the movements of the globe, though slightly restrained at first in an inward direction, soon became quite free.

When the case of H. J. B. presented itself, I was far from suspecting the swelling to depend on fat. It had more the appearance of œdema than of anything else, although its limited size, and the colour of the redundant skin, were different from what I had seen in any instance of simple œdema. There was no tumour to be felt; neither was there any projection within the lids in any position of the globe. Its existence in the same situation in each orbit also discouraged the idea of there being any tumour. On referring to the principal modern works, and especially to those of Lawrence and Mackenzie, I could find no account of a corresponding affection. I do not pretend to explain the reason of the remarkable projection of the adipose tissue in so symmetrical a form on the two sides, and at the same period of time. The thought suggested itself, whether it may not have depended on some enlargement of the lachrymal gland, analogous to the chronic enlargement of the tonsils, sufficient to displace and thrust outwards a fragment of the fat in which the globe is cushioned. But, had this existed, there would surely have been a perceptible swelling in the region of the gland, after the removal of the fat, and also a tendency in the gland to fall into the gap, both of which were wanting. There was no undue projection or solidity of the gland when examined through the wound during the operation.

With respect to the treatment adopted by me in this instance, I am quite of opinion that the mere removal of a portion of skin would not have sufficed. The integument would have been still pressed on by the fat beneath, and the swelling would have remained, with only a smoother and redder covering. Yet it would have been a natural course enough to have confined the operation to the skin, and not to have gone through the orbicularis; and this, in fact, I witnessed in one case.

14, Golden Square, August 28, 1849.

ON THE HEALTH OF LONDON DURING THE SIX MONTHS TERMINATING 29TH SEPT. 1849;

MORE ESPECIALLY IN REFERENCE TO CHOLERA.

By JOHN WEBSTER, M.D., F.R.S., Consulting Physician to the St. George and St. James's Dispensary, etc.

(Read before the Westminster Medical Society, Saturday, October 6, 1849.)

HAVING read a paper,¹ towards the close of last session of the Westminster Medical Society, upon the Health of London during the previous six winter and spring months, compared, especially, with the parallel months of the former season, I now propose making some general remarks, in regard to the diseases which have prevailed in the metropolis during the second and third quarters of the current year, or, in other words, the six months terminating on the 29th September, 1849.

I undertake this task the more readily, from the circumstance that London, many parts of England, and also of the Continent, have been

¹ Vide Reports of Westminster Society in this Number, for the remarks of several physicians on Dr. Webster's paper.

afflicted by the return of a most fatal epidemic, whereby many thousands have rapidly descended to an untimely grave, and from which there has followed a greater mortality than has been witnessed in Great Britain during modern times. Such being the fact, it is the imperative duty of every medical practitioner to come forward, each in his own sphere,—as, I am proud to say, the profession have done throughout the country, when so much anxiety and alarm prevailed,—in order that the causes whereby the pestilence has been produced may be explained, its direful ravages alleviated, and future visitations mitigated or prevented. Such are some of my motives for now bringing forward a few of the more prominent and instructive Vital Statistics of London, belonging to the preceding six months.

Notwithstanding the recent unhealthy condition of the metropolis, and the unusually great mortality recorded during the current autumn, throughout April, May, and June of the present year, so far from London being insalubrious, the public health exhibited rather more favourable characters than in the corresponding months of 1848, the total deaths, from all causes, having then amounted to 12,945; whereas, during the same three months of 1849, the whole mortality recorded in London, was only 12,754; being a diminution of 191 deaths, or about one and a half per cent. in favour of the recent quarter—and this, it should be remembered, although 268 victims had been carried off by Cholera, and 240 by Diarrhoea. The diminution, speaking generally, chiefly occurred in deaths from typhus and scarlatina. In deaths from typhus, the decrease was 370; and from scarlatina, 322 fewer persons died, than in the same period of 1848; however, from phthisis, pneumonia, and bronchitis, a slight augmentation in the mortality was reported. Taking, therefore, every particular into consideration, it may be said that, up to Mid summer last, the health of London was not such as to create anxiety, had there not been a reappearance of Diarrhoea and Cholera.

Statements of a very different description must, unfortunately, now be made respecting the three months which terminated on the 29th of September last. Since the great Plague, one hundred and eighty-four years ago, such an extensive mortality has never been witnessed in the metropolis as that which has occurred during the present autumn; and which, compared with the parallel three months of 1848, is astounding.

I must here express my acknowledgments to the Registrar-General for his invaluable Reports. Without their aid, it would have been almost impossible to have pursued the present investigation, since to them I am mainly indebted for the facts and figures to which reference is often made. To Mr. Farr, the profession is also under great obligations: for by his arrangement and classification of the facts supplied by the deputy-registrars, the weekly reports have been made to convey most instructive and important information, especially in reference to the prevailing epidemic.

To exhibit the marked contrast betwixt the mortuary tables of the last three months, and those referring to the same period of the former year, it may be mentioned that instead of 13,503 deaths, then recorded from all causes, the whole number, during the same quarter of the present year, was 27,159 deaths, or a fraction more than double. This enormous, and, fortunately, during modern times, unknown

mortality in the metropolis, is not owing to any augmentation in the fatality of commonly-occurring diseases, but almost exclusively to Cholera and Diarrhœa, 13,114 persons having died from the first-named malady, and 2,697 from the latter; thus making a total of 15,811 individuals who became victims to these two diseases during the period referred to in this communication.¹

History tells us of the Black Death of the middle ages. Reference is often made to the *Black Assizes*; and, in popular language, *Black Monday* is frequently mentioned. Now that the period of greatest danger seems happily to be passed, and the population likely soon to be restored to its ordinary state of health, the first seven days of September may well be called "the *Black Week* of 1849". During it, in London alone, 3,183 died, instead of 1,008, as in ordinary weeks; thus making the mortality, during the first week of the above month, three times the average, or at the rate of 454 deaths per diem, in place of 144, as in previous seasons. This increased mortality depended almost wholly upon Diarrhœa and Cholera, by which diseases 2,298 were carried off during the black week.

Notwithstanding the extraordinary augmentation of deaths during the past three months, it must be satisfactory to know, that, throughout the entire quarter, two diseases, which raged so fatally in the metropolis in the autumn of 1848, have proved much less fatal during the current year. From Scarlatina, instead of 1,560 deaths registered in London during July, August, and September, 1848, only 404 have occurred in the parallel three months of 1849, being a diminution of 1,156; Variola has also proved very mild during the whole of last summer, only 191 deaths having occurred from it throughout London since the 1st of last April, whereas 816 fatal cases were reported during the same six months of 1848, being a difference of three-fourths.

I propose—

First, to state a few data respecting the localities where the epidemic prevailed most fatally;

Secondly, to investigate the causes which apparently produced or influenced its appearance; and,

Thirdly, to consider briefly the proper measures to be employed to prevent, or, at least, to modify the violence of any future Cholera epidemic.

The symptoms, pathology, microscopic or chemical examination of the fluids and secretions, as well as the treatment of Cholera, must be left to a future occasion, and to other investigators; since, were I to enter upon these important topics, instead of a paper being adequate, a volume would scarcely suffice.

LOCALITIES IN WHICH CHOLERA PREVAILED. The worst localities were the low grounds adjoining the southern bank of the Thames. Notwithstanding the total population of this district being only about one-third of that on the northern side of the river, (or 580,000 inhabitants,) more than half the deaths by Cholera, or 6,708, out of the entire 13,114 re-

¹ Though I speak of two diseases, I do not deny that both were the results of the same epidemic influence; and perhaps modifications of the same malady.

gistered, took place in the southern division of the metropolis; which makes the amount of deaths, in proportion to the population, treble of that recorded on the northern side of the river.

Having adverted generally to the rate of mortality in the two great divisions of the capital, it now becomes interesting to notice the difference observed in several of the districts situated south of the Thames, as well for local comparison, as afterwards to contrast the amount of deaths there recorded with that met with in places lying north of the river, where a great discrepancy in the averages is often exhibited. For instance, in Lambeth parish, the deaths by Cholera were 1570 during the last six months; the ratio was therefore 1 in every 91 inhabitants. In St. George's, Southwark, where Cholera proved fatal to 811 individuals, one person died in every 64 of the population; whilst in Bermondsey, with its tan-pits, glue yards, tidal ditches, and other local nuisances, injurious to the health of the labouring population resident in that insalubrious part of London, not less than 704 persons died by Cholera, so that the very large proportion of 1 in every 56 inhabitants became victims to the pestilence. But even this excessive mortality was exceeded by the numbers registered in the parish of Rotherhithe, where 1 death from Cholera actually took place in every 38 inhabitants. Such an amount of deaths, seldom, if ever before witnessed, is most remarkable; and shows the extraordinary severity of the epidemic in that section of the metropolis.

In contrast with the great mortality met with in the southern districts, it is especially gratifying to mention one very important exception to the statements now made. Although Cholera proved exceedingly fatal, for several consecutive weeks, throughout the neighbourhood, Bethlem Hospital, with its numerous population, remained perfectly free from it, although situated in a district otherwise unhealthy, in reference to the recent epidemic. Respecting this large establishment, one or two circumstances may be briefly stated, as they seem suggestive of measures proper to be pursued elsewhere. At this Royal hospital, having a constant population of about 700 individuals, comprising upwards of 400 lunatics, besides the juvenile inmates of the house of occupations, officers, attendants, &c.; whilst there are weekly admissions and discharges of patients and others, whereby, during the last six months, perhaps 1000 persons have resided within its walls, *not a single fatal case* of Cholera has occurred during the entire year, nor indeed previously. This exemption, which I consider well worth recording, will however appear less surprising, when it is known that the ventilation of the hospital is excellent; the utmost attention is paid to cleanliness; the food is wholesome, plentiful, and regularly served; and there is a most abundant supply of pure water throughout the whole establishment, alike for baths, washing, and cooking. So copious, indeed, is the quantity, that in every water-closet, in consequence of a spring being attached to each door, whenever any person enters, the movement thus made simultaneously opens a valve, connected with a cistern, from which a torrent of water rushes into the seat; and this operation is repeated, when the patient retires. Further, through all the drains, water runs constantly; chloride of lime is also daily and freely used; and as every drain has been properly trapped, no odour ever prevails. A very deep

Artesian well—reaching to below the chalk—supplies the water required in the establishment, which a steam-engine pumps, at the rate of 70 gallons per minute, into the numerous reservoirs on the roof of the building, which are frequently cleansed, in order that the water may not be contaminated; hence, there is never any deficiency of this element, most essential in all institutions, but especially in asylums for the insane. It is, besides, proper to add that, during last spring, a common sewer, near one of the outer walls, which brought refuse from an adjoining street, was very properly covered over, lest the effluvia might prove injurious to the inmates. I have related these particulars respecting Bethlem Hospital, believing that they explain the immunity from Cholera, which this large institution has enjoyed during the epidemic.

It will be likewise interesting to state that, at another public establishment, in the management of which I also take some interest, in consequence of being under the same authorities as Bethlem, viz. Bridewell Hospital, in Blackfriars, a similar gratifying statement may be made, respecting its freedom from Cholera during the late outbreak, even although situated in one of the worst districts in the city,—having Fleet-ditch on one side, Puddle-dock on the other, and being also not far from Bride and Water lanes, where Cholera has proved specially severe; whilst there are, besides, burying-grounds near. Nevertheless, the disease has not yet appeared amongst the population, which averages about 130 persons, increased by changes to, perhaps, 200 individuals during the last six months. And this exemption has prevailed, notwithstanding that fatal cases of Cholera have recently taken place in houses almost abutting upon a prison, in which, it should be remembered, the inmates suffered from the epidemic of 1832. The recent immunity from Cholera is, doubtless, greatly owing to several circumstances of a similar kind to those mentioned in regard to Bethlem; but Bridewell, being a place of punishment, does not, of course, possess the same advantages; although the residents are well cared for, and treated according to the rules sanctioned by government for all prisons,—having substantial food, and good water. This exemption from the epidemic is the more remarkable, when we consider the class of persons to which the prisoners belong. They are committed under the vagrant act, are of all ages, and in every stage of poverty, filth, and frequently of disease; with constitutions, in many cases, shattered by debauchery, or enfeebled by destitution; but in Bridewell they are subjected to regular discipline, and are often better fed than when living at large. One important fact ought to be stated, as likely to have been instrumental in improving the salubrity of this prison; namely, that the ancient grave-yard of the hospital and precinct was closed about three years ago, by order of the committee, after having been used as a burying-ground for upwards of 250 years. This was not accomplished without expense, as the governors still pay an annual rent of 42*l.* 10*s.* to the original freeholder, besides incurring the payment of fees, &c. (from having to bury elsewhere prisoners who die in the hospital), amounting, sometimes, to 2*l.* 18*s.* per funeral.¹ However, the money is judiciously expended in abating such a nuisance; and I now allude to the closing of this grave-

¹ The following bill shows the items of extra expenses, in addition to those formerly and

yard as one instance of sanitary reform effected by a public body in the City of London, whose good example other parties would do well to imitate.

I now proceed to speak of the northern portion of the metropolis. In its population of 1,620,000, the deaths by Cholera were 6,406, or one fatal case in every 253 inhabitants. Thus, the average ranged about one-third of that in the districts south of the Thames, where one died in nearly every 86 residents. However, when more minute comparisons are made respecting particular localities, it is satisfactory to find, although the mortality by Cholera was considerable in the north-eastern part of the metropolis, it was by no means ever so high, even in the most insalubrious parishes, as in many of the southern. In Whitechapel, one death by Cholera occurred in every 156 inhabitants; in Shoreditch, one in every 134; and in Bethnal Green, which proved exceedingly unhealthy during the recent epidemic, the proportion was one death in every 120 persons resident within the parish. Again, in the City, although in the centre of an enormous surrounding population; notwithstanding, also, its Smithfield, Newgate, Leadenhall, and Billingsgate markets,—its very close crowded courts and alleys, its Fleet-ditches, Little Britains, and Alsatias,—*from its being situated, in many parts, upon a mound of gravel, having declivities in several directions, and possessing, comparatively with other places, good sewerage*, only one has died by Cholera in every 270 inhabitants; and of those who died, many lived in low, crowded neighbourhoods, such as Blackfriars and Whitefriars, and the immediate vicinity of the river.

Contrasted with the southern, north-eastern, and central parts of London, it becomes interesting now to notice the north-western districts, where Cholera has been much less fatal. Thus, in the parish of Marylebone, only one person has died in every 609 inhabitants; in St. James's, Westminster, only one death by Cholera has occurred in every 678 residents, and many of the deceased lived in crowded, confined, and often filthy habitations, such as Angel court, Peter street, and the close courts and alleys in the vicinity of Golden square. Lastly, in the parish of St. George's, Hanover square, one division of which (Hanover) is perhaps the most salubrious part of all London, only 121 persons have died by Cholera in a population of about 74,500; and it is important to add, that of these 121 deaths, 100 occurred in the lower wards adjoining Chelsea and the river, usually known as Belgravia, where nearly half the population of the entire parish reside. In addition

still incurred, which the Governors of Bridewell paid for the interment elsewhere of one prisoner, in consequence of having closed the ancient burying ground of the Precinct.

<i>To the Interment of * * * * *</i>				£	s.	d.
Ground	1	0	0			
Vicar.....	0	5	0			
Clerk.....	0	3	0			
Sexton	0	2	0			
Grave-maker.....	0	2	0			
Bell	0	7	0			
Desk Service	0	12	0			
Registering	0	1	0			
Two Bearers	0	6	0			
				£2	18	0

to these deaths, it ought to be also stated, that they do not include thirteen fatal cases of Cholera reported from St. George's Hospital, situated in the district. In contra-distinction to the mortality in the lower or Belgrave division, it is useful to know that, although several of the deaths occurred in the May Fair district, still, in the northern division, comprising the neighbourhoods of Hanover and Grosvenor squares, and hence called the Hanover district, the deaths by Cholera have been so few during the late epidemic, that not more than one person in every 1846 inhabitants has become its victim, the total number being only 13; which gives a very different result from that met with in other parts of London, but more especially in such places as Bethnal Green or Rotherhithe.

Believing that a short account of the thirteen cases which proved fatal in the northern division of St. George's parish may, in some degree, illustrate the laws regulating the appearance of the disease under discussion, I subjoin a few details regarding them. Most of the persons alluded to lived in confined streets and badly-ventilated dwellings. Seven were adults, and six were infants or children. Amongst the adults, two were butlers, one of whom had been subject to habitual diarrhoea, and had recently laboured under delirium tremens. Two were, a stableman, and a stableman's wife; the former lived in a yard subject to animal effluvia, and gases unfavourable to health, and had previously suffered from diarrhoea; the latter was poor and in want, and lately had typhus. The fifth case was a postman, living in a confined back yard; he was of an anxious disposition, and addicted to gin and bitters. The sixth was a carman, who also resided in a small, bad-smelling court. The seventh, the wife of a respectable tradesman, had hardly recovered from her confinement, which had occurred five weeks previously; one forenoon (when the epidemic was very rife) this woman purchased some bad plums, part of which she eat before dinner; afterwards, she dined upon a calf's head, and a tart made with the remainder of the plums; subsequently, she supped upon stewed beef-steak and oysters, both meals being washed down with her usual beverage. Diarrhoea and sickness came on early next morning; but, notwithstanding the severity of the symptoms, no medical practitioner was called in till near two P.M., when the disease had become so aggravated, that treatment proved inefficacious, and she died in the evening. The above history is one of the many which might be cited in proof of the danger attending such irregularities in diet, as might perhaps, in ordinary times, have produced little serious mischief. When such an epidemic of Cholera prevails, as that now leaving us, the whole population seem to be somewhat influenced by, or, at best, extremely susceptible to, its deleterious influences.

With regard to the six infants or children referred to,—one was the infant of the woman, the particulars of whose case have just been detailed: another, three weeks old, had, at the time, hydrocephalus; the third, aged eight weeks, had previously laboured under diarrhoea; whilst the fourth, four months old, had been similarly affected for five weeks: the fifth suffered from mesenteric glandular disease; and the sixth, aged ten months, had measles five weeks before, and was then also suffering from diarrhoea. All these particulars being known respecting the thirteen fatal cases met with in the Hanover district of St. George's parish—which are obtained from authentic sources—it seems surprising

that the deaths were so few, considering the irregularities of diet, the carelessness respecting hygienic measures, and the improper habits of many persons, to say nothing of the privations and destitution to which numbers in this, as in other parts of the metropolis, are unfortunately exposed. The comparatively elevated position of this part of London, its vicinity to Hyde Park, and hence freer ventilation, its generally wide streets, and open squares, the mound of gravel upon which much of the district is built, and the greater facility thus afforded for carrying off all refuse by the drains—however imperfect some of these conduits were recently reported to the Commissioners—have, doubtless, contributed to the fortunate immunity this locality has hitherto enjoyed; indeed, the local advantages now enumerated are so beneficial to the health of every inhabitant, that it is mainly owing to their absence (aggravated, of course, by the presence of other injurious influences) that the recent epidemic proved so prevalent and fatal in lower districts, devoid of similar advantages of situation.

The *sex* and *age* of the victims next merit attention.

More females than males have died of Cholera, but the difference is not great, as, in the whole 13,114 deaths, there was only about 9½ per cent. more women than men.

With regard to age, however, the peculiarity is much more striking. Upwards of half the entire number of deaths occurred in persons at the middle, or adult period of life. Speaking accurately, of the total deaths recorded from Cholera, 3,534 were under fifteen years of age, 7,565 from that period to sixty, and 2,015 beyond that age. More persons, however, died from thirty to thirty-five, or, at the prime of life, than at any other period.

CAUSES OF CHOLERA. Lest farther minute statistical details may seem tedious, I now proceed to discuss—although only in a general way—the causes apparently influencing the production of Cholera. This difficult subject cannot, however, be explained, as can some of the previous questions, either by historical or statistical references. Nevertheless, according to the views I entertain, the inquiry may be divided into four categories; namely—

1. Atmospheric. 2. Local. 3. Individual. 4, and lastly, The Exciting Causes.

Upon each of these heads, I propose to make a few cursory remarks; not expecting, of course, that, on such debateable points, the views enunciated will receive the entire acquiescence of other investigators. In case, however, any doubt should still prevail as to the opinions I entertain respecting contagion, I at once say, my views have been long decided on this question; and as the disease is now almost universally admitted to be *non-contagious*, the question is not mooted in the present paper, but left to others to discuss, should they feel inclined.¹

¹ With much deference to Dr. Webster, we beg to say that, within our own knowledge, the experience of the present epidemic has led many physicians, who previously held other views, to consider the disease, though not virulently contagious, as communicable by fomites, and also by personal intercourse, in several ways. It is also our belief, that much of the spread of Cholera in London, and throughout England, during the present epidemic, has arisen from the careless manner in which the healthy have communicated with the sick, in consequence of the anti-contagion manifesto of the Board of Health. EDITOR.

1. Respecting *Atmospheric Influences* as productive of Cholera, although chemical investigations have yet done but little towards elucidating the question, there cannot be much doubt. In the Campagna of Rome, where the worst forms of fever prevail, or in other districts of the globe in which malaria is most virulent, not much satisfactory information, as to any important chemical peculiarity in the composition of the atmosphere of these districts, has been hitherto obtained or illustrated conclusively; although not the smallest doubt exists respecting its deleterious effects, in particular seasons, upon the human constitution. Undoubtedly, experimentalists and physicians (among others, Moscati) have said, that the atmospheric air, in some malarious districts, during the existence of pernicious fevers, has occasionally a greater specific gravity than that met with in other and more salubrious situations, and is found sometimes to contain a flocculent-looking matter or substance, having, it is reported, a fungoid or animal appearance. So much, however, yet remains to be explained and established by conclusive experiments, as well as observation, that we are not yet justified in speaking with much confidence on the subject, and ought to suspend our opinion, till we obtain further information. Somewhat similar conclusions may be entertained in regard to atmospheric influences in Cholera;—we see the results, but find it difficult to explain all the phenomena.

Recently, the *ozonic theory* has occupied considerable attention. The views are certainly ingenious, and deserve further investigation. So few facts, however, have yet been brought forward to establish the deductions, that additional experiments and inquiry are necessary to support the opinions promulgated, as to the absence of ozone in the air being the negative cause of Cholera. With the view of contributing some data in regard to the influence of the atmosphere, during the recent epidemic, I would direct attention to the very peculiar weather prevalent in August last, when the Cholera proved so very virulent, compared with that observed towards the middle and end of September, at which period the disease began materially to decline. In the former month, the air felt always oppressive and ungenial; the atmosphere being generally hazy, and it looked, at times, like a thick mist. Towards the end of August, but especially in the last week, London seemed as if constantly enveloped in a dense fog, which hung over the entire metropolis, whilst the air was always unusually dry, very little rain having fallen at any time, and none during the last week. Scarcely any wind prevailed, and then it was south-west, or southerly, with diverging currents above. The thermometer exhibited, frequent and daily, very extensive fluctuations; the lowest temperature of the month being 42, the highest 82, thus making a difference of 40 degrees; but it is also important to notice (as I observed the same feature in the weather of 1832, when the Cholera prevailed so severely), that there often existed a great difference between the heat of the night and the day-time. In some nights, the temperature even ranged 30 degrees lower than in the preceding day; and throughout the entire month, the amount of electricity was particularly small, whilst the quantity of rain that fell, measured less than had been known for thirty years.

In contrast with this account of the very unusual atmospheric pheno-

mona observed in August, it is instructive to know, that during the greatest part of September, especially when the Cholera began to decline, the meteoric conditions were very different. Thus, early in the month, flashes of lightning with heavy rain supervened. On the 11th, there was a thunderstorm and hail, with a clear star-light evening, followed by deluges of rain, during the whole night. For four days afterwards, frequent squalls of wind prevailed, with occasional showers, which were accompanied by lightning and thunder on the 12th. During the third week, the atmosphere was generally clear, and often cloudless; there was much wind in the early part, mostly north or northerly, with altogether different phenomena from those observed in August. The barometer was generally high, having continued at upwards of 30 inches from the 14th to the 21st of September; whereas, during the most fatal period of the epidemic, it stood sometimes an inch less. Showers fell on the 21st, and much rain during the whole of the 23rd; the weather was stormy on the 29th, with heavy rain and electric currents; the temperature, throughout nearly the entire month, ranged much lower than in August, and there was less variation between the heat of the day and night; the difference was 26 degrees on one occasion, but latterly it was frequently considerably under that amount, and usually varied from 15 to 18 degrees. I have particularly alluded to this variation of temperature between the night and day-time, because I consider it of importance in regard to Cholera. According to my views of disease, this marked difference in the temperature not only materially influenced the accessions of attacks, but explains why so many persons, during the late epidemic, were seized in the night; as likewise the greater severity of the symptoms, and dangerous character of the malady, which then supervened. This peculiar feature in the recent epidemic, of coming on so often during the night, or early in the morning, has been repeatedly noticed by medical practitioners, although the remark applies also to other maladies. Cold nights are always most injurious to the human frame, as every one knows, especially after a high range of temperature during the previous day; not only is disease thus frequently induced, *ceteris paribus*, but the circumstance also accounts for the number of deaths which often take place towards sunrise, or early in the morning, at which period the temperature of the surrounding air often falls one or two degrees within a very short period of time; whereby the sudden coldness then produced acts with greater energy upon the system, particularly should the individual be asleep at the time, the danger being always greater under such circumstances.

2. In reference to the *Local Causes*, which have materially contributed to the dissemination of the epidemic, it appears, from the statistical data already adduced, that low, damp situations, especially those near the banks of the river, have invariably proved the most insalubrious. The vicinity of common sewers and open ditches, containing putrified materials, the neighbourhood of constantly turned-up grave-yards and of cesspools, the defective means for carrying away decaying animal and vegetable exuvæ, the absence or deficient supply of good water, the want of free ventilation of pure air, filth, overcrowding, and similar abominations, unnecessary to particularize at greater length, have all acted as efficient local causes, indubitably tending to make any place—

even though otherwise salubrious—the nidus of epidemics, whether scarlatina or typhus, but more especially Cholera. This truth is now so incontrovertibly established by most ample experience, both in London and elsewhere, and so well known to medical men, that to discuss such topics any further, seems superfluous.

In confirmation of the opinion, that low localities are peculiarly the seats of Cholera, I may mention an instructive fact, having reference to its recent outbreak in the Salpêtrière of Paris. This institution is situated near the banks of the Seine, and in rather a low situation. The population is upwards of 4,500, chiefly aged and infirm females, paupers of the department, of whom 1,300 are insane. At this very large establishment, one-third of the whole inmates died by the recent epidemic; the ratio of deaths amongst the lunatics being nearly twenty-three per cent. At Bicêtre, on the other hand, which is the great poor-house and lunatic asylum for the male paupers of Paris, having nearly 4,000 inmates, very few persons (comparatively speaking with the Salpêtrière), died by Cholera; whilst the amount of deaths, from the same cause, amongst the lunatics, was under five per cent., or less than one-fourth the proportion observed amongst the insane females. The chief reasons of the above discrepancy seem to be sufficiently obvious. The Bicêtre is situated on high and dry ground, a few miles distant from the Seine, overlooking the capital, and so constructed, that the winds of heaven blow freely through the numerous courts, and round the buildings; whilst it is likewise free from several noxious agencies elsewhere prevalent.

3. *Individual Causes* next engage our attention. In this part of the inquiry, I shall likewise be very brief, presuming that there cannot be much difference of opinion amongst medical practitioners, in regard to most of the points to which I may allude. Amongst the causes comprised in this category, must be indubitably classed dissipated habits, broken-down and debilitated constitutions, previous disease, personal uncleanness, deficient nourishment, neglect of premonitory symptoms, deranged or defective general health, misery and destitution,—in short, whatever impairs the physical strength or moral energies of an individual.

4. Among the *Exciting Causes* I would enumerate bad water, decaying or putrid food; unripe, raw, or decomposing vegetables; salted provisions of bad quality; intoxication and dissipation; exposure to the night-air in insalubrious localities, especially if asleep; great bodily fatigue; strong purgative medicines; fright; all mental emotions of a depressing character; and those influences which suddenly depress the nervous system, and debilitate the corporeal frame.

I have now succinctly enumerated some of the causes, which mainly, in my opinion, contributed to the recent spread of Cholera. Undoubtedly, by many, its appearance has been ascribed more positively to certain special influences. Thus, some have considered that the epidemic was chiefly owing to the absence of ozone from the air. Several have attributed it to a particular condition of the air, not yet described satisfactorily; others, to the presence of animalculæ, or fungi, in the water, the secretions, or in the atmosphere. Bad water, bone-houses, grave-yards, cesspools, open sewers, drains loaded with foetid matter, and similar

abominations, have respectively been considered as the paramount, if not the exclusive causes of the epidemic. Lastly, a few authorities still maintain that contagion is the principal agent.

Respecting the origin of epidemic diseases, many deduce conclusions from a too contracted view of the questions at issue, and of the facts involved. Influences, or agents, which separately have only a slight effect upon the system, often, when combined, prove active causes in producing disease. Here, we may advantageously take a hint from the curious results met with in the physical world, and which the investigations of chemists have so often demonstrated. Elements may produce little or no action upon the human frame; but the same bodies, if combined in a certain form, may prove extremely deleterious. For instance, when carbon, hydrogen, or nitrogen, are applied separately to a living animal, each seems inert, or, at least, produces very little effect; but they may combine, in definite proportions, according to chemical laws, to form prussic acid, which operates as a most violent poison. Such examples of the action of bodies composed of elements separately almost inactive, but, conjoined, most powerful, demonstrate how careful medical men ought to be, in ascribing diseased action to special agents or influences.

Speaking generally, I consider Cholera to be amenable to somewhat similar laws to those which regulate the accession of pernicious intermittent fevers in certain districts and during particular seasons. There is usually a combination of influences causing the disease; and, although it has now been attempted to point out some of the most efficient causes producing Cholera, much yet remains to be ascertained, so as fully to explain the various phenomena.

PREVENTIVE MEASURES. As the epidemic has not yet altogether ceased, and may again recur, I now proceed to make a few remarks upon the means most likely to prevent, or modify the virulence of, subsequent epidemics.

First, then, I would most decidedly say, *intramural interments must be interdicted* throughout the kingdom. Drainage must be extended in densely-peopled neighbourhoods. Slaughter-houses must be removed from the crowded haunts of men; and public markets properly regulated, frequently cleansed, and, wherever practicable, placed in open, airy situations. Common sewers must be scientifically constructed, so as not to act as the conduits of disease. The Thames must no longer continue to be the "cloaca maxima" of London, especially as its filthy contents, by quadruple diurnal agitation, are rendered in a higher degree noxious to the neighbouring inhabitants, and to the many thousand persons, who daily use the river as a metropolitan thoroughfare.

Habitations in low, damp, and confined localities should be avoided, or made more salubrious by artificial means. The physical well-being of the population, especially the poor and labouring portion, must be improved. The light of the sun, and the admission of pure air into every dwelling, ought not to be taxed or impeded, but in every manner promoted, especially by a Government endeavouring to improve the public health. As the Imperial Legislature has sanctioned the importation of all kinds of food into the country without any duty, in order to increase

the sustenance of the community, so ought it to permit the untaxed entrance of light and pure air, both being as indispensable as corn and mutton to the healthful maintenance of animal life and mental vigour. Good water should be supplied for every purpose, more particularly in densely crowded districts; and localities known as the hot-beds of disease, must be cleansed from all abominations.

Many other important sanitary measures might be mentioned, were their necessity not so obvious. This much, however, I would here strenuously assert. All nuisances, whether public or private, must be abated, and vested rights and individual interests must give way to the health of communities. On these points, "*salus reipublicæ*" is "*suprema lex*;" and, as on such questions there can be no mistake, there ought assuredly to be no compromise.

EXEMPTION OF CLASSES. As a counterbalance, in some degree, to the sad mortuary details contained in the previous pages, it is gratifying to state, that throughout the entire population of London, during the prevalence of the recent epidemic, several marked exceptions have been noticed in the exemption of individuals from Cholera, as well as in the rarity of the disease amongst various sections of the community. Several instances which have come under my notice appear worth relating.

The military in the metropolis, generally speaking, never were in a better state of health than during the epidemic, although a few fatal cases of Cholera occurred in different regiments. Respecting the fatal instances amongst the troops in London, it is both instructive and important to know, that in one regiment, which lost six men by Cholera, five came from a battalion quartered in the Tower, and only one from the other division occupying a barrack at the west-end. It is likewise worth adding, as an illustration of the influence which locality and individual circumstances exert in producing the disease, that one of the severest cases which a medical officer in the Guards met with, recently occurred in a soldier who had absented himself, without leave, from his barrack in the western part of London, and had passed two days in drinking with a sailor, in Ratcliff Highway. From this unhealthy district, the soldier was brought westward in custody, and placed under confinement, where the malady very soon manifested most severe symptoms. This patient recovered, although he continued in a precarious condition for some time; and, probably, had he remained for a longer period in the tainted district, or had not been placed at once under judicious treatment, the issue might have been different.

Again, amongst the metropolitan police, which, exclusive of the city force, comprises 5,600 individuals, notwithstanding the laborious duties which they often have to perform, their frequent exposure to the night air in all weathers, and especially in the most insalubrious districts, the sickness and mortality was less than might have been expected. According to the return which my friend Mr. Fisher, surgeon-in-chief to the police, has kindly favoured me with, only twenty-seven policemen have fallen victims to Cholera during the recent outbreak; that is, one in every 207 members of the force, or about .5 per cent. The particulars respecting the localities in which these twenty-seven deaths

occurred are likewise of importance, from being analogous to those observed amongst other portions of the population. Thus, of the total fatal cases recorded amongst the metropolitan police, twenty, or three-fourths, occurred south of the Thames; eleven of whom died in Southwark or its vicinity, and three in Lambeth; five were reported from the north-eastern districts; two died in Westminster, one being on the Thames; whilst *not a single fatal case by Cholera was met with amongst the whole police force stationed throughout the north-western districts of the metropolis*. No statements can be more conclusive respecting Cholera and its propagation, than those now made respecting the military in London, but more especially the metropolitan police, consisting almost exclusively of stout, healthy, and mostly young men, placed under the same discipline and regulations. The deductions to be drawn from such data are self-evident.

Having already alluded to Bridewell, it may appear superfluous to speak of other prisons; nevertheless, I must notice two other similar establishments. The first is the Cold-bath Fields House of Correction—the largest jail in England—in which the regulations, sanitary measures, dietary, &c. are carefully attended to by the authorities. At this prison, notwithstanding there being usually about 1200 inmates, not a single fatal case of Cholera has occurred during the recent epidemic, even although the disease prevailed in the neighbourhood; and it must be added, that the prisoners were otherwise quite as healthy as at any previous period. Indeed, so little sickness has been recently met with amongst the numerous population of this jail, that last week only two cases of illness were under treatment in the infirmary. The other jail referred to is the Model Prison, Pentonville, in which also no fatal case of Cholera has occurred amongst its inmates, amounting to about five hundred individuals. This immunity is, no doubt, owing to its open, airy, and elevated position, its good discipline, its scrupulous cleanliness, and plentiful supply of excellent water, much of which is pumped up from a well in the establishment.

From the workhouses in the metropolis much useful information might also be adduced. I will, however, only allude to two, the first being situated on the low ground south of the Thames, the other on an elevated position in the northern district. The former, or St. George's workhouse, Southwark, which contains, on an average, 400 inmates, is situated in the middle of one of the worst parts of the Borough, namely, the Mint. This locality, besides being very insalubrious, is inhabited by the very lowest, if not the most wretched, class of society, and amongst whom deaths by the recent epidemic have been exceedingly numerous. Nevertheless, among the ordinary residents in this establishment, only eight fatal cases of Cholera have occurred; and it is instructive to know, that these were chiefly the aged, infirm, and sickly. It was not so, however, in regard to the persons admitted from the neighbourhood; the fatal cases recorded having been principally in that class of patients. This rarity of deaths amongst the resident paupers indubitably depended upon similar causes to those detailed in other public establishments: namely, the house is well ventilated, even although an old building; it is kept very clean; the food is abundant and nutritious; whilst the water is of good quality, and plentiful. The other

workhouse to which I would also allude is that of the parish of Islington, situated on elevated ground, well drained, as also properly ventilated, and where the food is good, with water supplied by the New River. In this institution, having about 350 inmates, only two cases of Cholera have occurred, although the residents comprise many paupers of broken-down health, from years of suffering, privation, and disease. Respecting the two fatal cases of Cholera reported from this workhouse, it is instructive to state, that one was sixty-three years of age, with a chronic cough, swelled legs, and a bad constitution; the other had lived for a short time in the same house with a person who fell a victim to Cholera in an infected district, from whence she was brought, and died in the parish Infirmary.

Another illustration of immunity from Cholera, among a class of persons likely to be attacked, may be derived from the St. George and St. James's Dispensary, to which I am attached. At this institution, out of 3,252 patients, almost exclusively living in the upper wards of these two parishes, and attended by the medical officers during the by-gone six months, not a single fatal case of Cholera has occurred; whilst it is also remarkable, that fewer persons labouring under ordinary diseases have been admitted during the last three months, especially in September, than throughout the previous quarter, comprising April, May, and June.

Lastly, I would mention, that, at insurance offices, which comprise many thousand persons of the middle or upper classes of society, and on whose lives millions of money are now insured, notwithstanding deaths by Cholera have been reported at particular offices, the general mortality, from all causes, amongst the assured, has even ranged less than usual. At the London Company, to which I am the medical adviser, not only has no death by Cholera been reported, but the casualties from ordinary maladies have fallen under the average. And as similar statements have been made to me by other parties well able to give information—especially by Mr. Neison, an authority on such questions,—the opinion now advanced must be correct.

The various statements made regarding the exemption of particular places, and the immunity of different persons from attacks of Cholera are instructive, and deserve further investigation; more especially as the epidemic may, I much fear, recur at future seasons. The malady has done so in other countries, as also in England, and may do the like again, even with similar, if not with aggravated virulence. Many authors might be referred to respecting the history and previous prevalence of Cholera, but I will only now allude to Sydenham. According to him, Cholera Morbus was not only very common, but exceedingly fatal, in his day, as also previously; indeed, this epidemic disease seemed like a plague, from the mortality it occasioned; nay, it was even called, in common language, "Plague, or Gripings in the Guts". From it, during the year 1669, according to the above celebrated physician, not less than 4,385 persons died in London exclusively, which large mortality, in a population of about 674,000, makes the ratio of deaths nearly the same as during the present year. In 1670, the deaths from the same cause amounted to 3,690. The disease reappeared frequently after-

wards, coming on generally about the close of summer, or towards the beginning of autumn; in fact, similar to the recent epidemic; or, to quote the quaint expression of Sydenham, when describing the Cholera Morbus then so virulent, "it recurred as constantly as swallows in the beginning of spring, and cuckoos towards Midsummer."

Indubitably the word Cholera is not mentioned in the old Bills of Mortality, which I carefully examined at the British Museum. The expression in these reports is, "Gripings in the Guts", being, doubtless, the vulgar term, and hence adopted by the parish clerks of London when drawing up their certificates, instead of the more correct appellation contained in the works of Sydenham. This epidemic malady continued to prevail throughout the remainder of the seventeenth century, although to a less extent than at previous epochs. During the early part of the eighteenth century the complaint declined considerably; so much so, that exactly one hundred years ago, or in 1749, otherwise a very unhealthy year, seeing that 25,516 persons died in London, of whom 2,625 were carried off by Small-pox, only 148 persons died of the epidemic so common in the time of Sydenham. Subsequently, the disease became still more infrequent; and, in 1793, it had almost disappeared; as in that year, according to the old Bills of Mortality, the number of fatal cases registered, from the same cause, had fallen to fourteen, in a total of 21,749 deaths reported to have taken place from all diseases, amongst upwards of one million inhabitants, at that period resident in the metropolis.

24 Brook-street, October, 1849.