements for the supply of water to and the removal of the drainage from the houses was found to be most faulty and imperfect. The suspicion expressed in my former Report that the water-tanks or cisterns and the cesspools were in close proximity to each other, and that the water in the former had become contaminated with the contents of the latter after the heavy storm of rain on July 26, proved on examination to be correct."

Influence of Graveyards.—The influence exerted by graveyards in the development of cholera is intimately connected with the point under consideration; but a special Report having been already published by the General Board on the subject of extramural sepulture, it will not be necessary to refer to it in the present document. It may, however, be observed, that abundant evidence has been collected, especially by Dr. Milroy, to prove that in the metropolis the most offensive putrid effluvia escape from the burial-grounds; that these are predisposing causes of disease, and especially of fever, disturbance of the alimentary canal, and of various affections depending upon a poisoned condition of the blood, and that in the houses immediately adjoining these places cholera was observed to prevail. It is known that a most distinguished surgeon, whose valuable life fell a sacrifice to the late epidemic, resided in a house the back windows of which looked directly into a graveyard; that he was much in the habit of sitting at these windows when opened; that he had complained to his servant several times shortly before his attack of the offensive smell proceeding from the burial-ground, in which some cholera corpses had been interred; and that on the very day of the fatal seizure a grave had been dug which attracted his attention as having increased the noxious effluvia.

COMMON LODGING-HOUSES.—The enormously overcrowded and filthy condition of the common lodging-houses of London is well known to the parochial authorities, among whom, so far as I have made inquiries, there is a general wish that they should be improved, inasmuch as they are known to be a source of epidemic disease, as well as of every species of moral contamination.

ST. GEORGE'S, SOUTHWARK.—In the month of February, 1849, a severe attack of cholera occurred in two of the lodging-houses in the Mint, Southwark, in one of which four cases and two deaths occurred, and in consequence I inspected several of these places, and having on former occasions visited other establishments of the same kind, I am bound to state that I have witnessed scenes which no language can describe. The beds are placed in every possible direction, occupying not only the rooms, but the landings on the stairs and passages; the people are huddled together two, three, or more in a single bed, children often occupying the foot and the adults the top of the same bed. Many of the dormitories, as I saw in the Mint, had no fire-place, and even where this opening existed it was from ignorance closed up by boards, so that in many instances these rooms at night would be almost hermetically sealed; added to which, in several parts of London, there being no privies provided, the most bestial matters are accumulated. Some of the houses I examined professed to receive 100 lodgers, others 60. All this causes an oppressiveness and stench utterly insupportable to strangers and absolutely incompatible with health: and yet in these wretched abodes, where all ages and sexes commingle together, some families actually take up their residence as it were their home. I have seen married people with their children who said they had lived in the same house for two or more years. In the better conducted establishments the married couples have rooms allotted to them, but in others no such separation is attempted, all sleeping indifferently in the common dormitories.

WHITECHAPEL.—The following is a description of a low lodging-house in Parson's-court, Rosemary-lane, by Mr. *Straw*, a guardian of the Whitechapel Union, and an active member of one of the local sanitary committees:—

"I went at night to visit this house; the room I first entered was 12 feet square, in which I found 20 persons of both sexes and all ages lying on the floor;* in another room there were 14 more in the same state. I went into another room, but did not count the number, being overcome with the stench of the room and the scenes I had witnessed. Before returning home I went into another house of a similar description in Hogg's-court, Dock-street, and there witnessed the same disgusting and degrading sight. If Government knew the demoralised state of society in such neighbourhoods, I feel confident they would instantly take steps to improve it."

Mr. *Filliter*, a medical visitor, gives a similar description of lodging-houses in Wentworth-street, in the Whitechapel Union: in the attic of No. 69 he found 22 beds with scarcely any interval between them.

* This would give 86 cubic feet for each person, whereas, at the lowest calculation, 500 ought to be allowed: in barracks 800 cubic feet is the allowance for each soldier.

KENSINGTON.—The sanitary evils of Kensington are not confined to the Potteries, noticed in a preceding page. Dr. *Lewis* says,—

"But if the Notting-hill division of Kensington has its Potteries, the town division has its Jennings'-buildings and Hooper's-gardens. These consist of a large number of houses, in close narrow courts and alleys leading out of High-street, let by the owners to small shopkeepers and others, who underlet them to third parties; these again sublet them to tramps and others, who pay for a night's lodging. Threepence for a single man, and sixpence for a couple with a child or two, if a single bed only is occupied, is the usual charge. One room, 14 feet by 14, is occupied by four married couples; a back room, 15 feet by 19, is occupied by three married couples, and three single women; while the front room, through which they pass, contains a married couple and a single man. The rooms are, in almost every instance, unprovided with chimneys, or ventilation of any sort except a small square window; and this is often rendered almost useless for the admission of light and air, by a high wall running up parallel with and within a foot or 18 inches of it. I am informed that these buildings, and the culs-de-sac adjoining, form 'houses of refuge' for many of the worst characters in London."

Of places like these, it may be affirmed that they are utterly incompatible with the maintenance of health; their unfortunate inmates are as surely, though it may be more slowly, poisoned, as if they had been shut up in the Black-hole of Calcutta. Jennings'-buildings was conspicuously distinguished by a severe outbreak of cholera in the early part of 1849; in consequence of which, in company with the Earl of Carlisle, I inspected the locality. The general results, as to preventible sickness, are thus given by Dr. *Lewis*:—

"During the last eight months, the total number of deaths have amounted, in a population of 750, to 33; of these, 20 were from cholera and diarrhoea. The entire mortality is, therefore, at the rate of 44 per thousand for that period, or 6.6 per cent., a frightful ratio."

The economical part of the question ought not to be lost sight of:—

"Jennings'-buildings, though a source of considerable profit to the owners and other speculators in such houses, are the principal cause of the high poor-rate paid by the inhabitants of other parts of the parish, and which would undoubtedly be reduced but for this and some other smaller nests of pauper houses. During the raging of the epidemic, much cleansing and limewashing was done by the authorities, and many lives were doubtless saved by that means, when the disease broke out for the second time among these houses. But the 'buildings' are gradually reverting to their original condition."

Special Evils of common Lodging-houses.—It is essential to point out that these common lodging-houses are not only, in all seasons, a cause of disease to their unhappy and neglected inmates, and of a heavy pecuniary loss to every parish where they exist; but they often prove a source of direct infection to the surrounding districts. It is well known to the parochial medical officers that they are a hotbed for fever of every kind, and often of a virulent and contagious nature. Having had occasion lately, by direction of the Board of Health, to institute some preliminary inquiries into the neglect of vaccination, and the consequent increase of small-pox, I have obtained evidence which shows that this latter disease is very frequently introduced among the permanent inhabitants of populous districts of the metropolis by unvaccinated

sojourners, and especially new comers from Ireland; who, taking up their temporary abode in these establishments, and becoming affected with the distemper, serve as so many active foci to light up this destructive and loathsome disease in the neighbouring localities. The same kind of evidence has been given me in some country towns, where it is found that small-pox is frequently introduced by tramps, wandering vagrants, and other inmates of these houses. This is a question of great importance, and it is so felt to be by medical men, and by the local authorities; since, whatever care is bestowed by them to guard the permanent population—for whose health they are more particularly responsible—from the ravages of small-pox by vaccination, the object is liable to be, and in fact is, constantly defeated by the introduction of unprotected persons into dwellings so well calculated to develop zymotic disease. If the importation of small-pox by unvaccinated new comers were prevented, as by proper legislative measures it could be, it is the opinion of competent judges that the disease would be reduced to very narrow limits, if not totally extirpated, in all localities where vaccination was universally and scientifically practised.

There is at present no efficient legal power to regulate common lodging-houses in the metropolis; for although some control is given by the Nuisances Removal Act to the guardians of the poor, as to cleansing operations, the prime evil of these places, overcrowding, is left untouched. As an indication of what might with proper regulations be effected, it may be stated, that when, upon my recommendation, in the month of March, 1849, the guardians of St. George's, Southwark, enforced in the lodging-houses in the Mint the imperfect sanitary precautions as to cleansing, &c., authorised by the above Act, so beneficial a change was wrought in them, that when cholera subsequently raged in the parish, in which no less than 112 deaths occurred in one week, so few cases took place among the numerous inmates of those crowded dwellings, as to excite the surprise of Mr. Rendle, the surgeon of the district.

MARYLEBONE.—*Inhabited Cellars.*—In connexion with the subject matter of the present section of my Report, a passing notice may be given to a class of dwellings the existence of which is probably known to few beyond their unhappy inmates and the officials whose duties call them to these places. I allude to the inhabited cellars of Marylebone. Owing to the increasing and urgent demand for house accommodation for the poor in every quarter of the metropolis, it has become the practice, in many decent and respectable streets in this parish, for the occupier to let off to separate families the under-ground kitchens, which, it must be understood, were originally never contemplated, as assuredly they are unfit, for human habitation. According to the medical evidence, "there is a large underground kitchen population." I have myself examined some of these kitchens, as they are termed; and I am bound to say, that in construction and wretchedness they are more objectionable as dwellings than many of the cellars of Liverpool and Manchester, the use of which has been prohibited by the authorities of those towns. The following is an accurate description of one in Devonshire-street, Lisson-grove:—The depth below the level of the street, upwards of 6 feet; length, 9 feet 6 inches; width, 9 feet 3 inches; height, 5 feet 6 inches; one window, 3 feet 3 inches by 2 feet

5 inches; rent, 1s. 6d. In the small sunken area there was a drain, from which proceeded the foulest stench I think I have ever smelt; close to this drain was a water-butt, the contents of which must of necessity have become tainted by absorbing the noxious gases emitted.

In a very small sunk court behind, were a foul privy and heaps of refuse. In this kitchen, which in the broad daylight was so dark and gloomy that it looked like a cell, lived a man and his wife and five children; so that, as the cubic space equalled about 580 feet, the allowance to each person was about 83 cubic feet, or one-sixth of that which, at the lowest estimate for sleeping-rooms, is compatible with health. One of the children was ill from inflammation of the chest, the others looked sickly, whilst the mother of this unhappy family had been removed to the workhouse labouring under phthisis or consumption—a disease which depends more frequently on breathing a foul atmosphere than on any other one cause. With the light thus excluded, the air tainted, and the water poisoned, the vital forces are so reduced, that when any disease arises medicine loses its power. The children especially suffer from being more constantly immersed in the foul atmosphere, and from their powers of resistance being less; the pale lips of these poor sufferers has attracted the attention of the medical attendants.

Mr. Palmer, the late resident surgeon of the Western General Dispensary, says—

"He has a horror of these kitchens, in which disease prevails very much, especially among children; and when illness does occur, it is most difficult to treat."

Mr. Hetty, a medical officer of Marylebone parish, states—

"He has seen a back kitchen with the beds so close, that there was scarcely room to walk; the windows are below the level, and small. There is much sickness; it is hopeless to treat any severe case in a kitchen; it is of no service to give medicine in fever and diarrhoea, they always go from bad to worse."

The putrid atmosphere gives a virulence to disease unknown in more healthy localities. Thus, during the epidemic scarlet fever in this district of 1848, Mr. Palmer says he saw in the worst cases in these cellars what he had never witnessed but once before:—

"Mortification and sloughing of the skin covering the throat, sometimes extending almost from ear to ear. Saw as many as two or three dozen of such cases. Knows nothing of which he is more certain, than that they were caused by foul air and bad ventilation; in some of these instances there was no want of food."

In corroboration of this assertion, this gentleman states there is such a vast difference in the same house between these cellar-kitchens and the rooms above them, that he has seen a most marked effect produced by merely removing a sick child into the garret:—

"He has again and again seen a striking improvement, the only change being from a dark and close to a light and more airy apartment, all other circumstances remaining the same."

During the late epidemic, Mr. Buxton, the present house-surgeon of the Western General Dispensary, states that the inhabitants of these

kitchens suffered severely. There are similar underground dwellings in other parts of London, and, the causes being the same, the results correspond. Dr. Lewis thus notices the cellar dwellings of Kensington:—

“One great evil is the number of people lodging in underground rooms; in these rooms zymotic diseases of all kinds, especially small-pox, typhus, and measles, are invariably more fatal than in other parts of the same house. The lower the room, the more severe the disease: thus, any of these maladies is found to be more dangerous when occurring to a person living in the basement story, than to one inhabiting the ground floor; more so on the first floor than on the second floor, and so on.”

From this evidence, it is certain that a large annual sacrifice of human life is directly caused by these underground cellars; of which, according to Mr. Hetty, there are hundreds in Marylebone, and which call as loudly for efficient regulation or closure as those of Liverpool, where the local Act gives ample powers for this purpose.

There is a strong desire in various parishes to introduce sanitary improvements, but it too often happens either that the advocates of such ameliorations are in a minority, or that where more unanimity prevails, the present state of the law renders all effectual amendment impracticable. As an indication of these impediments, it may be stated, that in 1847 the guardians of Clerkenwell appointed a committee—

“To view and report upon the condition of such buildings, in the courts and other places in the parish, as might appear to be in a dangerous state, and also to call the district surveyor's attention thereto; and to take such other measures as the committee might deem advisable for the public safety, or for abating any nuisances that might be found to exist in the localities referred to.”

Mr. Liddle states that the Report contains a faithful account of the deplorable condition of the poor localities; and that although many of the evils do not at this moment exist, nuisances of a frightful kind still abound in the parish, among the chief of which may be mentioned Fleet-ditch, which is uncovered for a considerable extent, and the noxious trades carried on in its vicinity. The houses, which in 1847 were reputed to be wholly unfit for habitation, still remain; although “the donkeys,” which inhabited the lower parts of the dwellings and shared the apartments with the inmates, have been removed. The following extract, from the Report of the committee, points to the defective state of the law, which thus, on the approach of a destructive epidemic, prevented the application of those measures which they deemed to be essential to the public safety:—

“Your committee also feel it incumbent upon them to draw attention to the fact, that unless some legislative measure be passed for the removal of the confined, damp, and unhealthy courts and alleys hereinbefore referred to, they will, doubtless, long continue to remain pest-houses, spreading disease among the surrounding neighbours; as, on inquiry, it appears that no law at present exists, which would prevent the rebuilding of such courts and alleys by the owners thereof in consequence of dilapidation, &c.; and while the law prohibits the building of such places in localities where they do not already exist, it appears to be inoperative as regards the places built before the passing of the Metropolitan Buildings Act, however unhealthy the locality may be, arising from its confined situation, and that absence of all means of ventilation and drainage.”

Progress of Cholera in the Barracks of the Metropolis.—The following Return, received from the Adjutant-General's Office, shows the progress of cholera as far as the troops quartered in the metropolis are concerned:—

RETURN of the Number of Soldiers in each of the Metropolitan Barracks at the time of the prevalence of Epidemic Cholera in the Metropolis last year; and the number of cases of Choleraic Diarrhœa in each Barrack; also of developed Cholera, and of Death from Cholera.

Regiments and Battalions.	Number of Soldiers in each Corps.	Number of Cases of		Number of Deaths.
		Diarrhœa.	Cholera.	
1st Life Guards, Hyde-park Barracks	404	None.	None.	None.
2nd Life Guards, Regent's-park Barracks	385	150	8	4
Royal Horse Guards, Hyde-park Barracks	342	22	12	6
Grenadier Guards:—				
1st Battalion, Portman-square and St. George's Barracks	602	77	3	2
2nd Battalion, Wellington Barracks	478	43	2	2
3rd ditto ditto	536	19	..	..
Coldstream Guards:—				
1st Battalion, St. George's and St. John's Wood Barracks	618	37	4	2
2nd Battalion, the Tower	502	43	6	5
Scots Fusilier Guards:—				
1st Battalion, St. John's Wood and Portman-street Barracks	483	24	7	1
2nd Battalion, the Tower	523	50	27	5
Total	4873	465	69	27

(Signed) JOHN MACDONALD, A.-G.

I am indebted for the following facts to Mr. Gulliver, surgeon of the Royal Horse Guards. The 1st Life Guards left Hyde-park barracks for Windsor on July 1st, 1849, a time when the epidemic was just beginning to acquire force in London. On that day the Royal Horse Guards succeeded the above regiment at Hyde-park barracks, and on July 4th a fatal case of cholera occurred. The regiment was generally healthy till September 1st, when a case appeared in an airy room on the park side of the barracks. The disease increased quickly on this airy side of the barracks up to September 10th, when, on Mr. Gulliver's recommendation, the regiment marched to Canterbury. The beneficial effect of this procedure was most marked; for whilst on the very day on which the troops marched, two cases occurred in the wives of two of the soldiers, who had been left behind, with the intention of following on the next day, and who were living in the part of the barracks above noticed, only one case of cholera took place subsequent to the removal, and this man, who had carried the germs of the disease with him, recovered.

It will be seen that the Horse Guards, being quartered in a district

in which several attacks of the epidemic occurred, suffered most severely, having lost nearly two per cent., there being 6 deaths out of 342 soldiers. The next in severity is the 2nd Life Guards, the mortality being rather more than one per cent.; and then the regiments of the Foot Guards quartered in the Tower, in which the deaths are rather less than one per cent., or 10 out of 1025. The total deaths among the 4873 troops are 27, or 5.5 in 1000; a proportion somewhat less than that of the whole metropolis, which is 6.6 deaths in 1000 inhabitants.

PRISONS OF THE METROPOLIS.—Taking the prisons of London collectively, the mortality from cholera exceeded that of the inhabitants generally, as will appear from the following statement:—

	Average Number of Prisoners.	Attacks of Cholera.	Deaths.
1. House of Correction, Coldbath-fields*	1,100	0	0
2. Model Prison, Pentonville	465	0	0
3. Giltspur-street Prison	247	0	0
4. Bridewell	90	0	0
5. Newgate	200	1	0
6. Horsemonger-lane Prison	228	1	1
7. House of Detention†	122	1	0
8. House of Correction, Westminster	800	42	13
9. Millbank Penitentiary	1,106	113	48
Total	4,358	158	62

The percentage of deaths to the whole number of prisoners is 1.4, whilst the proportion of deaths among the population generally is 1 in 151. As might probably have been expected from their low situation on the banks of the Thames, the Westminster House of Correction and the Penitentiary, Millbank, have principally suffered; in the former the mortality being 1.6 per cent., whilst in the latter it rises to 4.3 per cent. of the prisoners. If these two prisons be excepted, the mortality is extremely slight, there being only one death out of 2330 prisoners. A difference thus striking demands some inquiry into the probable causes that have led to it.

Millbank Prison.—It is well known that a considerable amount of sickness has in former years from time to time occurred among the prisoners; and it is important to observe, as indicative of the operation of some general cause or causes, that fever has prevailed. In reference to this subject, the Medical Superintendent, Dr. Baly, remarks,—

“The causes of the general liability of the prisoners to fever appear to be the low site of the prison, the proximity of low and ill-drained ground, open sewers and manufactories which fill the air with impurities; the construction of the building, which impedes the free circulation of air through

* One prisoner died here from cholera, but it evidently was an imported case, the man having been brought from a place where the disease prevailed, and being attacked on the night of his admission.

† Two imported cases occurred at this prison.

it, and the proneness to suffer from general causes of disease, which is produced by the state of imprisonment.”*

Previous to the appearance of cholera in England, there had been a great increase of disease generally, but especially of fever, among the male prisoners, the number of whom had also been considerably augmented, as appears from the following table:—

TABLE showing increase of Prisoners, Disease, and Mortality.

	1844.	1845.	1846.	1847.	15 Months ending 31st March, 1849.
Average Number of Male Prisoners	742.434	828.041	845.321	983.076	1207.146
Cases of Fever { Severe	17	17	21	65	117
{ Slight	24	18	42	51	231
Deaths from Fever	3	4	3	7	18
Total Number of Deaths from all causes	13	14	12	28	93

In reference to this increase of fever, after making allowance for the fact that fever was epidemic in London in 1847 and 1848, and for the causes above enumerated, connected with the site of the prison, &c., Dr. Baly remarks that the circumstances of the case would suggest the suspicion

“That in the summer and autumn of 1848 some special cause existed in the prison favourable to the spread of the disease there; and other facts seem to show that this cause was the increase of the number of prisoners in the establishment, and especially the accumulation of too large a number of prisoners in the large common rooms or wards of the prison.”

In corroboration of this inference a table is given, from which it appears that the number of prisoners, which had been on the average, for the first four months of 1848, 1081, was increased in May to 1364; that the average continued high (1350) until December, when it fell to 1031; and that, in the same way, the number of cases of fever, especially the severe and fatal cases, increased in June, and continued high till the end of December, when they greatly diminished. But more than this, when an inquiry was made as to the parts of the prison in which the greatest number of cases of fever occurred, it appeared—

“That the proportion of cases in the rooms where prisoners, on account of the crowded state of the prison, had been congregated in large numbers, was 26.75 per cent. during the seven months (May to November); and in the rest of the prison, where the prisoners were with few exceptions in separate cells, only 12.81 per cent. The proportion of deaths was also proportionably greater in the parts of the prison in which the prisoners were congregated in larger numbers.”

After stating that the number of prisoners was in consequence of these facts reduced, and that this was accompanied by a marked diminution in the attacks of fever, Dr. Baly observes—

* Millbank Prison, Sixth Report of the Inspectors, p. 6.

"There is every reason to believe, therefore, that the number of prisoners in the rooms and wards referred to had exceeded the limit which is compatible with the health of the prisoners; and that the continued and increasing prevalence of fever in the summer and autumn of 1848 was due to this cause."*

It cannot, I conceive, be doubted that the crowded state of this prison, by lowering the powers of the system, tended to increase the attacks of cholera. But the other circumstances mentioned by Dr. Baly must have had a large share in producing the mortality, since it appears, from information furnished to me, that in the former epidemics of cholera the prison suffered severely.

	1832.	1833.	1834.
Number of Prisoners . . .	519	581	637
Deaths from Cholera . . .	17	5	9

The total deaths were thus 31, or 1·7 per cent. of the total prisoners. The influence of overcrowding in connection with the spread of fever is most strikingly illustrated by the facts above detailed.

Note.—Since the above was written, I have had an opportunity of examining the Report of the Inspectors of Millbank Prison for the present year, 1850. In this document some very important evidence is given by Dr. Baly confirmatory of the correctness of the opinion that overcrowding, which it must always be borne in mind is the result not merely of an excess of numbers, but also of defective ventilation, was the most essential cause of the large mortality from cholera; indeed I do not know an instance affording more demonstrative proof of the truth of the position advanced in the fifth section of the present Report, that "of all the causes which predispose to preventible disease, the most influential and deleterious is overcrowding." After alluding to the influence of numbers and defective ventilation on the spread of cholera in the prison, Dr. Baly observes,—

"The following facts, which tend to show that the proportional number of cases of cholera was greatly diminished, by reducing the number of prisoners in the establishment, have, consequently, an important bearing on the question of the cause of its prevalence in the prison.

"In the month of July, when the epidemic was becoming general and severe, it was deemed advisable to reduce the number of prisoners at Millbank, and on the 21st of that month a large body of male convicts were removed to Shorncliff barracks; and in the latter part of August a further number was removed. Those who remained were distributed through the five different pentagons ordinarily occupied by male prisoners. The number of female convicts in the female pentagon remained the same as before. The comparative prevalence of cholera, and the mortality from it, amongst the male and female convicts respectively, before and after the reduction in the number of the former class of prisoners, are shown in the subjoined table, together with the mortality at the same periods in London:—

* *L. c.*, p. 6.

	June and July.	Aug. and Sept.
Number of deaths from Cholera in London . . .	2189	10,896
Mortality per 1000 of population in London . . .	0·9	4·5
Number of female convicts in Millbank Prison . . .	120	131
Mortality per 1000 from Cholera amongst the female convicts	8·3	63·4
Cases per 1000 amongst the female convicts	16·6	61·0
Number of male convicts in Millbank Prison . . .	1039	402
Mortality per 1000 from Cholera amongst the male convicts	23·1	9·9
Cases per 1000 amongst the male convicts	53·9	37·3

"It will be seen that while in the metropolis generally the mortality from cholera was five-fold greater in August and September than in June and July, and while an equal increase took place in the mortality amongst the female convicts in the Millbank prison, the mortality and the number of cases of the disease among the male convicts underwent an extraordinary diminution; and it cannot but be admitted as at least highly probable, that this favourable alteration was the result of the diminished number of the male prisoners in the parts of the establishment occupied by them."

A marked benefit was also produced by the reduction as regarded fever, so that

"the cases of fever, and the number of deaths from the disease, became even proportionally less numerous from the time of the reduction in the number of the prisoners at the end of November, 1848; and no cases of a severe character, except three imported cases from Ipswich, occurred during the months of August, September, October, and November, 1849, when the number of prisoners was reduced so low by the removal of a large portion of them to Shorncliff."

House of Correction, Westminster.—This prison suffered most severely after the Millbank Penitentiary, the deaths amounting to 13 in 800 prisoners, 1·6 per cent., or more than double the mortality of the metropolis. From a statement for which I am indebted to J. Lavies, Esq., the medical attendant, it is shown that in the six years 1844-49 there were 10 deaths from fever, or, assuming the average of the prisoners to be 800, 1·2 per cent. for the whole period. In the same time the deaths from all causes amounted to 68, 8·5 per cent. for the six years, or 1·3 per cent. annually. In addition to the attacks of cholera, there was a large amount of diarrhoea, the cases being 471, all of which were successfully treated. Mr. Lavies remarks that the men suffered much more severely than the women; that in them there was no premonitory diarrhoea; that the dissipated, the destitute, and the drunkard were not the victims; the attacks occurring among persons in previous good health and of robust habit; and that several cases arose in one particular part of the building, the only discoverable cause for which was an open sewer on the outside of the prison. He adds—

"The sewer, upon my representation, in conjunction with Captain Williams, the Inspector of Prisons, was immediately covered in; and since the whole of our drainage is undergoing general revision and repair."

House of Correction, Coldbath-fields.—The facts connected with

this prison are very interesting. It lies towards the north of the metropolis, and has the advantage of being on somewhat elevated ground; but the neighbourhood around is a very unhealthy one, as the prison is within a quarter of a mile of Saffron-hill and the courts in Gray's-inn-lane, where there were many deaths from cholera; it is also close to Spafields burial-ground. In this gaol, with 1100 prisoners, not a single case of cholera arose within the walls; nor was there much diarrhœa, and the cases that occurred were not severe and were easily checked. But in the epidemic of 1832-33, with about the same number of prisoners (in 1832 the number was 1148), the results were very different, as will appear from the following table:—

	Confirmed cases of Cholera.	Premonitory and Incipient Cases.	Total Number of both.	Total Number of Deaths.	Total Number Cured.
Male cases of Cholera in 1832 .	145	282	427	32	
Female " " .	56	19	75	11	
Male " 1833 .	6	18	24	2	
Female " " .	..	..	..	..
Total . . .	207	319	526	45	481

In 1832, according to information for which I am principally indebted to Mr. Chesterton, the governor, and to Mr. Wakefield, the surgeon of the prison, the drains were in a very defective state; so that, on examination, it was found that the sewers had in places fallen in; they were dry-built, without mortar, and consequently contained a quantity of soil. There were at that time water-closets, but the pans were made of iron, instead of earthenware as at present; and, owing to the defect of the drains, the contents were not carried off. Subsequently the whole of the sewerage was rebuilt on an improved principle, and, on being lately examined, was found to be in excellent order, great attention being paid to the subject. The diet of the prisoners is also better now than it was in 1832; and a small open fire has been placed in each of the day-rooms, which, in Mr. Chesterton's opinion, has operated beneficially, by preventing cold and dampness, at the same time that ventilation is promoted.

The officers at the prison informed me that since the above ameliorations the health of the prisoners is much improved, that the general mortality is diminished, and that fever is less severe than formerly. The returns with which I have been furnished corroborate, as far as they extend, the above statements; thus the annual average of deaths for the 6 years 1844-49 was only 9 with an average of 1000 prisoners, whilst in the 6 years 1826-31 the yearly average of deaths was 15. In the 6 years 1844-49 the deaths from fever were 5 in an average of 1035 prisoners, or a half per cent. for the whole time; whilst the total deaths in the same period amounted to 56, or 5.4 per cent.

Giltspur-street Prison and Newgate.—These prisons, situated in the very heart of the metropolis, and at no great distance from a district which suffered severely, experienced, the former a complete and the latter all but a complete exemption. This is the more striking,

since the inmates of these prisons, differing in this respect from those of the Houses of Correction, must have been more frequently renewed or taken out of the main mass of the population.

Bridewell Prison.—This prison presents an instructive example of the great benefits resulting from the application of judicious sanitary measures. It should be recollected that Bridewell is situated in a locality which suffered most severely in the late epidemic, so much so indeed as to have attracted public notice. The following particulars are taken from a report of Mr. H. C. Edwards:—

“Mr. Holme Coote, Assistant Surgeon to the prison, states, that the average number of prisoners during the years 1848 and 1849 was 90; that during the whole period very little sickness of any kind existed; and that, whilst the cholera raged on all sides of the prison in houses closely contiguous, only separated by a narrow court, not a single case of cholera occurred; this was the more remarkable as fresh prisoners were daily brought in, of the lowest class and in the greatest state of destitution and filth. Only one person (a turnkey) was attacked with diarrhœa (which easily succumbed to treatment), occasioned, in the opinion of Mr. Coote, by the party having been placed near a foul drain which was being cleansed. In the epidemic of 1832, 12 persons were attacked and 4 died, and there was at that time and previous thereto a considerable amount of sickness. This remarkable exemption from cholera, of the Bridewell, Mr. Coote and the Governor attribute to the very different sanitary arrangements of the prison. In 1832 the prison was in a most filthy state; the dirt on the walls, instead of being washed off, was merely covered with a coating of lime-wash, so that when a thorough purification *did take place* the walls were found coated to the depth of two inches. In 1832 three prisoners occupied a cell, there was a deficiency of medical superintendence, and neither personal cleanliness nor proper ventilation was sufficiently attended to. To these causes was attributed the mortality, and the medical inspector, Mr. Nicholl, is stated to have said ‘that he should have been surprised if the prison had escaped.’ So dissatisfied were the authorities with the then arrangements, that the whole of the staff of officers were dismissed.

“Since that period, however, a vast alteration has taken place. The prison is kept beautifully clean, personal cleanliness is strictly enforced, only one inmate is allowed in a cell, proper and wholesome food is supplied, and the prisoners are under rigid medical superintendence. A more striking instance of the beneficial effects of proper sanitary arrangements Mr. Coote is of opinion could not be found. On examining the medical books of the prison, it was remarkable how very little any of the inmates seem to have suffered from sickness of any kind. Some few cases of fever appeared about two years ago, but these arose in persons who were affected before entering the prison.”

Model Prison, Pentonville.—This prison having been constructed specially on sanitary principles, the statistics of disease assume, as in the case of the model lodging-houses, a greater interest. It has been seen that, with an average of 465 prisoners, no death occurred from the epidemic. But further, it will appear from the following statement, for which I am indebted to C. Bradley, Esq., the resident surgeon, that, as regards those diseases which serve as an unerring standard to test the healthiness or unhealthiness of a locality or establishment, the Model Prison is most favourably distinguished. Taking a period of 7 years, that is, from the opening of the prison to December 31, 1849, the following are the results:—

Model Prison.

Average number of prisoners	395
Total cases of fever for the 7 years	9
Dysentery	0
Diarrhœa	2
Erysipelas	0
Smallpox	1
Deaths from the above diseases (fever)	1
Total deaths from all causes in the 7 years	20

It is necessary to explain that the return only includes the severe cases of diarrhœa, "slighter cases of relaxation of the bowels, requiring an astringent dose or chalk mixture," and which are not unfrequent, being omitted. Further, it should be stated that prisoners labouring under diseases which endanger life, and not likely to recover in the prison, receive pardons, a circumstance which will of course affect the mortality; in the above period, for instance, two men suffering from diarrhœa were discharged, one of whom would probably have died. No pardons on medical grounds were granted in the seven years for fever, dysentery, or erysipelas. After making the necessary allowance on this ground, which will have little influence on the zymotic class of diseases, the results are most marked, and, as in every instance without an exception that has come to my knowledge, demonstrate the supreme importance of sanitary principles.

Lunatic Asylums.—There are in the Metropolitan District, which includes a distance of about seven miles, about forty-six licensed asylums, in which, on January 1, 1849, the numbers were as follows:—

Men	1363
Women	1774
Total	3137

This is exclusive of the public establishments, such as Bethlem and Hanwell. The Commissioners in Lunacy have obtained returns from all the establishments in which cholera occurred; the results of which, as to numbers, are shown in the table at page 71.

These returns, including 2570 lunatics out of 3137, thus show that there have been more or less severe attacks of cholera in most of the larger private establishments, and that the mortality has been very high as compared with the metropolis, the percentage of deaths to the total inmates ranging from 1·8 to 13·6, the average being 6·4. In comparing these asylums—all of which (excepting that of St. Marylebone, which has only paupers) receive private and pauper patients—with each other, it will be found that the relative mortality corresponds to a considerable extent with the relative mortality of the several districts of the metropolis: thus Bethnal-green and Camberwell districts, containing the asylums of Bethnal-green, Peckham House, and Camberwell, which suffered the most, stand considerably higher in the mortality table (see p. 40) than Marylebone and St. Luke's, where are situate the asylums of the same name. The largest establishments, including Grove Hall, Bow, where dysentery was so fatal, have on the whole suffered more severely than the smaller ones, with the marked exception of Althorpe House. It appears from the returns, that in all instances increased attention had been paid to the drainage, flushing,

	Lunatics.			Cholera.				Percentage of Deaths of Total Inmates.		Diarrhœa.			Dysentery.		
	Male.	Female.	Total.	Attacks.		Deaths.		Recoveries.		Attacks.	Deaths.	Recoveries.	Attacks.	Deaths.	Recoveries.
				Male.	Female.	Male.	Female.	Male.	Female.						
1. St. Luke's.	92	123	215	4	6	3	1	1	5	1·8	67	2	67	27	92
2. Grove Hall, Bow*	144	263	407	4	22	3	8	1	14	2·7	88	2	86	2	86
3. Hoxton House	160	259	419	7	33	3	18	4	15	5·	21	2	21	2	21
4. St. Marylebone Asylum.	26	47	73	4	..	4	..	..	..	5·	2	..	2	..	2
5. Camberwell House	133	195	328	11	12	10	8	1	4	5·4	14	4	10	10	10
6. Cowper House, Old Brompton.	..	..	33	4	..	3	..	1	..	9·	..	..	..	..	..
7. Peckham House	184	282	466	34	56	19	24	15	32	9·2	140	6	134	6	134
8. Bethnal-green	267	318	585	20	42	18	38	2	4	9·5	..	..	..	..	..
9. Althorpe House, Battersea	16	28	44	3	5	3	3	..	2	13·6	10	1	9	1	9
Total	1,022	1,515	2,570	91	176	66	100	25	76	6·4	342	13	329	27	92

* In the return from this establishment it is stated, in reference to the large mortality from dysentery, that most of the fatal cases occurred in old, debilitated, and paralytic patients.

and the removal of refuse, &c. The diet was, in almost every case, likewise improved.

Public Asylums.—Bethlem Hospital.—This is a public lunatic asylum, situated in the parish of St. George the Martyr, but on the verge of Lambeth parish. It contains, on an average, about 200 men and 200 women. According to a statement with which I have been favoured by Dr. Wood, the resident medical officer, not a single case of cholera occurred among the inmates during the late epidemic. In the end of July, 1849, there was a rather severe attack of diarrhœa, but no case was fatal. This hospital experienced a similar exemption in 1832. Cholera prevailed extensively around the institution, and within a stone's throw several severe outbreaks of the disease occurred—a circumstance which makes the exemption more remarkable. The establishment is surrounded by a large open space; there are no privies nor cesspools; the water is supplied exclusively from a deep well on the premises; and to this Dr. Wood is inclined to attribute importance. The diet was not altered during the epidemic. There is very little low fever among the patients.

In connection with this institution the following interesting facts were communicated to me. Some years ago a particular gallery attracted the attention of the authorities, in consequence of the inmates suffering from fever and diarrhœa. This was the more unexpected, because the gallery was one of the most favourably situated in the whole establishment; it was lofty, very airy, and not at all crowded, and the patients were of the healthiest class. Upon examination it was ascertained, that owing to some defect in the water-closet, a leakage of the soil had taken place beneath the floor. This was corrected; the sickness ceased, and this gallery has ever since continued as healthy as any part of the institution.

Middlesex County Asylum, Hanwell.—This fine institution is situated in the open country, about seven miles from London. The average number of patients during 1849 was as follows:—

Males	408
Females	553
Total	961

According to a letter received from one of the resident medical officers, Dr. Hitchman, not a single case of cholera occurred, either among the inmates or among the numerous attendants. But the epidemic gave unmistakable evidence of its influence; 140 females having suffered from diarrhœa during the months of July, August, and September, all of whom speedily recovered by taking each a small quantity of brandy with twenty minims of Battley's sedative solution of opium. The epidemic nature of the affection was indicated, particularly in one instance, in which, on the night of August 5th, seventeen female patients and one nurse, all belonging to one ward, were attacked with diarrhœa, attended in some of the cases by great exhaustion. The male patients were very slightly affected, only six patients and two attendants having been attacked in the above period. Dr. Hitchman adds, that on the female side of the institution, of which he is the medical attendant, no case of fever has occurred since his appointment

(four years), and that he finds no record of any attack for a much longer period.

Remarks.—It is remarkable that whilst so many private asylums have suffered, and some seriously, from the epidemic, the two large public institutions of Bethlem and Hanwell, containing together 1361 patients, besides attendants, entirely escaped. It is not from this to be inferred that the attack in the one instance, and the exemption in the other, have been owing to the private or public character of the establishments; several of the private asylums in the metropolis having escaped, whilst public institutions elsewhere have suffered. A very fatal outbreak occurred for instance at the West-Riding Pauper Lunatic Asylum, Wakefield, as the following facts extracted from the Reports of the medical officers to the visiting magistrates will show:—

	Number of Patients.	Diarrhœa.		Dysentery.		Cholera.			Remaining Cases.
		Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Recoveries.	
Males	296	41	0	6	5	63	49	6	8
Females	324	83	0	7	1	55	36	6	13
Total	620	124	0	13	6	118	85	12	21

The above table relates to the month of October, 1849; it appears that one other death occurred from cholera, making the total deaths from the attack 86.

I was myself a witness of a severe outbreak of cholera in a large public asylum at Glasgow.

Without making special investigation into the exact state of each establishment, it is impossible to offer any definite opinion respecting the attacks in the several metropolitan asylums; but I may state that in some institutions which I did visit during the prevalence of the epidemic, offensive effluvia escaped from the closets and urinaries, a circumstance which, so far as I have observed, is most prejudicial during the presence of cholera, since diarrhœa and dysentery are particularly liable to occur among persons exposed to a privy atmosphere. In all cases in which large numbers are collected together, and especially in the case of paupers, prisoners, and lunatics, it is essential that the water-closets and urinaries should be perfectly inodorous, a condition which by proper arrangements and precautions can be secured.

Progress of Cholera in Workhouses.—The Board of Health, having, in the months of January and February, 1849, instituted a special inquiry into the sanitary state of the several workhouses of the metropolis, and into their capabilities for the reception of persons affected with cholera,* was desirous of obtaining an accurate statement of the num-

* Report on thirty-eight Metropolitan Workhouses, by Dr. Arthur Farre, and R. D. Grainger, Esq., printed by order of the House of Commons.

ber of inmates in each house who had been attacked either with cholera or diarrhoea; together with other illustrative details respecting the number of widows and orphans who had become chargeable on the rates, owing to deaths from the epidemic; the total expense thus incurred, &c. A Return was ordered to be made of these particulars by the House of Commons; but so few replies have up to the present time been received, that it is impossible to give any general statement relative to details which in so many different ways affect the public interests. In the absence of this information, and having received from the medical inspectors accounts of only a limited number of these establishments, the duties of those gentlemen relating to another object, it has not appeared to me desirable, with such imperfect data, to enter at this time upon so important a question. I may, however, remark that sufficient is known to show that where the sanitary arrangements were defective the epidemic prevailed, and in some instances very severely; and that, as regards the expenses thrown upon the ratepayers, owing especially to the large number of widows and orphans left by the victims of the disease, they will be seriously felt, and that for years to come.

Before closing this section, it may be proper to remark, that an attempt was made to ascertain the force of the epidemic among the shipping on the river, but without success; since, although a vessel was provided for the reception of sailors, many of those who were attacked were conveyed elsewhere or died on board. Many persons working on the river, such as lightermen, boatmen, ballast-getters, &c., died, most of the cases appearing in the returns from the registrars' districts which border on the Thames.

SECTION IV.

Exemptions from the Epidemic, and Results of Sanitary Improvements.

Controllable Character of Epidemics.—It is a remarkable fact that those diseases which by their destructive violence, their sudden assaults, and their wide range, seem to break through all barriers and to bid defiance to all control—which among barbarous nations are regarded as manifestations of the Divine anger, as they are, even among the most civilized people, sometimes held to be the appointed means for checking what is falsely termed an excess of population—constitute precisely the class which, when their laws are thoroughly comprehended, are found to be most observant of limitations and most amenable to human influence. The plague has yielded before the advance of western civilization; and even where, by that combination of prejudice and ignorance which in all nations so powerfully impedes the progress of the human family, it is permitted to remain, it spares the cleanly and enlightened and takes its victims out of the abodes of filth and apathy. The intermittent and remittent forms of fever, which when they operate in all their intensity may kill almost on the instant, or more slowly

with a whole population, as is seen in the Pontine marshes, have, in a multitude of instances, been eradicated by the perfecting of agriculture; whilst, as regards the typhoid or low fevers, they also select their proper habitat, and invariably diminish as sanitary improvements progress. With respect to the more specific or eruptive fevers, as scarlatina and measles, they only flourish, as to the rule, amidst the filthy and neglected dwellings of the poor, where they acquire a malignity which gives them almost a new character; while, as to small-pox, the most loathsome of the class, a perfect preventive, according to excellent authorities, has been granted to mankind in the great discovery of Jenner, though, owing to defective arrangements and prejudices, never yet realised.*

Exemptions.—In the course of the late epidemic several instances of exemptions from its attacks, partial or complete, occurred. Some of these were particularly instructive, inasmuch as they concerned large groups or classes of people, living in the midst of cities which were severely visited, and who, notwithstanding this circumstance, and that they mingled freely with the general population, were yet so fortunate as wholly or in part to escape.

Instance at Berlin.—One of the most interesting of these examples is the following, which happened at Berlin during the severe epidemic of 1848, and for the details of which I am principally indebted to Dr. Wald, one of the physicians of the splendid new hospital called the Bethanien. The authorities of Berlin gave employment, at the time in question, to a body of about 6000 men, inhabitants of the city, and of various trades and callings—artisans, mechanics, and labourers. They were employed in repairing the Charlottenburg canal, which is situated in the open country, though only a short distance outside the walls. They worked very hard, and were absent from their homes fifteen or sixteen hours daily, returning every night to sleep: they resided in all quarters of the city. It was a matter of general remark, that, whilst the general population suffered severely, of this large and mixed body of workmen, according to the most careful inquiries, only eight were attacked. Now, here were 6000 men, of diverse occupations, ages, and constitutions, who almost entirely escaped; and as their families did not enjoy any particular immunity, their exemption cannot be explained by anything peculiar in this respect. They lived better than usual; but this circumstance, although important, will not account for the very small number of attacks. The common tenor of all similar exemptions, as well as the general principles of sanitary science,

* As a proof of the lamentable neglect of vaccination it may be stated, that, having been instructed by the Board of Health to visit Windsor in November last owing to an attack of small-pox, it was discovered, in carrying out the preventive measures I recommended, that there were in a population of about 8000 so many unprotected persons that the medical officers in three weeks vaccinated 506 persons, and to these must be added those vaccinated at the Royal Dispensary and by private practitioners. And yet in this town the guardians of the poor had anxiously exerted themselves to promote vaccination, having, in addition to issuing annually placards calling on the people to send their children to the surgeon, raised the fee paid to their medical officer from 1s. 6d. to 2s. 6d. for each case. In the year 1848 the births in England amounted to 504,227; of these only 167,042, or 33 per cent., were vaccinated under the direction of the guardians; and when to this number are added those vaccinated at the expense of their parents, it is certain that large numbers must have been left unprotected.