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*John & Annette Carey*  
*from their brother*  
*the Author*

# REPORTS

RELATING TO

## THE SANITARY CONDITION

OF THE

## CITY OF LONDON.

BY

JOHN SIMON, F.R.S.

SURGEON TO ST. THOMAS'S HOSPITAL, AND

OFFICER OF HEALTH TO THE CITY.

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TO

LOUIS MICHAEL SIMON,

OF THE STOCK EXCHANGE, LONDON, AND OF  
THE PARAGON, BLACKHEATH,

I DEDICATE THIS REPRINT OF MY REPORTS:

LOOKING

LESS TO WHAT LITTLE INTRINSIC MERIT THEY MAY HAVE,

THAN TO THE YEARS OF ANXIOUS LABOUR THEY REPRESENT:

DEEMING IT FIT TO ASSOCIATE

MY FATHER'S NAME

WITH A RECORD OF ENDEAVOURS TO DO MY DUTY:

BECAUSE IN THIS HE HAS BEEN MY BEST EXAMPLE;

AND

BECAUSE I COUNT IT THE HAPPIEST INFLUENCE IN MY LOT,

THAT, BOUND TO HIM BY EVERY TIE OF GRATEFUL AFFECTION,

I HAVE LIKEWISE BEEN ABLE, FROM MY EARLIEST CHILDHOOD

TILL NOW—THE EVENING OF HIS LIFE,

TO REGARD HIM WITH UNQUALIFIED AND INCREASING RESPECT.

3660

MHR



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## P R E F A C E.

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THE following Reports, officially addressed to the Commissioners of Sewers of the City of London, were originally printed only for the use of the Corporation; and although, to my very great pleasure, they have been extensively circulated through the medium of the daily press, there has continued so frequent an application for separate copies that the surplus-stock at Guildhall has long been exhausted. Under these circumstances—believing the Reports may have some future interest, as belonging to an important educational period in the matters to which they refer, I have requested the Commission to allow their collective reprint and publication; and this indulgence having been kindly accorded me, I have gathered into the present volume all my Annual Reports, together with a special Report suggesting arrangements for extramural burial.

From the nature of the work, I have not considered myself at liberty to make those extensive alterations of text which usually belong to a second edition. I have restricted myself to a few verbal

corrections, and to rectifying or omitting some unimportant paragraph, here or there, in case its matter has been more fully or more correctly stated in parts of a subsequent Report. Frequently, where I have wished to explain or qualify passages in the text, I have added foot-notes; but these are distinguished as interpolations by the mark—J. S., 1854.

My Reports lay no claim to the merit of scientific discovery. Rather, they deal with things already notorious to Science; and, in writing them, my hopes have tended chiefly towards winning for such doctrines more general and more practical reception. It has seemed to me no unworthy object, that, confining myself often to almost indisputable topics—to truths bordering on truism, I should labour to make trite knowledge bear fruit in common application.

Nor in any degree do they profess to be cyclopædic in the subject of Preventive Medicine; for it is but a small part of this science that hitherto is recognised by the law; and that—so far as the metropolis is concerned, scarcely beyond the confines of the City. It would have been an idle sort of industry, to say much of places or of matters foreign to the jurisdiction of those whom I officially addressed.

In re-publishing documents which proclaim ex-

treme sanitary evils, as affecting the City, I think it right to draw attention to the dates of the several Reports, and to state that for the last five years many of these evils have been undergoing progressive diminution, of late at a rapid and increasing rate; while, at their worst, they represented only what I fear must be considered the present average condition of our urban population.

This national prevalence of sanitary neglect is a very grievous fact; and though I pretend to no official concern in anything beyond the City boundaries, I cannot forego the present opportunity of saying a few words to bespeak for it the reader's attention. I would beg any educated person to consider what are the conditions in which alone animal life can thrive; to learn, by personal inspection, how far these conditions are realised for the masses of our population; and to form for himself a conscientious judgment as to the need for great, if even almost revolutionary, reforms. Let any such person devote an hour to visiting some very poor neighbourhood in the metropolis, or in almost any of our large towns. Let him breathe its air, taste its water, eat its bread. Let him think of human life struggling there for years. Let him fancy what it would be to himself to live there, in that beastly degradation of stink, fed with such bread, drinking such water. Let him enter

some house there at hazard, and—heeding where he treads, follow the guidance of his outraged nose, to the yard (if there be one) or the cellar. Let him talk to the inmates: let him hear what is thought of the bone-boiler next door, or the slaughter-house behind; what of the sewer-grating before the door; what of the Irish basket-makers upstairs—twelve in a room, who came in after the hopping, and got fever; what of the artisan's dead body, stretched on his widow's one bed, beside her living children.

Let him, if he have a heart for the duties of manhood and patriotism, gravely reflect whether such sickening evils, as an hour's inquiry will have shown him, ought to be the habit of our labouring population: whether the Legislature, which his voice helps to constitute, is doing all that might be done to palliate these wrongs; whether it be not a jarring discord in the civilisation we boast—a worse than pagan savageness in the Christianity we profess, that such things continue, in the midst of us, scandalously neglected; and that the interests of human life, except against wilful violence, are almost uncared for by the law.

And let not the inquirer too easily admit what will be urged by less earnest persons as their pretext for inaction—that such evils are inalienable from poverty. Let him, in visiting those homes

of our labouring population, inquire into the actual rent paid for them—dog-holes as they are; and studying the financial experience of Model Dormitories and Model Lodgings, let him reckon what that rent can purchase. He will soon have misgivings as to dirt being cheap in the market, and cleanliness unattainably expensive.

Yet what if it be so? Shift the title of the grievance—is the fact less insufferable? If there be citizens so destitute, that they can afford to live only where they must straightway die—renting the twentieth straw-heap in some lightless fever-bin, or squatting amid rotten soakage, or breathing from the cesspool and the sewer; so destitute that they can buy no water—that milk and bread must be impoverished to meet their means of purchase—that the drugs sold them for sickness must be rubbish or poison; surely no civilised community dare avert itself from the care of this abject orphanage. And—*ruat cœlum*, let the principle be followed whithersoever it may lead, that Christian society leaves none of its children helpless. If such and such conditions of food or dwelling are absolutely inconsistent with healthy life, what more final test of pauperism can there be, or what clearer right to public succour, than that the subject's pecuniary means fall short of providing him other conditions than those? It may

be that competition has screwed down the rate of wages below what will purchase indispensable food and wholesome lodgment. Of this, as fact, I am no judge; but to its meaning, if fact, I can speak. All labour below that mark is masked pauperism. Whatever the employer saves is gained at the public expense. When, under such circumstances, the labourer or his wife or child spends an occasional month or two in the hospital, that some fever-infection may work itself out, or that the impending loss of an eye or a limb may be averted by animal\* food; or when he gets various aid from his Board of Guardians, in all sorts of preventable illness, and eventually for the expenses of interment, it is the public that, too late for the man's health or independence, pays the arrears of wage which should have hindered this suffering and sorrow.

Probably on no point of political economy is there more general concurrence of opinion, than against any legislative interference with the price of labour. But I would venture to submit, for the

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\* Twenty years' daily experience of hospital surgery enables me to say, from personal knowledge, that our wards and out-patient rooms are never free from painful illustrations of the effects of insufficient nutrition—cases, in fact, of chronic starvation-disease among the poor; such disease as Magendie imitated, in his celebrated experiments, by feeding animals on an exclusively non-azotised diet.



consideration of abler judges than myself, that before wages can safely be left to find their own level in the struggles of an unrestricted competition, the law should be rendered absolute and available in safeguards for the ignorant poor—first, against those deteriorations of staple food which enable the retailer to disguise starvation to his customers by apparent cheapenings of bulk; secondly, against those conditions of lodgment which are inconsistent with decency and health.

But if I have addressed myself to this objection, partly because—to the very limited extent in which it starts from a true premiss, it deserves reply; and partly because I wish emphatically to declare my conviction, that such evils as I denounce are not the more to be tolerated for their rising in unwilling Pauperism, rather than in willing Filth; yet I doubt whether poverty be so important an element in the case as some people imagine. And although I have referred especially to a poor neighbourhood—because here it is that knowledge and personal refinement will have least power to compensate for the insufficiencies of public law; yet I have no hesitation in saying that sanitary mismanagement spreads very appreciable evils high in the middle ranks of society; and from some of the consequences, so far as I am aware, no station can call itself exempt.

The fact is, as I have said, that, except against wilful violence, life is practically very little cared for by the law. Fragments of legislation there are, indeed, in all directions: enough to establish precedents—enough to testify some half-conscious possession of a principle; but, for usefulness, little beyond this. The statutes tell that now and then, there has reached to high places the wail of physical suffering. They tell that our law-makers, to the tether of a very scanty knowledge, have, not unwillingly, moved to the redress of some clamorous wrong. But—tested by any scientific standard of what should be the completeness of sanitary legislation; or tested by any personal endeavour to procure the legal correction of gross and glaring evils; their insufficiencies, I do not hesitate to say, constitute a national scandal, and, perhaps in respect of their consequences, something not far removed from a national sin.

In respect of *houses*—here and there, under local Acts of Parliament, exist sanitary powers, generally of a most defective kind; pretending often to enforce amendments of drainage and water-supply; sometimes to provide for the cleansing of filthy and unwholesome tenements; in a few cases to prevent over-crowding; very rarely to ensure stringent measures against houses certified to be unfit for human habitation. Occasionally—but

a few lines would exhaust the list, an application of the Public Health Act, or some really efficient local Act, has put it within reach of the authorities to do all that is needful under certain of these heads. But I know of no such town that would bear strict examination as to its possession of legal powers to fulfil, what I presume must be the principle contemplated by the law—that no house should be let for hire unless presenting the conditions indispensable for health, or be hired for more occupants than it can decently and wholesomely accommodate.\* However this

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\* In addition to the ordinary powers—given, for instance, in the Public Health or City Sewers Act, for abating accumulated nuisances and for enforcing wholesome constructional arrangements; a principal requirement of all bodies having jurisdiction for the public health is, that there should be vested in them some authority, *enabling them to regulate*, in the spirit of the Common Lodging House Act, *all houses which are liable to be thronged by a dangerous excess of low population*. Almost invariably such houses are of the class technically known as ‘tenement-houses,’ i. e., houses divided into several tenements or holdings; whereof each—though very often consisting but of a single small room, receives its inmates without any available restriction as to their sex or number, and without regard to the accommodation requisite for cleanliness, decency, and health. The inhabitants of such houses, especially where of the lower order of Irish, constantly lapse into the most brutal filthiness of habits, and live in almost incredible conditions of dirt, over-crowding, and disease. See sections of the following Reports, beginning severally at pages 44, 146, and 195. Powers for dealing with these evils might be given to Local Boards of Health, most usefully, I think, in some such form as the following: 1) that—in respect of any house occupied by more than one family, if it be

may be expressed, and in whatever laws embodied, local or general, I will venture to say that no Government should suffer a town, either to be without the means of enforcing this principle, or, having such means, to shirk their exercise. Our Constitution may properly concede that local representative authorities shall have their option whether, for sanitary purposes, to fall under a general law, or to have Local Improvement Acts of their own; but, in the present state of knowledge, it certainly seems incontestable that one or other of these alternatives should be compulsory, and that all Local

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situate in any court, alley, or other place having no carriage-way, and be not assessed to the poor-rate at a higher rental than £..... *per annum*; or if in it any occupied holding consist of only one room, provided the rent of such room do not exceed the sum of .....shillings per week, or if in it there reside, or within three months previous have resided, any person receiving parochial relief, medically or otherwise; on the certificate of a duly authorized medical officer, that any such house, or part thereof, is habitually in a filthy condition, or that from over-crowding or defective ventilation the health of its inmates is endangered, or that there has prevailed in it undue sickness or mortality of an epidemic or infectious kind; the Local Board may call upon its owner to register it in a book kept for this purpose; and in respect of all houses thus registered, the Local Board may make rules for periodical washing, cleansing, and limewhiting, and for the regular removal of all dust or refuse-matter, may fix the number of tenements into which it shall be lawful to divide any such house, or the total number of inmates who may at one time be received therein, may require its better ventilation by the construction of additional windows or louvres, and may from time to time make such other regulations and orders as they shall judge necessary for the maintenance of health and decency; and may recover from the owner or lessee of any such house penal-

Improvement Acts should be required, in their sanitary clauses, to come up to the standard of the Public Health Act of the time, whatever it may be.

Under circumstances like those just adverted to, may be found traces of enactment against *offensive and injurious trades*. Unregulated slaughtering throughout all London, except the City, tallow-melting in St. Paul's church-yard, bone-boiling beside Lambeth Palace, may serve to illustrate the

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ties for neglect of any legal requisitions, rules, and orders, as aforesaid: 2) that—on the certificate of a duly authorised medical officer, that the condition of any house or room is such as to render probable the rise or the spread of infectious and dangerous disease among its inmates, the Local Board may cause the owner or lessee of such house to be summoned before a magistrate; who, after due hearing, or in default of the owner's or lessee's appearance, may order the house, or any part of it, to be evacuated of all tenants within such time as he shall judge fit, and not again to be tenanted till after licence from the Local Board given on the certificate of their medical officer that its causes of unhealthiness are abated; and the magistrate may enforce penalties for non-compliance with his order, as aforesaid: 3) that—after an Order in Council bringing into action the extraordinary clauses of the Nuisances Removal Act, the Local Board, on receiving the certificate of their medical officer that any house, or part of house, is in such condition as to be imminently dangerous to the lives of its inmates in respect of the prevailing epidemic, or any similar disease, may issue a peremptory order for its evacuation, and may recover, from the owner or lessee to whom such order is addressed, penalties for every day during which, or part of which, after such order, the house, or any part thereof, continues to be tenanted; nor, under like penalties, shall it be lawful, except after written licence from the Local Board, given as aforesaid, to allow such house to be re-occupied.

completeness and efficiency of these laws—even in our metropolitan area. Here we greatly lack some competent authority, on the part of the Government, to investigate all circumstances connected with such establishments, generally; to suggest laws for their prospective restriction, as to places wherein they may lawfully settle; and to frame regulations—enforceable by any Local Board of Health, for ensuring that all available measures be employed to mitigate their nuisance. Considering the circumstances under which many of these establishments have existed, no one can entertain a thought, that—even for the public health, they should be liable to the tyranny of an unconditional displacement. But if there existed—as undoubtedly there should exist, some skilled tribunal, competent to speak on the subject; then, I will venture to say, it might be quite in accordance with our English sense of liberty, that—after a certain condemnatory verdict by this tribunal, it should be open to the Local Board of Health to procure their expulsion, on payment of whatever compensation an ordinary jury might award.

Again, with *factories*; thanks to Lord Shaftesbury's indefatigable benevolence, the law has appointed an inspection of certain establishments, a restriction of their hours of labour, and some care against the dangers of unboxed machinery.

And with mining also the law has interfered, chiefly as to the ventilation of mines; but hitherto so ineffectively that, while I write, the coal-miners are remonstrating with the Legislature on the thousand lives *per annum* still sacrificed through the insufficient protection accorded them. If there be meaning in this legislation—if it imply any principle, the meaning and the principle require to be developed into a general law, that every establishment employing labour be liable to inspection and regulation in regard of whatever acts and conditions are detrimental or hazardous to life. If factory-children are cared for, lest they be over-worked; and miners, lest they be stifled; so, for those who labour with copper, mercury, arsenic, and lead, let us care, lest they be poisoned! for grinders, lest their lungs be fretted into consumption! for match-makers, lest their jaws be rotted from them by phosphorus! And here let it again be noticed, as in the class of cases last spoken of, how greatly wanted is some skilled tribunal, to form part of any lawful machinery which might ensure that, in these and similar instances, no precautions necessary to life are withheld through ignorance or parsimony.

Against *adulterations of food*, here and there, obsolete powers exist, for our ancestors had an eye to these things; but, practically, they are of no

avail. If we, who are educated, habitually submit to have copper in our preserves, red-lead in our cayenne, alum in our bread, pigments in our tea, and ineffable nastinesses in our fish-sauce, what can we expect of the poor? Can they use\* galactometers? Can they test their pickles with ammonia? Can they discover the tricks by which bread is made dropsical†, or otherwise deteriorated in value, even faster than they can cheapen it in price? Without entering on details of what might be the best organisation against such things, I may certainly assume it as greatly a *desideratum*, that local authorities should uniformly have power to deal with these frauds (as, of course, with every sale of decayed and corrupted food) and that they should be enabled to employ skilled officers, for detecting at least every adulteration of bread and every poisonous admixture in condiments and the like.

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\* The proverbial dilutions of milk are not its only deteriorations. Cows are so ill kept in London, and in consequence so often sickly, that milk suffers—sometimes by mere impoverishment, sometimes by much graver derangements. If there were instituted a proper Inspection of Provisions, one function of its officers should be to visit cow-houses, and to prevent the distribution of milk thus damaged or infected. I suspect that a sanitary reform of these establishments would make a sensible difference to the nursery-population of the metropolis.

† A chief artifice in the cheapening of bread is to increase its weight by various means which render it retentive of water. The other usual frauds consist in the employment of inferior flours—either not cereal, or damaged and partially deglutinised.



In some respects this sort of protection is even more necessary, as well as more deficient, in regard to *the falsification of drugs*. The College of Physicians and the Apothecaries' Company are supposed to exercise supervision in the matter; so that at least its necessity is recognised by the law. The security thus afforded is, in practice, null. It is notorious in my profession that there are not many simple drugs, and still fewer compound preparations, on the standard strength of which we can reckon. It is notorious that some important medicines are so often falsified in the market, and others so often mis-made in the laboratory, that we are robbed of all certainty in their employment. Iodide of potassium—an invaluable specific, may be shammed to half its weight with the carbonate of potash. Scammony, one of our best purgatives, is rare without chalk or starch, weakening it, perhaps, to half the intention of the giver. Cod-liver oil may have come from seals or from olives. The two or three drops of prussic acid that we would give for a dose may be nearly twice as strong at one chemist's as at another's. The quantity of laudanum equivalent to a grain of opium being, theoretically, 19 minims; we may practically find this grain, it is said, in 4.5 minims, or in 34.5. And my colleague, Dr. R. D. Thomson, who has much experience in these matters, tells me that of

calamine—not indeed an important agent, but still an article of our pharmacopœia—purporting daily to be sold at every druggist's shop, there has not for years, he believes, existed a specimen in the market.\*

Again, with the *promiscuous sale of poisons*, what incredible laxity of government! One poison, indeed, has its one law. Arsenic may not be sold otherwise than coloured, nor except with full registration of the sale, and in the presence of a witness known to both buyer and vender. Admirable, so far as it goes! but why should arsenic alone receive this dab of legislation? Is the principle right, that means of murder and suicide should be rendered difficult of access for criminal purposes? Does any one question it? Then, why

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\* Dr. Thomson tells me that he has known white precipitate of mercury sold in hundred-weights as calomel, and in one case (he believes by accident or ignorance) as trisnitrate of bismuth. In my text I have endeavoured to adduce such illustrations as I suppose to be most notorious; but I may refer the reader to various interesting papers published, through the last two or three years, in the LANCET (*Analytical Sanitary Commission*) from one of which I quote the astounding instance, given above, of variations in the strength of laudanum. Mr. Thomas Taylor, of Vere Street, informs me that, whereas an ounce of laudanum should contain about four grains of morphia, he finds the actual quantity varying in different specimens from two grains to six; and that in two specimens of solid opium, outwardly alike and supposed to be of equal quality, he has found the per centage of morphia to vary from  $3\frac{1}{2}$  to 10. It requires little instruction in medicine to appreciate these facts.

not legislate equally against all poisons?—against oxalic acid and opium, ergot and savin, prussic acid, corrosive sublimate, strychnine?

Nor can our past legislators be more boastful of their labours for the *medical profession*—either for its scientific interests, or for the public protection against ignorance and quackery.\* Nearly two dozen corporate bodies within the United Kingdom are said to grant licences for medical practice; and I hardly know whether it lessens or aggravates this confusion, that such licences are in many cases partial; that one licentiate may practise north of the Tweed, but nowise to the south; that one may practise in London, another only seven miles beyond it. Not that the licence seems much to matter! for innumerable poachers in all directions trespass on what the law purports to sell as a secured preserve for qualified practitioners: their encroachments are made with almost certain im-

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\* Legislative passiveness towards scientific medicine is not the only evil we have to complain of. Surely, in selling Letters Patent for the protection of quack-medicines—in seeming to sanction and authenticate whatever lies their proprietor may post upon the wall, the State demeans itself into complicity with fraud, and soils its fingers with something fouler than the Vespasian tax. It illustrates the curious *forgetfulness* shewn towards medicine by the Legislature, that this immoral practice of giving patents for pretended cures of disease should have been allowed to continue—as of course it must have continued, solely by oversight, till past the middle of the nineteenth century.

punity; and—as for the titles of the Profession, any impostor may style himself *doctor* or *surgeon* at his will. Even where licences are held, conveying identical titles, they imply neither equal privileges (as I have said) nor even uniform education. The law has troubled itself little as to the terms on which they shall be granted; and the qualifications exacted from candidates—the conditions preliminary to their becoming eligible for licence, vary in so remarkable a degree among the many corporate bodies which are fountains of this honour, that the credentials conferred have really little meaning, apart from a context which the public is unable to supply. It is charged against particular institutions, that their degrees and licences are attained with a very inglorious facility; and when it is recollected that the issuing of such testimonials is a source—sometimes a chief source—of income to the corporations which grant them, it will be felt that at least there must exist great danger of this reproach being sometimes deserved. If a national title to practise medicine is to be granted by several Boards, and if yet the tenure of that title is to determine public confidence in favour of its holder, it would seem indispensable that some guarantee should be given for these several licences representing equal qualifications—some guarantee that the holder in each case possesses professional

knowledge, and has enjoyed professional opportunities, at least above some uniform standard recognised as a *minimum* qualification by all the diplomatising bodies. Indispensable, however, as this may seem, years of endeavour have failed to attain it. What is called *medical reform* has been agitated longer than I can remember; and more than one minister has been willing to legislate for its promotion. Unfortunately the very magnitude of the evils has delayed their cure. With the constitution I have described—a system of conflicting jurisdictions, of licences without titles, and titles without licences, how could we escape internal dissension? how escape the antagonism, perhaps the jealousies, of rival corporations and of different professional classes? Home-Secretaries have had little leisure to fathom these things to the bottom. Unexamined and unadjudicated by any competent authority, such influences have bewildered public judgment, made statesmen regard us with despair, postponed legislative correction, and maintained us in a state of anarchy and confusion, best to be appreciated when we compare with our own the organisation and government of the legal profession.

And be it noted, how this reacts upon the State. So completely is our government dissevered from Science in general, and, most of all, from the sci-

ences relating to Life, that, on such subjects, there exists not for state-purposes anything like a tribunal of appeal. The Legislature recognises no *Medical Authority*. Occasionally this fact stands out in painful conspicuousness, and brings most injurious results. In contested cases requiring scientific testimony—before Parliamentary Committees, for instance, and in a variety of legal proceedings,—instead of the Court having satisfactory power of referring particular questions to skilled impartial adjudicators, the uniform practice is, that scientific men are retained on opposite sides, to support partisan interests. The advantages, such as they are, which belong to this system, might, I believe, easily be obtained under altered arrangements: the disadvantages are glaring. It might be invidious to refer to illustrations of their reality: but it is of course impossible to doubt of the working of this system, that, in so far as it makes each witness feel himself engaged to maintain the views of his employer, it tends towards a moral prostitution and subornation of science. In the interests of truth, it would surely seem desirable that scientific evidence should be tendered, so far as may be, in a judicial spirit towards the suit; either that the technical point should be referred to a technical jury, or that the technical witness should be summoned at the Court's discretion, should be ex-

mined in-chief by the Court, and should be subject only to such cross-examination as may procure the most complete statement of his knowledge on the matter in hand.

Having said so much on the defects and the wrongs of our existing sanitary condition, perhaps I may venture to speak of the almost obvious remedy. 'Almost obvious' I say; for surely no one will doubt that this great subject should be dealt with by comprehensive and scientific legislation; and I hardly see how otherwise, than that it should be submitted in its entirety to some single department of the executive, as a sole charge; that there should be some tangible head, responsible—not only for the *enforcement* of existing laws, such as they are or may become, but likewise for their *progress* from time to time to the level of contemporary science, for their *completion* where fragmentary, for their *harmonisation* where discordant.

If—as is rumoured, the approaching re-constitution of the General Board of Health is (after the pattern of the Poor-law Board) to give it a Parliamentary President, that member of the Government ought to be open to challenge in respect of every matter relating to health. What, for this purpose, might be the best subordinate arrangements of such a Board, it would take a volume to discuss. But at least as regards its constituted

head, sitting in Parliament, his department should be, in the widest sense, to *care for the physical necessities of human life*. Whether skilled co-adjutors be appointed for him or not; engineers—lawyers—chemists—pathologists; whether he be, as it were, the foreman of this special jury, or, according to the more usual precedent of our public affairs, collect advice on his own responsibility, and speak without quotation of other authority than himself, his voice, unless the thing is to be a sham, must represent all these knowledges.

The people, through its representatives, must be able to arraign him wherever human life is insufficiently cared for.

He must be able to justify or to exterminate adulterations of food; to shew that alum ought to be in our loaves, or to banish it for ever; to shew that copper is wholesome for dessert, or to give us our olives and greengages without it; to shew that red-lead is an estimable condiment, or to divert it from our pepper-pots and curries.

Similarly with drugs and poisons—the alternatives of life and death—a minister of Public Health would, I presume, be responsible for whatever evils arise in their unlicensed and unregulated sale. He would hardly dare to acquiesce in our present defencelessness against fraud and ignorance; in doses being sold—critical doses, for the strength of



which we, who prescribe them, cannot answer within a margin of *cent. per cent.*; or in penny-worths of poison being handed across the counter as nonchalantly as cakes of soap.\* Surely, before he had been six months in office, he would have procured some enactment to remedy this long neglect of the legislature, by providing that the druggist's trade be exercised only after some test of fitness, and in subjection to certain regulations.

Within his province, likewise, it would fall to be cognisant of all that relates to the constitution of the Medical Profession. The difficulties which have baffled successive Home-Secretaries might soon find their solution in the less divided attention which he could bring to their study. Amid conflicting opinions and an apparent scramble for power, he would soon distinguish where might be the strife of jealousy and covetousness, where a truthful zeal for the honour and efficiency of medicine. I think he could not be long in curing our more scandalous anomalies. Probably—unless human bowels require other doctoring in London

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\* Without referring to what may be considered rare—the sale of poison for the purposes of intended homicide, I may remind the reader of the very dreadful facts collected by the Commissioners on Trades and Manufactures, as to the immense sales of opium in our principal manufacturing towns, for the purpose of quieting—and with the effect of killing, children, while their poor mothers are absent from home in their several occupations.

than in Manchester, he would manage that a doctor there should be a doctor also here; that no licence for the partial practice of medicine should be recognised—no licence admitting a man to do in Edinburgh what it would be a misdemeanour for him to do in Greenwich. And obviously, in order to this—since a professional diploma is the only criterion by which the public can measure the competence of those who seek their patronage, he would see that, as far as may be, the various licensing bodies exact from their candidates equal and sufficient qualifications; that the diploma entitling a man to call himself Surgeon or Physician, Accoucheur or Apothecary, mean the same thing—imply the same education, whether it be got in Scotland, Ireland, or England; and that any falsification of such diploma, or any unauthorised assumption of the title which implies its possession, be promptly punishable at law.\*

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\* This check at least seems indispensable, for the reason above given, that a professional diploma is the only criterion by which the public can measure professional competence; and for the validity of such a criterion, it therefore, I think, becomes the duty of a government, on behalf of the public, to provide. For anything beyond this (except in one particular case) the matter might take its natural course. No law can supersede a necessity for common sense in the subject; and medicine, I think, requires no *protection*. Let my neighbour, by all means, if he desire it, send for a green-grocer to reduce his dislocation or assuage his gout! and let him take the consequences of his folly, in a spoilt limb or in a hair's

Into the hands of this new minister—advised, perhaps, for such purposes by some permanent commission\* of skilled person, would devolve the

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breadth escape with his life. Only—let the green-grocer be punishable, if he seek this office under false pretences, calling himself by any title which implies a professional qualification. And, for what harm he may do—let him of course (as would, if necessary, the presidents of our colleges) be prepared to abide before judge and jury his trial for malpractice. But, in strict adhesion to the principle I have professed, that protection is wanted, not for the profession, but for the public, I would suggest one exception to what otherwise might be universal free-trade in medicine. I refer to the case of druggists; who, whenever the Legislature may awake to the necessity of regulating their trade, ought, I think, to be expressly prohibited from the treatment of disease. To an immense majority of our population—to all the under-educated classes, the druggist's shop appears an emporium for medical skill, as well as for medical appliances. They probably have some vague over-estimate of our art of healing, and think perhaps that the several bottles on the shelf correspond to the several ailments they can specifically cure. They ask for something "good for a dropsy," or "good for a wasting," or "good for a palpitation;" not knowing how much skill may be requisite to interpret the symptom; not knowing that, to our highest skill, there is no medicine thus indiscriminately, or even generally, "good." At present almost universally, druggists, with no medical qualification, are tampering more or less with serious medical responsibilities; and the mischief thus occasioned—especially among the poorer classes, is a matter of notoriety, on which persons engaged in hospital practice would be competent and tolerably impartial witnesses. It is because this evil arises in the *almost inevitable ignorance* of those who chiefly suffer from it, that, in accordance with the principle above suggested, I think it deserves consideration from the Legislature.

\* There are many instances in my mind, some already adverted to, where the existence of a standing jury for scientific—especially for sanitary, purposes might be of great utility. It is an organisation which prevails extensively in France, under the name of

guardianship of public health against combined commercial interests, or incompetent administration. He would provide securities for excluding sulphur from our gas, and animalcules from our water. He would come into relation with all Local Improvement Boards, in respect of the sanitary purposes of their existence. To him we should look, to settle at least for all practical purposes the polemics of drainage and water-supply; to form opinions which might guide Parliament, whether street sewers really require to be avenues for men, whether hard water really be good enough for all ordinary purposes, whether cisternage really be indispensable to an urban water-supply.

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*Conseils de Salubrité*; forming, in most of the large towns there, a constant board of reference for the municipality, in respect of sanitary regulations. *Mutatis mutandis*, it might become invaluable as an English institution, in respect of many matters touched upon in this sketch; and perhaps with some division of duties, into such as would best belong to a General Board of the kind, and such as might properly be vested in Local Boards. To determine the indispensable conditions of healthy lodgment; to examine the influence of trades and occupations, and to devise the regulations they may require, for the neighbourhood's sake, or for their operatives'; to supervise the sale of food and drugs; to be cognisant of medical matters; would seem, either locally or generally, to require the co-operations of several skilled persons. But, though I have spoken of such, as indispensable jurors for these subjects, I do not forget that other interests than those of life may need to be consulted. For the fair representation of these, the lay faculty of *educated common-sense* will fulfil an inestimable usefulness, if it may be there to mediate between science, which is sometimes crotchety, and trade, which is sometimes selfish.

Organisations against epidemic diseases—questions of quarantine—laws for vaccination, and the like, would obviously lie within his province; and thither, perhaps, also his colleagues might be glad to transfer many of those medical questions which now belong to other departments of the executive—the sanitary regulation of emigrant ships, the ventilation of mines, the medical inspection of factories and prisons, the insecurities of railway traffic, *et hoc genus omne*.

There is another subject respecting which I should reluctantly forego the present opportunity of saying something. To the philosopher, perhaps, any partial sanitary legislation—even for a metropolis, may seem of low importance, as compared with our commanding need that the general legislation of the country be imbued with deeper sympathies for life. Yet London is almost a nation in itself; and the good which might be effected by its sanitary regeneration would, even as example, be of universal influence. Now, at this moment, there seems a chance—such a chance as may not soon recur—for gaining a first step towards this consummation. The re-construction of the Metropolitan Commission of Sewers, on the principle of local representation, affords extraordinary facilities for providing London, at length, with an efficient sanitary government. For, while any administra-

tion for this purpose would require to be entrusted with very extensive and very stringent powers, it seems probable that such authority might by the public be willingly conceded to a body constituted, in great part, of persons representing local interests. The jurisdiction required would be substantially such as is already vested in the City Commissioners of Sewers, for the sanitary control of the city; the concession of which—because to a representative body—was never any matter of municipal dispute. In so vast a government as that of the metropolis, Local Boards of Health for its various sections would seem indispensable; it is presumed that these boards\* would be represented in the general Commission; which, in conjunction with them, and including certain skilled assessors, might constitute a complete sanitary organisation, consultative and executive.

I have one word more to say about the Reports. They have been received by the public with such

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\* It would seem premature to discuss what might be the best constitution of such Local Boards for the metropolis; but it will appear to the reader, on a moment's reflection, that there would be no difficulty in finding materials for their organisation. If, according to suggestions lately ventilated, municipal institutions should be given to the parts of London hitherto without them; these new corporations would probably have sanitary functions allotted them, and might readily become Local Boards of Health under such a constitution as I have sketched. If, on the other hand, our present non-municipal system were to be continued, probably our several Boards of Guardians might seem specially proper to act as Local Boards of

remarkable indulgence and favour, that I feel some anxiety lest I may seem to have plumed myself with other feathers than my own. Let me, therefore, at least in part, confess my debts.

Before my first enlistment in the service of public health, others had fought this great cause with rare courage and devotion; establishing its main principles in a manner to require no corroboration, and to admit little immediate increase. The true patriarchs of the cause in this country are the present working members of the General Board of Health. The constitution of my city appointment is quite independent of this Board; but I should be acting an unworthy part if I refrained from acknowledging, that, in innumerable instances, I have gathered most valuable knowledge from the Board's official publications, and that, in personal intercourse with its members and officers, I have had abundant reason to be grateful for information invariably given with that frank kindness which be-

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Health; first, as being elected representative bodies, already invested with certain authority of the kind—as, for instance, under the Nuisances Removal Act; secondly, because various of their officers would be almost indispensable parts of any sanitary machinery. Indeed, my experience of such matters suggests it to me as not unimportant, that, under any arrangement which may be made, the jurisdiction of Local Boards of Health should, at least in area, be conterminous with Poor Law Unions; so that those who administer sanitary affairs—affairs which are always chiefly relative to the poor—may, as far as possible, in their several districts, come into relation with single sets of Poor Law officers.

longs to brotherhood in science, and to sympathy for common objects.

I must likewise acknowledge constant obligations to the courtesy of the Registrar-General, and express with how much pleasure and instruction I have studied the works of his inestimable office. Especially I would offer my tribute of respect to Dr. Farr's learning and industry, as well as to that capacity for generalisation which the world has long recognised in his eloquent and thoughtful writings.

And, though this be not the place to boast of private friendships, I may venture to say that there are few topics relating to sanitary medicine that I have not enjoyed the advantage of discussing with men who have given genius, inquiry, and reflection to their development.

Thank God! the number of persons capable of apprehending the cause, and ready to take interest in its promotion, is now daily on the increase. If some minister of Public Health could take his seat in the House of Commons—some minister knowing his subject and feeling it, I believe he would find no lack of sympathy and co-operation. The world abounds with admirable wishes and intentions, that vaguely miscarry for want of guidance. How many men can get no farther in their psalm of life than the question, *in quo corriget*. To such—not masters of the subject, but willing and eager to be its servants, an official leader might be



everything : for in great causes like this, where the scandal of continued wrong burns in each man's conscience, the instincts of justice thirst for satisfaction. What can we do or give—how shall we speak or vote, to lessen these dreadful miseries of sanitary neglect—is, at this moment, I believe, the fervent inquiry of innumerable minds, waiting, as it were for the word of command, to act.

How much of this generous earnestness towards the cause exists in society—how much desire to grasp any reasonable opportunity of good has lately happened to fall under my notice. Last winter, when the signs of the times were making us fear that Cholera would presently again be epidemic in London, it was remembered that, in the greater part of the metropolis, nothing whatever had been done since the last invasion to give immunity against the returning disease. It was remembered—too late, how indescribably dreadful a thing is the epidemic prevalence of sudden death. And the poor were thought of—in their unprotectedness, their filth, their ignorance. Among the persons thus aroused, was a gentleman whom I reluctantly leave unnamed; saying of him only, that, from a distinguished position in official life, he had retired to literary enjoyments, amid which he bears the imputation of many unacknowledged writings which charm and instruct the public. When the rumours of the pestilence began, he too heard

and read and became aghast. The notion that 'in a skilful, helpful, Christian country nothing should be done' against these impending dangers—that the poor should be left 'defenceless, huddled together in some dismal district, not more helpful than women'—was felt by him, he wrote, 'deeply as a disgrace;' and he pleaded that, 'on a great and pressing occasion, it remains for the thoughtful, the rich, and the benevolent, to try and do these needful things for the people.\*' Let us, he urged, endeavour to meet this shameful reproach; let us combine voluntary charitable assistance for extemporaneous sanitary measures, rapid, though partial; let us get a hundred thousand pounds and do what we can in aid of local authorities in the poorest districts—in Bethnal Green, in Shoreditch. Eventually this plan was abandoned, at least for the time. There was argued against it, that prompt legislation might do more good, with less exoneration of local responsibility. Whether rightly or wrongly, the latter view was acted on; and in accordance with it, the gentleman first adverted to (waving his own hopes and wishes in the matter) took active part in framing suggestions,† which Lord Palmer-

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\* I quote from a pamphlet printed by him for private circulation. It was entitled '*Health-Fund for London; some Thoughts for next Summer: by Friends in Council.*'

† These have since been laid before the House of Lords, on the motion, I think, of Lord Harrowby, who took much interest in the subject.

ston had expressed himself willing to accept, for modifying the laws of Nuisance and Disease-Prevention to a form more suitable for the apprehended emergency. But, in the meantime, what had happened? The author of the plan, as it were at a moment's notice, had seemed to draw round himself half the intellectual and moral strength of the metropolis. Himself setting aside the literary ambition of his life, he found others ready to meet him with their several self-sacrifices. Over-worked men of science and of business, who afford no time to relaxation; favourites of society, who might have been suspected of mere shuddering at distasteful subjects; men of high laborious rank in Church and State; poets; heads of professions; minds that guide the tastes and morals of the country, or feed its imagination; not least, the invalid from his distant wintering-place; men, in short, immersed in all kinds and grades of occupation, were either bodily present at the deliberations referred to, or were writing about the plan in terms of warm interest, anxious to promote whatever usefulness could be shown them. About the means there was discussion—about the object, none; nor lukewarmness. All were competing, by gifts of time and labour, to snatch some opportunity of serving this neglected cause.

Such—to return to my text—such, I am deeply assured, would be the spirit which a minister of

Public Health would find abundantly on his side in Parliamentary discussion, and in the Press. There is no attachment to the incongruities I have sketched as belonging to our abortion of a sanitary system. Still less is there any want of feeling for the poor—any reluctance to raise their state and better their circumstances—any unconsciousness that these things are great solemn duties. On the contrary, everywhere there is the conviction that *something* must be done; everywhere a waiting for authority to say *what*. But, the trumpet giving an uncertain sound, who can prepare himself to battle? Knowledge, and method, and comprehensiveness, are wanted—the precise, definite, categorical impulses of a Parliamentary leader, who can recognise principles and stick to them.

And for such a minister, what a career! It would be idleness to speak of the blessings he could diffuse, the anguish he could relieve, the gratitude and glory he could earn. A heathen can tell him this. *Homines enim ad Deos nullâ re propius accedunt quam salutem hominibus dando. Nihil habet nec fortuna tua majus quam ut possis, nec natura tua melius quam ut velis, conservare quam plurimos.*

Upper Grosvenor Street,  
May 15th, 1854.

# R E P O R T S

RELATING TO

## THE SANITARY CONDITION

OF THE

## CITY OF LONDON.

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### FIRST ANNUAL REPORT.

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TO THE HON. THE COMMISSIONERS OF SEWERS OF THE  
CITY OF LONDON.

*November 6th, 1849.*

GENTLEMEN,

**D**URING the 52 weeks dating from October 1st, 1848, to September 29th, 1849, there died of the population of the City of London 3763 persons.

The rate of mortality, estimated from these *data* for a population of 125,500, would be about the proportion of 30 deaths to every thousand living persons.\*

The lowest suburban mortality recorded in the fifth volume of the Registrar-General's Reports, for the year then under estimation, gave a rate of 11 in the thousand; and we might perhaps be justified in adopting that rate as a *minimum* for the purpose of sanitary comparison.

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\* The Census of 1851, compared with that of 1841, would lead me to believe that in 1848-9 the population of the City must have been about 129,000. With this correction, the death-rate would have been about 29.16 *per* thousand.—J. S., 1854.

According to this standard (undoubtedly a very superior one) it would appear that, during the last year, death has prevailed in the City of London with nearly three times its recognised *minimum* of severity.

But, to avoid all sources of fallacy, I will allow a very ample margin to this estimate; I will take 15 per thousand as a fair standard of mortality, and will assume that last year's deaths in the City have amounted to only double their normal proportion.

Probably no one contends that the lower rate of mortality, as illustrated at Dulwich or Sydenham, indicates an over-healthy condition of the locality to which it refers. Probably no one argues that human life, in those healthier districts, is prolonged beyond enviable limits. Surely, on the contrary, every one who can measure the large amount of misery and destitution which results from a high rate of mortality, will think it most desirable that, by every means within the scope of sanitary science, exertion should be made to reduce the higher rate to the level of the lower.

Therefore, Gentlemen, I venture to assure myself, that I shall but have anticipated the wishes of this Hon. Court, in preparing for your consideration a statement of those circumstances, which apparently conspire to determine the larger mortality of the City of London.

In order to prevent any misapprehension of my remarks, I think it well to observe that, in commenting on this mortality, I purposely avoid instituting any comparison between it and the mortality of those urban districts which immediately adjoin us: for the object of my comparison is not to illustrate how, by similar or worse circumstances, an equally great mortality may have been procured elsewhere;

but rather to suggest how, by other and better sanitary arrangements here, our present high mortality may be diminished.

Indeed, while I speak of the causes of that high mortality which distinguishes the City of London from the healthier sub-districts I have cited, it will be obvious that many of my observations do not apply to the City of London exclusively, but admit of equal application to various other central districts of the metropolis;—relating, in fact, generally to the characteristic evils of all urban residences.

With those other districts I have nothing to do; but I wish it to be understood, that in describing the City as healthy or unhealthy, I am not comparing it with Holborn, or Whitechapel, or Bermondsey, or other urban localities, where—whatever the relative badness of the places, the scale of comparison would be essentially vicious, and the results of comparison worthless. It is my object to test the salubrity of the City by comparison with a superior standard, in order that some definite aim may appear, towards which to direct the endeavours of sanitary improvement.

Starting, then, from our Registrars' Returns, I invite you to inquire with me, how it has come to pass that within the City of London there have died in the last year twice as many persons as it seems necessary that there should die; and whence has arisen the apparent anomaly, that here—in the very focus of civilization, where the resources of curative medicine are greatest, and all the appliances of charitable relief most effectual, still, notwithstanding these advantages, there has passed away irrevocably during the year so undue a proportion of human life.

Let it not be imagined that the word *cholera* is a sufficient answer to these questions, or that its mention can supersede the necessity for sanitary investigation. Let it, on the contrary, be observed that the epidemic which has visited us, extends its ravages only to localities previously and otherwise hostile to life; so that, while all regions of the globe in succession are shadowed by its dark transit, the healthiest districts of each region remain utterly unharmed in presence of the pestilence. Compare, for instance, the cholera mortality in a healthy suburban sub-district with that of an unhealthy urban one. Dulwich and the parish of St. Ann's, Blackfriars, in the City of London, are probably nearly equal in population: in the former, there was not a single death from cholera; in the latter, the deaths from this cause alone were at the rate of twenty-five to every thousand of the population. Dulwich is one of the healthiest sub-districts within the bills of mortality; St. Ann's belongs to one of the unhealthiest sub-districts of the City of London; and the cholera visited each in proportion to its ordinary healthiness.

Such is the general rule; and accordingly I would suggest to you that the presence of epidemic cholera, instead of serving to explain away the local inequalities of mortality, does, in fact, only constitute a most important additional testimony to the salubrity or insalubrity of a district, and renders more evident any disparity of condition which may previously have been overlooked. The frightful phenomenon of a periodic pestilence belongs only to defective sanitary arrangements; and, in comparing one local death-rate with another, it is requisite to remember that, in addition to the ordinary redundancy of deaths which marks an unhealthy district, there is a tendency from time to time to



the recurrence of epidemic pestilence, which visits all unhealthy districts disproportionately, and renders their annual excess of mortality still more egregious and glaring.

As materials which may aid you to estimate the sanitary defects of the City, I subjoin two tables\* illustrating the relative mortality of the several sub-districts. The first of these tables indicates numerically the local distribution of the year's deaths, and gives their proportion to the population of each district and sub-district. The second relates particularly to the last quarter, and illustrates the pressure of the epidemic. The two together furnish a synoptical view of the several rates of mortality, as calculated for the entire City, for the Unions separately, for the sub-districts separately, and for the last quarter of the year separately. In the tedious process of constructing these tables, I have been careful to avoid every source of inaccuracy, and believe that they present you with a true measure of the health of the City during the past year.

From these comparative tables it will be observed, that the high mortality of the population does not affect the entire City equally; that, in some of its portions, the rate of death approaches the *minimum* standard much more nearly than in others; that in those districts where the

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\* I have not reprinted these tables quite as here described. The local distribution of the 3763 deaths of the year is given in the Appendix, No. III.; and the sub-district death-rates of the year, as nearly as I can get them, in a note overleaf, page 6. The high mortality of this summer quarter (in which 1395 persons died) will be best appreciated by the reader in referring to Appendix, No. XIV.; where it can be compared with the mortality of similar periods of time in the four other years there accounted for.—J. S., 1854.

general rate is best, the temporary aggravation from epidemic causes has likewise been least; and that our aggregate City rate, either for ordinary times or for a period of epidemic disease, is compounded from the joint result of several very different proportions. Reference to the Registrar-General's tables will enable any one to see that the ordinary rate of mortality for the West London Union is a fourth higher than the rate for the City of London Union, while the rate for the East London Union bears a still higher proportion; and these very different rates are, as it were, merged in the one aggregate rate, struck for the whole City, as comprising the three unions referred to. It will be obvious, therefore, that many parts of the City are much healthier than this aggregate rate would signify, while others are much unhealthier. In regard of last year, for instance, the aggregate rate of mortality was (as I have stated) 30 per thousand of the general population of the City: but if this rate be analysed by examination of the sub-district mortality, it will be seen that in one sub-district the rate of death stood nearly as low as 20; that in another sub-district of the same union it rose to 36, and in a third sub-district (of another union) to within a small fraction of 40.\*

If it were possible to furnish you with statistics derived

\* On account of changes of population shown by the subsequent Census, these figures would require correction. The death-rates *per* thousand in the several sub-districts were probably about as follows, viz. :—

| EAST LONDON UNION. |              | W. L. UNION. |        | CITY OF LONDON UNION. |       |        |       |       |
|--------------------|--------------|--------------|--------|-----------------------|-------|--------|-------|-------|
| St. Botolph.       | Cripplegate. | North.       | South. | S. W.                 | N. W. | South. | S. E. | N. E. |
| 26½                | 32           | 34           | 41     | 33                    | 22    | 24     | 21¾   | 22    |

from a still smaller sub-division of each district, these points would be infinitely more manifest. In some limited localities of the City you would probably find an approximation to the average mortality of suburban districts; while in other spots, if they were isolated for your contemplation, you would see houses, courts, and streets where the habitual proportion of deaths is far beyond the heaviest pestilence-rate known for any metropolitan district aggregately—localities, indeed, where the habitual rate of death is more appalling than any which such averages can enable you to conceive.

These facts are quite unquestionable, and I have felt it my duty to bring them under your notice as pointedly and impressively as I can; feeling assured, as I do, that so soon as you are cognisant of them, every motive of humanity, no less than of economical prudence, must engage you to investigate with me, whether or not there may lie within your reach any adoptable measures for lessening this large expenditure of human life, and for relieving its attendant misery. It is, therefore, with the deepest feeling of responsibility that I proceed to fulfil the main object of my First Annual Report, by tracing these effects to their causes, and by explaining to you, from a year's observation and experience, what seem to me the chief influences prevailing against life within the City of London.

My remarks for this purpose will fall under the following heads, viz.:—

- I. Defective house-drainage ;
- II. Incomplete and insufficient water-supply ;

III. Offensive or injurious trades and occupations;

IV. Intramural burials ;

V. Houses insusceptible of ventilation, and absolutely unfit for habitation ;

VI. The personal habits of the lowest classes, and the influence of destitution in increasing their mortality.

In treating of these topics, I shall not pretend to bring before you all the details on which my opinions are founded, or to enumerate under each head those infinite individual instances which require sanitary correction. It is my wish at this time to submit to you only such general considerations as may show you the largeness of the subject, its various ramifications, and its pressing importance; and it is my hope that these considerations may suffice to convince you of the necessity which exists in the City of London for some effective and permanent sanitary organisation.

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## HOUSE-DRAINAGE.

I. It is not in my power to lay before you any numerical statement of the proportion of drained to undrained houses. From such information as I possess, I may venture to speak of imperfect house-drainage as having been a general evil in all the poorer districts of the City; and the latest intelligence on the subject leads me to consider this great evil as but very partially removed. So far as I can calculate from very imperfect materials, I should conjecture that some thousands of houses within the City still have cesspools connected with them. It requires little medical knowledge to understand that animals will scarcely thrive in an atmosphere of their own decomposing excrements; yet such, strictly and literally speaking, is the air which a very large proportion of the inhabitants of the City are condemned to breathe. Sometimes, happily for the inmates, the cesspool in which their ordure accumulates, lies at some small distance from the basement-area of the house, occupying the subsoil of an adjoining yard, or if the privy be a public one, of some open space exterior to the private premises. But in a very large number of cases, it lies actually within the four walls of the inhabited house; the latter reared over it, as a bell-glass over the beak of a retort, receiving and

sucking up incessantly the unspeakable abomination of its volatile contents. In some such instances, where the basement story of the house is tenanted, the cesspool lies—perhaps merely boarded over—close beneath the feet of a family of human beings, whom it surrounds uninterruptedly, whether they wake or sleep, with its fetid pollution and poison.

Now, here is a removable cause of death. These gases, which so many thousands of persons are daily inhaling, do not, it is true, in their diluted condition, suddenly extinguish life; but, though different in concentration, they are identically the same in nature with that confined sewer-gas which, on a recent occasion, at Pimlico, killed those who were exposed to it with the rapidity of a lightning stroke. In their diluted state, as they rise from so many cesspools, and taint the atmosphere of so many houses, they form a climate the most congenial for the multiplication of epidemic disorders, and operate beyond all known influences of their class in impairing the chances of life.

It may be taken as an axiom for the purposes of sanitary improvement, that every individual cesspool is hurtful to its vicinage; and it may hence be inferred how great an injury is done to the public health by their existence in such numbers, that parts of the City might be described as having a cesspool-city excavated beneath it.

I beg most earnestly to press on the consideration of your Hon. Court, the extreme importance of proceeding with all convenient speed to alter this very faulty construction, and to substitute for it an arrangement compatible with the health of the population.

While addressing you on this subject, and while congratulating your Hon. Court on the fact, that public attention is so much directed to a matter in which your exertions are certain to effect large and salutary reform, I cannot refrain from expressing a wish, that more accurate knowledge prevailed among the public as to the history and jurisdiction of the nuisance in question. It seems constantly to be forgotten, that your responsibility in the matter dates but from last January. The cesspool-nuisance has been the slow growth of other less enlightened ages, not in the City merely, but in the whole metropolis, and in all other towns in England. The extreme injury which it inflicts on the health of the population, and the vital necessity of abating that injury, are points which only began to claim attention in this country about ten years ago; and which have since but very slowly been forcing their way (chiefly through the indomitable zeal and perseverance of Mr. Chadwick) into that share of notice which they deserve. House-drainage with effective water-supply, are the remedies which can alone avail; and it is only during the present year that authority to enforce these measures has been vested by the Legislature in any public bodies whatsoever.

Before the month of January last, when your increased jurisdiction was established, it appears to me that, for the existence of cesspools in the City, you had no more responsibility than for the original site of the metropolis, or for the architecture of Westminster Abbey.

During the last ten months, however, the care of effective house-drainage has rested solely and entirely with your Hon. Court; for two of those ten months, I thought

it desirable, on account of the epidemic, that no considerable disturbance of the soil should take place in the construction of new works; in the remaining eight months, two miles of new sewer were formed, and 900 houses were drained for the first time.

If the house-drainage of the City had depended for its completion, even since that time, solely on the labours of this Commission, no doubt it would have proceeded at a far quicker pace. How effectively your Hon. Court had prepared for the best application of your increased powers, is sufficiently evinced in the 45 miles of sewerage, ramifying through all the districts of your jurisdiction, ready at every point to receive the streams of private drainage, and leaving to the owners of house-property (with few exceptions) no excuse for their non-performance of these necessary works. I believe the extent of public sewerage within the City to be quite unparalleled, and to furnish facilities of the rarest kind for the abolition of cesspools, and for the establishment of an improved system of house drainage. But, Gentlemen, while you have exerted yourselves to the utmost in the application of your increased authority, and have directed your staff of officers, from first to last, to proceed with all possible despatch in enforcing sanitary improvement in the matter now under consideration, the intentions of your Court and the industry of its officers have been in a great measure frustrated by the passive resistance of landlords. Delays and subterfuges have been had recourse to by the owners of house-property, in order to avoid compliance with the injunctions of the Commission; and the temporary interruption of works, which occurred in August



and September, prevented these evasions from being dealt with as otherwise they would have been.

Now, however, the course is again open. For some weeks your Hon. Court has directed that all works of drainage and sewerage shall proceed; many are already in progress; and I can see no reason why, within a year from the present time, the number of cesspools and of undrained houses within the City of London should not be reduced to a very small proportion.

Everything, however, in this respect will depend on the spirit of *thoroughness* with which the Act of Parliament is enforced; and I would strongly recommend, in all cases of non-drainage or other non-compliance with the terms of notice, that no indulgence whatever should be conceded to landlords beyond the time specified in the notification of the Court; that no difference should be recognised between a 'notice' and 'a peremptory notice;' that all notices should be 'peremptory;' and that, a certain period for performance having been allowed to the landlord, on the very day of that period's expiration, the work, if undone, should be given over for completion by the workmen of the Commissioners of Sewers, in accordance with the 61st clause of the Act of Parliament. In favour of the adoption of this principle, I can adduce no stronger argument than my conviction, that its non-adoption would insure a sacrifice of human life, in exact proportion to the procrastination allowed; and that, too, in a matter where henceforth your responsibility is undivided and your power absolute.

In order to give efficiency to whatever improvements of

house-drainage may be instituted, the present system of water-supply will require to undergo very extensive modifications; for at present in the poorer tenements, even where some show of house-drainage is made, the arrangements are constantly rendered inoperative from insufficiency or absence of water. To this matter, however, I shall presently revert.

Another most important *desideratum* in connexion with the sewerage of the City is that, if possible, some more perfect system of trapping should be devised, or that, in some way or other, the sewers should be ventilated effectively and inoffensively.\* At present there are frequent complaints of offensive exhalation from gratings in the open ways of the City; and it will be obvious to your Hon. Court, that all which I have urged on the subject of cesspool-exhalations must apply equally to those which are emitted from sewers. The impediments to effective trapping are almost insuperable; but I believe that when the water-supply of the City is very largely increased, washing the drains amply and incessantly, the evil complained of will undergo a sensible diminution.

In further connexion with my present subject, I would also solicit attention to the fact that the sanitary purposes of drainage are but imperfectly achieved, where the outfall of sewerage is into a tidal river passing through the heart of a densely peopled metropolis. I should be stepping

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\* This subject is adverted to, with more detail, in the next year's Report.—See page 104.

beyond my province, if I were to say much respecting the schemes now before the public for dealing with the difficulty to which I here refer, inasmuch as those schemes involve questions of engineering and machinery, on which I am incompetent to form an opinion. But I can have no hesitation in stating it as a matter greatly to be desired in the City of London, that the noble river which ebbs and flows beneath its dwellings should cease to be the drainpool of our vast metropolis; and that the immeasurable filth which now pollutes the stream should be intercepted in its course, and be conveyed to some distant destination, where instead of breeding sickness and mortality, it might become a source of agricultural increase and national wealth.\*

I would venture, likewise, to express an opinion that the City of London is peculiarly interested in the accomplishment of this great public work, not only on general grounds relating to the conservancy of the river, but likewise and especially on sanitary grounds, by reason of the large bank-side population, subjects of the City, who now, instead of deriving advantage from their nearness to the stream, are constantly disgusted and injured by its misuse.

While the consideration of this most important measure is pending, I would invite attention to some circumstances, by which even the present evil is needlessly aggravated.

In the first place the sewers are of defective length, so that during the ebb of the tide their contents, as they escape, are suffered to flow in a stream of some length

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\* This subject is more particularly dwelt upon in the last Report; page 261.

across the mud of the retreating river. The stream, together with the mud which it saturates, and the open mouth of the sewer, evolve copious and offensive exhalations, and I would recommend that measures be taken for abatement of the nuisance. This purpose, as concerns the sewer, would be fulfilled by the addition, in each instance, of a sufficient length of brick or cast-iron work, to prolong the canal beyond low water mark; but the great extent of mud which is left uncovered at each tide; and which during the present pollution of the river is a source of extreme nuisance and of disease, constitutes an evil for which no remedy can be found till the stream shall be narrowed and embanked.

Meanwhile, the complaints which reached the Committee of Health during the summer, together with the results of my own inspection, lead me to believe that the several small docks which lie along the City bank of the river from the Tower to the Temple, fulfil little really useful purpose; that they are to a great extent used as laystalls for their vicinage; that copious deposits and accumulations of filth take place in them; that they are a nuisance and injury, except to the very few who are interested in their maintenance; and that it would be of public advantage that they should be filled up.

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## WATER-SUPPLY.

II. I am sure that I do not exaggerate the sanitary importance of water, when I affirm that its unrestricted supply is the first essential of decency, of comfort, and of health ; that no civilization of the poorer classes can exist without it; and that any limitation to its use in the metropolis is a barrier, which must maintain thousands in a state of the most unwholesome filth and degradation.

In the City of London the supply of water is but a fraction of what it should be. Thousands of the population have no supply of it to the houses where they dwell. For their possession of this first necessary of social life, such persons wholly depend on their power of attending at some fixed hour of the day, pail in hand, beside the nearest standcock ; where, with their neighbours, they wait their turn—sometimes not without a struggle, during the tedious dribbling of a single small pipe. Sometimes there is a partial improvement on this plan; a group of houses will have a butt or cistern for the common use of some scores of inmates, who thus are saved the necessity of waiting at a standcock, but who still remain most insufficiently supplied with water. Next in the scale of improvement we find water-pipes laid on to the houses ; but the water is turned on only for a few hours in the week, so that all who care

to be adequately supplied with it must be provided with very spacious receptacles. Receptacles are sometimes provided: and in these, which are often of the most objectionable description, water is retained for the purposes of diet and washing, during a period which varies from twenty-four to seventy-two hours. One of the most important purposes of a water-supply seems almost wholly abandoned—that, namely, of having a large quantity daily devoted to cleanse and clear the house-drains and sewers; and in many cases where a waste-pipe has been conducted from the water-butt to the privy, the arrangement is one which gives to the drainage little advantage of water, while it communicates to the water a well-marked flavour of drainage.

I consider the system of intermittent water-supply to be radically bad; not only because it is a system of stint in what ought to be lavishly bestowed, but also because of the necessity which it creates that large and extensive receptacles should be provided, and because of the liability to contamination incurred by water which has to be retained often during a considerable period. In inspecting the courts and alleys of the City, one constantly sees butts, for the reception of water, either public, or in the open yards of the houses, or sometimes in their cellars; and these butts, dirty, mouldering, and coverless; receiving soot and all other impurities from the air; absorbing stench from the adjacent cesspool; inviting filth from insects, vermin, sparrows, cats, and children; their contents often augmented through a rain water-pipe by the washings of the roof, and every hour becoming fustier and more offensive. Nothing

can be less like what water should be than the fluid obtained under such circumstances; and one hardly knows whether this arrangement can be considered preferable to the precarious chance of scuffling or dawdling at a standcock. It may be doubted, too, whether, even in a far better class of houses, the tenants' water-supply can be pronounced good. The cisternage is better, and all arrangements connected with it are generally such as to protect it from the grosser impurities which defile the water-butts of the poor; but the long retention of water in leaden cisterns impairs its fitness for drinking; and the quantity which any moderate cistern will contain is very generally insufficient for the legitimate requirements of the house during the intervals of supply. Every one who is personally familiar with the working of this system of intermittent supply, can testify to its inconvenience; and though its evils press with immeasurably greater severity on the poor than on the rich, yet the latter are by no means without experience on the subject.

The following are the chief conditions in respect of water supply, which peremptorily require to be fulfilled:—

1. That every house should be separately supplied with water, and that where the house is a lodging-house, or where the several floors are let as separate tenements, the supply of water should extend to each inhabited floor.

2. That every privy should have a supply of water, applicable as often as it may be required, and sufficient in volume to effect, at each application, a thorough flushing and purification of the discharge-pipe of the privy.

3. That in every court, at the point remotest from the

sewer-grating, there should be a standcock for the cleansing of the court; and

4. That at all these points there should always and uninterruptedly be a sufficiency of water to fulfil all reasonable requirements of the population.

Now, if my statements are accurate with regard to the imperfect manner in which thousands participate in the distribution of water, even for their personal necessities; if my statements are again accurate with respect to house-drainage, and to the immense increase of water distribution which must accompany any improvement in this respect—and I am quite prepared, if necessary, to adduce ample evidence on these subjects; if, again, it be considered that the appreciation of water by the multitude, who have so long suffered from lack of it, will lead to a vast augmentation of its domestic use; then, I apprehend, it cannot be doubted that the subject of water-supply to the City is one that requires now to be looked at almost as though it were to-day broached for the first time.

Those important conditions, which I just enumerated as urgently requiring fulfilment, may certainly be accomplished, so far as mechanical construction is concerned, in more than one way. It may be possible, no doubt, in further compliance with the principle of intermittent supply, to furnish every tenement in the City with a cistern of proper dimensions, and with its usual appurtenances of ballcock, waste-pipe, &c.; but this, I need hardly say, would be a process involving a vast expenditure of money, and hardly to be recommended on the mere ground of conformity with what has hitherto been done in the matter. It may be possible,



on the other hand, to convert the whole water-supply of the City into a system of uninterrupted supply, and to construct all new works in conformity with this system.

I beg to suggest that the choice between these alternatives is one of immense and very urgent importance to the sanitary welfare of the City; and I would earnestly commend it to the best consideration of your Hon. Court.

The system of a constant supply is now no longer a novelty. In Philadelphia, in New York, in Nottingham, in Preston, in Glasgow, in Newcastle, in Bristol, and in various other places, this system has been adopted; its practicability and its advantages have been amply demonstrated.\* Five years ago, when evidence on the subject was given before the House of Commons, it appeared that in the city and suburbs of Philadelphia 25,816 houses were supplied at an average rate of five dollars per house; that in Preston more than 5,000 houses were supplied continually at high-pressure, and that the company was increasing its tenants at the rate of 400 annually; that in Nottingham about 8,000 houses, containing a population of 35,000 persons, were

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\* It seems almost unnecessary to remind the reader that five more years have added infinite additional testimony to that mentioned in the text as existing in 1849; and that, two years ago, in a special Act of Parliament, it was enjoined on the Water Companies of the Metropolis that, within seven years, they should follow the precedent so extensively established. In the face of such evidence—with the knowledge that Manchester has a constant supply and that Glasgow is arranging one, it certainly tests one's credulity to hear it rumoured that our Metropolitan Water-Merchants are hoping to resist that requirement, on the ground that such a supply in London would be *impossible*.—J. S., 1854.

supplied in the same manner; and in respect of many other towns, public experience has been equally extensive and satisfactory. About a month ago, the Sanitary Committee of the last-mentioned town published what I may call a report of congratulation on their freedom from cholera, which had visited the town with great severity in 1832. They detail the measures by which Nottingham has been rendered a healthy town, and the first item in that enumeration stands thus:—‘An unlimited supply of wholesome filtered water, forced, by day and night, at high pressure, through all the streets to the tops of almost all the houses, at a cost, for the dwellings of the poor, of about five shillings per week.’

On the relative merits or demerits of the two competing systems of supply, I have only to speak so far as their adaptation to sanitary purposes is concerned. In this respect, I have no hesitation in saying that the system of constant supply is immeasurably superior to its rival; so superior, that unless competent engineering authorities should decide on its practical inapplicability to the City of London, I would strongly recommend its adoption as the only one, in my judgment, by which the growing necessities of the population can be fully and effectively satisfied.

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## OFFENSIVE AND INJURIOUS TRADES.

III. With respect to offensive trades and occupations pursued within the city of London, my task of recommendation is an easy one. To any person conversant with the simplest physiological relations of cause and effect, it is quite notorious that the decomposition of organic matter within a certain distance of human habitations unfailingly tends to produce disease; and every one who is competent by knowledge and impartiality to pronounce an opinion on the subject, must feel that no occupation which ordinarily leaves a putrid refuse, nor any which consists in the conversion or manufacture of putrescent material, ought, under any circumstances, to be tolerated within a town.

1. First, in regard to slaughter-houses, I may remind you that, on the 23rd of January last, when your Hon. Commission first met under the new Act of Parliament, I recommended to you on sanitary grounds, that in such rules as you might make for the regulation of slaughter houses, all underground slaughtering should be absolutely prohibited. It was laid down, however, that your Act of Parliament would not enable you to establish this restriction, which (it was argued) would be equivalent to a direct suppression of many existing slaughter-houses.\*

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\* Slaughtering in cellars was rendered illegal by the amended City Sewers Act, 1851, and since that year has been entirely discontinued in the City. See page 192.—J. S., 1854.

Considering that, in my first recommendations to the Commission I ought to confine myself to objects attainable by means of the Act of Parliament then just coming into operation, I felt myself precluded for the time from entering on the subject (however important in itself) of the total abolition of urban slaughtering. Now, however, while treating generally of sanitary improvement for the City, I can have no hesitation in repeating an opinion which I have already submitted to the Health-Committee of the Common Council; and I beg accordingly to state, that I consider slaughtering within the City as both directly and indirectly prejudicial to the health of the population;—*directly*, because it loads the air with effluvia of decomposing animal matter, not only in the immediate vicinity of each slaughter-house, but likewise along the line of drainage which conveys away its washings and fluid filth; *indirectly*, because many very offensive and noxious trades are in close dependence on the slaughtering of cattle, and round about the original nuisance of the slaughter-house, within as narrow limits of distance as circumstances allow, you invariably find established the concomitant and still more grievous nuisances of gut-spinning, tripe-dressing, bone-boiling, tallow-melting, paunch-cooking, &c. Ready illustrations of this fact may be found in the gut-scraping sheds of Harrow-alley, adjoining Butchers'-row, Aldgate; or in the Leadenhall skin-market, contiguous to the slaughtering places, where the stinking hides of cattle lie for many hours together, spread out over a large area of ground, waiting for sale, to the great offence of the neighbourhood.

Such evils as those to which I have adverted are inseparable from the process of slaughtering, however carefully

and cleanly conducted; and they may easily be aggravated to an unlimited extent by defects in drainage, in water supply, or in ventilation, or by the slovenly habits and impunctuality of those to whom the removal of filth and offal is intrusted.

In short, I believe it to be quite impossible, so to conduct the process of slaughtering within the City of London as to remove it from the category of nuisances, or to render it harmless to the health of the population; and I believe it to be equally impossible so to superintend the details of its performance as to prevent them, where ill-administered, from rising into considerable and fatal importance among the promoting causes of epidemic and infectious disease.

It is scarcely necessary, after this expression of my opinion, that I should say how strongly I would recommend that measures should be taken for the discontinuance of all slaughtering within the City; and that, with the abolition of slaughtering, all establishments which deal with animal matter approaching putrefaction, and all sheds and stalls for the continued keeping of cattle, should likewise be prohibited and suppressed.

The number of slaughter-houses at present registered and tolerated within the City amounts to 138, and in 58 of these the slaughtering occurs in vaults and cellars. How overwhelming an amount of organic decomposition must be furnished by these establishments, can neither be estimated nor conceived; but the influence of that decomposition admits of being measured in its effects on the population, and in the high zymotic mortality which denotes an atmosphere over-laden with organic poison.

Before leaving this subject, I think it right very briefly to allude to an argument which is often objected to the view here stated. The objector looks to a particular district, or to a particular slaughter-house, and says that the mortality of the district is an average one; or he points to Mr. A. or Mr. B.—the butcher or the butcher's man, saying, 'Who can be healthier than A. or B.? Surely, if the pursuit be injurious, these men ought to have been poisoned long ago.' Now, to this I reply;—first, as regards the men employed in these crafts, we have no statistics of any value to decide on their mortality, and judgment on the matter cannot be deduced from some half-dozen cases, known to any of us individually; but, further, if we admit (which I by no means know to be the case) that they are persons of average longevity and healthiness, then it must be remembered that their activity, their out-door exercise, and, above all, their unlimited supply of animal food, are circumstances conducing to give them health beyond the average of their station; and it must be remembered that these palliating circumstances, though they may counteract the evil for those persons most nearly concerned in it, contribute nothing towards deodorising the neighbourhood, or towards preserving its poorer inhabitants from the depressive influence of putrid emanations.

And, as regards the district—although we have certain evidence that organic decomposition is a chief cause of disease, yet we do not invariably find disease generated in immediate proximity to the source of nuisance. Drainage beneath the soil, and currents of air above it, convey the materials of decomposition to a distance; and if the particular slaughter-houses be placed on a high level amidst the

surrounding City, so that their drainage be effectual and their ventilation complete, then obviously their influence must be sought for, not so much in any special aggravation of the local mortality, as in certain remoter effects of their diffused emanation; in effects, namely, which are discoverable along their lines of drainage and ventilation, and in the various consequences of a highly zymotic atmosphere generally through the entire town.

2. With regard to such trades as are considered to be simply offensive, and where the evidence of injury to health is indirect and uncertain, I can hardly doubt that a wise legislation would exclude them also from the circle of the metropolis. Tallow-melting, whalebone-boiling, gas-making, and various other chemical proceedings, if not absolutely injurious to life, are nuisances, at least in the ordinary language of the law, or are apt to become such. It is the common right of the neighbourhood to breathe an uncontaminated atmosphere; and, with this common right, such nuisances must, in their several degrees, be considered to clash. It might be an infraction of personal liberty to interfere with a proprietor's right to make offensive smells within the limits of his own tenement, and for his own separate inhalation; but surely it is a still greater infraction of personal liberty when the proprietor, entitled as he is to but the joint use of an atmosphere which is the common property of his neighbourhood, assumes what is equivalent to a sole possession of it, and claims the right of diffusing through it some nauseous effluvium which others, equally with himself, are thus obliged to inhale. Such, as it appears to me, is the rational view of this matter; and although I am

not prepared to speak of these trades in the same terms as I applied to slaughtering and its kindred occupations,—although, that is to say, I cannot speak of them as injurious to health on any large scale, yet I would respectfully submit to your Hon. Court that your Act of Parliament empowers you to deal with such nuisances in respect of their being simply offensive.\*

3. Under the same head, I would likewise beg leave to suggest whether it might not be practicable for your Hon. Court to regulate the operation of establishments which evolve large volumes of smoke. The exterior dirtiness and dinginess of London depend mainly on this cause; and the same influence, by rendering domestic cleanliness difficult and expensive, creates an additional impediment to its cultivation. People naturally despair of cleansing that which a day's exposure to the atmosphere blackens again with soot; or they keep their windows shut, breathing a fusty and unwholesome air, in the hope of excluding the inconvenience. Now, when it is remembered that all the smoke of London is but so much wasted fuel, it must surely be felt that the enforcement of measures for its consumption would be to the interest of all parties; amply economizing to the manufacturer whatever might be the trifling expense of appropriate arrangements, while it would relieve the public of that which, called by the mildest name, is a nuisance and a source of heavy expense.

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\* City Sewers Act, 1848, § 113.



## INTRAMURAL BURIAL.

IV. The subject of intramural burial is the next on which I have to report, as affecting the health of the City.

In compliance with an order of the Health Committee, I have examined as fully as circumstances would allow into the requirements of the City of London in respect of burial accommodation, and the result of my inquiry obliges me to express my conviction, that the City can no longer with safety or propriety be allowed to furnish intramural interment to its dead.

In all those larger parochial burying-grounds where the maintenance of a right to bury can be considered important,—in all such, and in most others, too, the soil is saturated and super-saturated with animal matter undergoing slow decomposition. There are, indeed, few of the older burial-grounds of the City where the soil does not rise many feet above its original level, testifying to the large amount of animal matter which rots beneath the surface. The vaults beneath churches are, in many instances, similarly overloaded with materials of putrefaction, and the atmosphere, which should be kept pure, and without admixture for the living, is hourly tainted with the fetid emanations of the dead. For the most part, houses are seen to rise on all sides in immediate contiguity to the burial-ground, forbidding the possibility of even such ventilation as might diminish the evil; and the inhabitants of such houses com-

plain bitterly, as they well may, of the inconvenience which they suffer from this confined and noxious atmosphere.

With respect to burial in vaults, which prevails to a very great and dangerous extent in this City, I may observe that, among persons who are ill-informed on the subject, there exist erroneous notions as to the preservation of bodies under these circumstances. They are supposed, from the complete closure of their coffins, to remain unchanged for ages, like the embalmed bodies of Egypt and Peru; or at least—if perhaps they undergo some interior and invisible change (as the chrysalis within its sheath) that there is no interference with the general arrangement, no breach in the compactness of the envelope. Nothing can be less correct than this supposition.

It is unnecessary that I should detail to you the process of decay, as it occurs within the charnel-house; nor need I inquire for your information whether indeed it be true, as alleged, that part of the duty of a sexton consists in tapping the recent coffins, so as to facilitate the escape of gases which otherwise would detonate from their confinement. It is sufficient to state, that—whether such be or be not the duty of the functionary in question, the time certainly comes, sooner or later, when every corpse buried in the vault of a church spreads the products of its decomposition through the air as freely as though no shell had enclosed it. It is matter of the utmost notoriety that, under all ordinary conditions of vault-sepulture, the wooden case of the coffin speedily decays and crumbles, while the interior leaden one, bending with the pressure of whatever mass may be above it (or often with its own weight) yields, bulges, and bursts, as

surely as would a paper hat-box under the weight of a laden portmanteau.

If the accuracy of this description be doubted, let inquiry be made on a large scale after the coffins of 40 years back\*—let it be seen how many will appear! If, on the contrary, its accuracy be granted, then I apprehend nothing further need be urged, to establish the importance of abolishing a system which maintains on so large a scale the open putrefaction of human remains within places of frequent resort, and in the midst of populous habitations.

It is a very serious matter for consideration, that close beneath the feet of those who attend the services of their church, there often lies an almost solid pile of decomposing human remains, co-extensive with the area of the building, heaped as high as the vaulting will permit, and generally (as I have shown) but very partially confined. And if it be the case, as perhaps it may be, that the frequenters of the place of worship do not complain of any vitiation of their atmosphere, or perhaps do not experience it, not the less is it true that such a vitiation occurs, and—whether to the special detriment of the congregation or not, contributes to the overladen putrefactiveness of our London atmosphere.

In respect of such vaults, I do not consider that the

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\* Perhaps the expressions in my text are somewhat too general; not indeed as to the fact of the coffins *ultimately* giving vent to their fœtid contents (which is the real point at issue) but as to the time within which this occurs. In the dryer and better kept vaults, a longer period certainly elapses than that suggested; in the worse, probably a shorter one. The sooner or later is of little practical importance: but, on re-perusing my Report, I think it right to add this qualification.—J. S., 1854.

mere cessation of burial in them will be sufficient; seeing that at the present moment they contain amongst them many thousand coffins, as yet tenanted by the materials of decomposition; and year after year, if left in their present state, these will be poisoning the air with successive instalments of their progressive decay. It seems to me quite indispensable that some comprehensive measure should be undertaken, for abolishing at once and for ever all burial within the City of London. Conjointly with the general application to Parliament, for prohibition of further intramural sepulture, I would recommend that authority be obtained by the City for its several parishes to procure the decent removal to extramural cemeteries of such coffins as already occupy their vaults; or, failing this measure, I would recommend that all coffins now lying within vaults, be walled up in their present resting-places with uniform impermeable masonry. For very obvious reasons, I should prefer the former plan to the latter.\*

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\* Probably the most successful attempt at hermetical enclosure of organic matters would not reach beyond effecting a postponement of their diffusion through the atmosphere. The true principles for burial of the dead lie rather in recognising their decomposition as inevitable, and in providing only lest it be offensive or injurious to the living. This is best attained by interment in a well-chosen soil, at a depth proportioned to the qualities of the ground; with no pretence of everlasting coffins and impenetrable cerements; but with ample vegetation above, to relieve the upper earth from whatever products of decay may mount and mingle there; and especially with thorough drainage below, so that down-currents of air and rainfall may freely traverse the putrefactive strata, ventilating and washing the soil, and diffusing its organic contents through deeper levels, till their oxidation is complete and their new inodorous combinations are discharged in watery solution.—J. S., 1854.

Intramural burial is an evil, no doubt, that varies in its intensity according to the numbers interred; becoming appreciable in its effects on health, so far as the rough measure of statistics can inform us, only when many interments occur annually, or when ground is disturbed wherein much animal matter had previously been left to decay. But, be the evil large or little in any particular case, evil undoubtedly it is in all, and an unmitigated evil.

The atmosphere in which epidemic and infectious diseases most readily diffuse their poison and multiply their victims is one, as I have already often stated, in which organic matters are undergoing decomposition. Whence these may be derived signifies little. Whether the matter passing into decay be an accumulation of soaking straw and cabbage leaves in some miserable cellar, or the garbage of a slaughter-house, or an overflowing cesspool, or dead dogs floated at high water into the mouth of a sewer, or stinking fish thrown overboard in Billingsgate-dock, or the remains of human corpses undergoing their last chemical changes in consecrated earth, the previous history of the decomposed material is of no moment whatever. The pathologist knows no difference of operation between one decaying substance and another; so soon as he recognises organic matter undergoing decomposition, so soon he recognises the most fertile soil for the increase of epidemic diseases; and I may state with certainty, that there are many churchyards in the City of London where every spadeful of soil turned up in burial sensibly adds to the amount of animal decomposition which advances too often inevitably around us.

Nor can I refrain from adding, as a matter claiming attention, that, in the performance of intramural interment, there constantly occur disgusting incidents dependent on overcrowdedness of the burial-ground; incidents which convert the extremest solemnity of religion into an occasion for sickness or horror; perhaps mingling with the ritual of the Church some clamour of gravediggers who have mis-calculated their space; perhaps diffusing amidst the mourners some nauseous evidence and conviction, that a prior tenant of the tomb has been prematurely displaced, or that the spade has impatiently anticipated the slower dismembering of decay. Cases of this nature are fresh in the memory of the public; cases of extreme nuisance and brutal desecration in place of decent and solemn interment; and it is unnecessary that I should revive the record of transactions inconsistent with even the dawn of civilisation.\*

From the circumstances which I have mentioned, it can hardly fail to appear most desirable to you, that the use of some spacious and open cemetery at a distance from the City should be substituted for the present system of intramural interment, and the urgency of this requirement will be demonstrated all the more cogently, when it is remembered that the annual amount of mortality in the City averages above 3000, and that under the present arrangements every dead body buried within our walls receives its

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\* It happened that during the few months preceding the presentation of this Report, there had occurred some of the most flagrant and disgusting illustrations of the evils adverted to.—J. S., 1854.

accommodation at the expense of the living, and to their great detriment.

In recommending that consideration be given, at as early a period as possible, to the means for establishing some sufficient municipal cemetery (a consideration which, for obvious reasons, must be prior to any Parliamentary proceedings for the prohibition of intramural interments) there are three points to which, even now, I think it advisable to advert, as essential to the admissibility of such a plan. I would submit, first, that the site of any such cemetery must be sufficiently remote from the metropolis to obviate any repetition of the present injury to a resident population; and I hardly know how this purpose can be attained, without going some distance beyond the immediate suburbs of London as indicated by the Bills of Mortality:—secondly, that the space required for the proper inhumation of the dead of the City of London\* would be not less than 54 acres; and, thirdly, I would suggest that the charter of such an establishment ought to contain provisions against the erection of houses within a certain distance of the burial-ground, so that this may at all times and under all circumstances be surrounded, exterior to its wall, by a considerable belt of land totally devoid of resident population. The absence of such a provision as the last would very soon lead to the extramural cemetery becoming *intramuralised* by the growth of a new suburb around it, and would again evince, by new and unnecessary illustrations, how incompatible with each other are the Dead and the Living as tenants of one locality.

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\* See Special Report on Extramural Interment, page 285.

## HOUSES PERMANENTLY UNFIT FOR HABITATION.

V. Under the last heads of my Report I have touched on matters, which (in so far as they cannot be adjusted without Parliamentary interference) may be considered to lie beyond the present jurisdiction of the Commissioners of Sewers; and the topic which I now approach may, perhaps, be considered equally foreign to the scope of your ordinary functions.

I have to report that there are houses and localities within the City which are irremediably bad;—places, which the uninterrupted presence of epidemic disease has stamped as absolutely unfit for human habitation; places, where drainage and water-supply, indeed, are defective, but where the perfection of these necessaries might exist, in all probability, without giving healthiness to the inhabitants. The predominant evil in the localities referred to is their thorough impossibility of ventilation.

While treating of the manner in which noxious emanations are conveyed to a distance, and are enabled to diffuse their influence over a whole town, instead of concentrating it in some single slaughter-house or burial-ground, I indirectly suggested what I have now to illustrate; that all the evils of all the nuisances in existence acquire their utmost local intensity of action when the diffusion of their gaseous products is interfered with, and when, from absence of ventila-



tion, these are retained in the immediate vicinity of their source.

The inhabitants of open streets can hardly conceive the complicated turnings, the narrow inlets, the close parallels of houses, and the high barriers of light and air, which are the common characteristics of our courts and alleys, and which give an additional noxiousness even to their cesspools and their filth. There are very few who, without personal verification, would credit an account that might be given of the worst of such dwelling-places. Let any one, however, who would do full justice to this frightful subject, visit the courts about Bishopsgate, Aldgate, and the upper portion of Cripplegate, which present some of the worst, though by no means the only instances of pestilential residence. A man of ordinary dimensions almost hesitates, lest he should immovably wedge himself, with whomsoever he may meet, in the low and narrow crevice which is called the entrance to some such court or alley; and, having passed that ordeal, he finds himself as in a well, with little light, with less ventilation, amid a dense population of human beings, with an atmosphere hardly respirable from its closeness and pollution. The stranger, during his visit, feels his breathing constrained, as though he were in a diving-bell; and experiences afterwards a sensible and immediate relief as he emerges again into the comparatively open street.

Now, I am prepared to show that there are many, very many, courts within the City, to which the above description accurately applies; courts and alleys hemmed in on all sides by higher houses; having no possibility of any current

of air; and (worst of all) sometimes so constructed back to back, as to forbid the advantage of double windows or back doors, and thus to render the house as perfectly a *cul-de-sac* out of the court, as the court is a *cul-de-sac* out of the next thoroughfare.

It is surely superfluous to observe, that these local conditions are utterly incompatible with health. Among their dense population, it is rare to see any other appearance than that of squalid sickness and misery; and the children, who are reproduced with the fertility of a rabbit-warren, perish in early infancy. In the worst localities probably not more than half the children born survive their fifth year, and of the 3763 deaths registered last year in the City of London generally, 1410 were at or under seven years of age.

The diseases of these localities are well marked. Scrofula more or less completely blights all that are born: often extinguishing life prematurely; in childhood, by hydrocephalus; in youth, by pulmonary and renal affections, which you read of as consumption and dropsy; often scarring and maiming where it does not kill, and rendering life miserable by blindness, decrepitude, or deformity; often prolonging itself as a hereditary curse in the misbegotten offspring of those who, under such unnatural conditions, attain to maturity and procreation.

Typhus prevails there too, not as an occasional visitor, but as an habitual pestilence.

It is impossible for me, by numbers, to give you an exact knowledge of the fatality of such spots; because, in the greater part of the City, hospitals, dispensaries, and private

practice, divide with the parochial officers the treatment of the sick, and diminish the returns of sickness which those officers would otherwise have to show. But this I may tell you, as an illustration of what I mean;—that in the few houses of Seven-Step-alley and its two offsets, (Amelia-place and Turner-square,) there occurred last year 163 parochial cases of fever; in Prince's-place and Prince's-square, 176 cases—think, Gentlemen, if this had occurred in Southampton-place and Russell-square! that behind the east side of Bishopsgate, in the very small distance from Widegate-street to New-street, there were 126 cases; that behind the west side, from Primrose-street to Half-moon-street, there were 245 cases; that the parish of Cripplegate had 354 cases over and above the number (probably a very large one) treated by private practitioners, by hospitals, and especially by dispensaries. Similarly, though with less perfect information, I am enabled to trace fever to a terrible extent in very many other localities of the City, even on the verge of its better residences, and close behind its wealthiest thoroughfares; in Plumtree-court, in Plough-court and place, in Poppin's-court, Neville's-court, Blackhorse-alley, Union-court, Plough-court in Holborn, Field-lane; in the courts right and left of King-street, Smithfield, in Hanging-sword-alley and its vicinity, in Peahen-court, in Bell-alley and its neighbourhood, in Priest's-alley, in Beer-lane, in Friar's-alley, in Bromley's-buildings, and in the whole large space which stretches from Ludgate-hill to beside the river.

And in most of these localities, in addition to other sanitary errors, there predominates that particular one to

which I am now inviting your attention—the absence, namely, of sufficient ventilation.

It was in districts such as these, that in the year 1665, the Great Plague of London found the readiest facilities for its reception; and it was by the destruction of such districts that the Great Fire of the following year rendered the utmost conceivable service to the sanitary progress of the people, and completed their emancipation from the horrors of an unparalleled pestilence. Long intervening years have sufficed to reconstruct these miserable habitations almost after their first type, and to re-exemplify all the evils which belong to them; so completely indeed, that if the infection of that same plague should light again amongst us, I scarcely know why it might not traverse the City and decimate its population as quickly and as virulently as before. Meanwhile, however, typhus with its kindred disorders, and the occasional epidemics of influenza and cholera, maintain their attachment to the soil, and require no further re-inforcement from the pestilence of other climates. From these fatal diseases we no longer hope to be rescued by the recurrence of the former casualty. The almost two centuries which have elapsed since the period referred to, have taught men better methods than a general conflagration for remedying such evils; and it is a satisfaction to believe that the wisdom and humanity of the Corporation of the City of London will apply those methods with effect.

As a palliative measure, applicable in many of the least aggravated instances, I may suggest the removal of unnecessary walls which intercept the current of air from place to place; the formation of counter-openings in various

blind courts; and, not least, in regard of many houses thus situated, the admission of light and air by additional windows. I cannot pass this portion of the subject without recording my opinion that the operation of the window-tax is in direct opposition to the sanitary interests of the people; and I must venture to express my hope that some different method of assessment may presently be adopted, in place of one which presses on the occupier in proportion to the healthiness of his tenement.\* I think it very desirable, indeed almost indispensable, that your Hon. Court should have the power, under certain circumstances, to order and enforce the opening of additional windows in houses occupied by large numbers of persons, when your Officer of Health may report their ventilation defective; and if it should seem expedient to you to seek this authority from the Legislature, it might with the greatest advantage be accompanied by some concession from her Majesty's Government, to the effect that the formation of additional windows, occurring thus under your orders for the immediate necessities of health and life, should not occasion any further assessment on the occupiers of the house.

But, Gentlemen, within the City of London there exist, to a very large extent, architectural evils for which no such

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\* I ought not to pass this page without a grateful mention of Lord Duncan's name in connexion with the removal of the Window Tax, at length happily effected. It remains, however, greatly to be desired, in respect of certain specifiable houses inhabited by the poorer classes, that Local Boards of Health should have power to enforce improvements of ventilation.—J. S., 1854.

palliative treatment is possible; evils against which I would venture to say (borrowing a metaphor from my profession) that no safety can be found except in amputation.

To dwell in hovels like pits, low-sunken between high houses, hemmed in by barriers which exclude every breath of direct ventilation—this can never be otherwise than a cause of sickness and mortality to those whose necessities allot them such residence; and, if it be an incontrovertible fact that subsistence in closed courts is an unhealthy and short-lived subsistence in comparison with that of the dwellers in open streets, then, I apprehend, it cannot be doubted that such a manner of life ought to be dealt with as a great evil, and ought as much as possible to be interrupted.

A surveyor's inspection of the City would reveal to you many places answering to the description I have given; places to which no ventilation could arrive except by removal of whole streets of houses which wall them in.

To remove the well-constructed houses of the City, in order that its wretched courts and alleys should participate in the blessings of light and air, might seem one method of conquering the difficulty which is before you; but I apprehend the opposite alternative, of proceeding to a gradual suppression of all residence in the former class of dwellings, may more naturally have your approbation.

To the latter aim, sooner or later, the sanitary efforts of the Corporation must be directed.

There are many parts of the City where great and immediate advantage would arise from an expenditure of money applied solely to the purpose of destruction; parts, where the purchase of an entire court, or series of courts, for the sole object of pulling down houses, and leaving

open spaces in their stead, would be the cheapest as well as the most effective manner of dealing with their sanitary difficulties. And I have earnestly to suggest for your consideration, that proceedings of this nature will require to be pursued to a very great extent, and at a large annual expense, within the City, before the cleanliness and habitability of its poorer localities will stand in their legitimate proportion to the modern stateliness of thoroughfare and grandeur of public buildings which attest the magnificence of the Corporation.

I would, therefore, beg to recommend that a survey be made of the worst districts which I have specified, with a view to the immediate purchase and destruction of some considerable portion of the court-property lying in them; and, still more, I would urge that this is an exertion, which for some years must proceed systematically, in order to thin the density of a population which now breeds pestilence and augments mortality by its overcrowding and excess.

I am aware that considerable difficulties lie in the way of accomplishing an object of this sort with immediate rapidity. It is my great hope, however, that the principle may be distinctly recognised; and that the City will not tolerate within its municipal jurisdiction the continuance of houses absolutely incompatible with healthy habitation. This principle being once established, and a certain annual expenditure devoted to enforce it, I feel assured that within a few years opportunities will have arisen for that outlay to have been made in the most judicious manner, and for its results amply to have demonstrated the advantages of the system which I recommend.

## SOCIAL CONDITION OF THE POOR.

VI. Last, and not least, among the influences prejudicial to health in the City of London, as elsewhere, must be reckoned the social condition of the lower classes; and I refer to this the more especially, because often, in discussion of sanitary subjects before your Hon. Court, the filthy, or slovenly, or improvident, or destructive, or intemperate, or dishonest habits of these classes, are cited as an explanation of the inefficiency of measures designed for their advantage. It is constantly urged, that to bring improved domestic arrangements within the reach of such persons is a waste and a folly; that if you give them a coal-scuttle, a washing-basin, and a watercloset, these several utensils will be applied indifferently to the purposes of each other, or one to the purposes of all; and that meanwhile the objects of your charitable solicitude will remain in the same unredeemed lowness and misery as before. Now it is unquestionable, and I admit it,—that in houses containing all the sanitary evils which I have enumerated—undrained, and waterless, and unventilated—there do dwell whole hordes of persons, who struggle so little in self-defence against that which surrounds them, that they may be considered almost indifferent to its existence, or almost acclimated to endure its continuance. It is too true that, among these classes, there are swarms of men and women, who have yet to learn that human beings should dwell differently from cattle; swarms, to whom personal



cleanliness is utterly unknown; swarms, by whom delicacy and decency in their social relations are quite unconceived. Men and women, boys and girls, in scores of each, using jointly one single common privy; grown persons of both sexes sleeping in common with their married parents; a woman suffering travail in the midst of the males and females of three several families of fellow-lodgers in a single room; an adult son sharing his mother's bed during her confinement;—such are instances recently within my knowledge (and I might easily adduce others) of the degree and of the manner in which a people may relapse into the habits of savage life, when their domestic condition is neglected, and when they are suffered to habituate themselves to the uttermost depths of physical obscenity and degradation.

Here again, as in an earlier part of my Report, I think it requisite to remark, that I do not mean in any degree to suggest that the evils adverted to present themselves within the City to a greater extent than in sundry other parts of the metropolis. My sphere of duty lies within the City boundary, and it would be an impertinence in me to comment, either favourably or unfavourably, on districts which lie within another jurisdiction than that of the Commission which I have the honour to address. Simply to guard myself against the possibility of being misunderstood, I again draw attention to the fact that I studiously refrain from instituting comparisons with other metropolitan localities. Let me likewise observe that I am far from insinuating, or suspecting, that the majority of the poorer population of the city has fallen to that extreme debasement which I have just illustrated as affecting some portion (per-

haps not an inconsiderable portion) of the poorest; but I dare not suppress my knowledge that such instances exist, nor can I refrain from stating my belief, that ignorance and poverty will soon contribute to increase them, if sanitary and social improvement do not co-operate against their continuance.

Contemplating such cases, I feel the deepest conviction that no sanitary system can be adequate to the requirements of the time, or can cure those radical evils which infest the under-framework of society, unless the importance be distinctly recognised, and the duty manfully undertaken, of improving the social condition of the poor.

Those who suffer under the calamitous sanitary conditions which I have disclosed, have been led, perhaps, to consider them as inseparable from poverty; and after their long habituation to such influences, who can wonder if personal and moral degradation conform them more and more to the physical debasement of their abode? In the midst of inevitable domestic filth, who can wonder that personal cleanliness should be neglected? In an atmosphere which forbids the breath to be drawn freely, which maintains habitual ill health, which depresses all the natural spring and buoyancy of life, who can wonder that frequent recourse should be had to stimulants, which, however pernicious in themselves, still for a moment dispel the malarious languor of the place, give temporary vigour to the brain, and cheer the flagging pulses of a poisoned circulation? Who can wonder that habits of improvidence and recklessness should arise in a population, which not only has much ignorance and prejudice amongst it, but is likewise often unaccustomed to consideration and kindness? Who can wonder that the

laws of society should at times be forgotten by those whom the eye of society habitually overlooks, and whom the heart of society often appears to discard?

I believe that now there is a very growing feeling abroad, that the poor of a Christian country can no longer, in their own ignorance and helplessness, be suffered to encounter all the chances which accompany destitution, and which link it often indissolubly to recklessness, profligacy, and perdition. The task of interfering in behalf of these classes, however insensible they may be of their own danger and frequent degradation, begins at length to be recognised as an obligation of society; and as such an interference may be fraught with the utmost advantage to sanitary progress, I shall now proceed to point out the manner in which, with this view only, it may most usefully and most humanely be made.

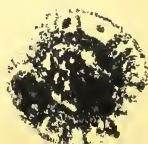
First of all I would point out to you, that within your Act of Parliament there are contained some enactments on this subject which might be of great value, were it not for their very limited application:—‘Whereas the owners and keepers of lodging-houses of an inferior description, for the accommodation of mendicants, strangers, and other persons for the night, or other short periods, allow the same to be crowded, by receiving more lodgers than such lodging-houses are adapted to contain with a due regard to health,’ therefore, and for some other reasons enumerated in the 91st clause, it is enacted that you may require the registration, and may order the periodical inspection of such houses; that you may from time to time fix and determine the number of lodgers who may be accommodated in each lodging-house; that you may issue ‘rules or instructions

regarding health, cleanliness, and ventilation;’ that you may ‘order that a ticket, containing the number of lodgers for which the house is registered,’ together with your rules and regulations, ‘shall be hung up, or placed in a conspicuous part of each room into which lodgers are received;’ and finally, ‘that if any keeper of such lodging-house shall offend against any of these provisions, he shall be liable for each such offence to a penalty not exceeding 5*l.*, and the like penalty for every day after the first upon which any such offence shall be continued.’ The spirit of these enactments is excellent; but unhappily the definition given at the end of the clause excludes from the operation of the law those very cases which most need to fall within it. ‘Common lodging-house’ (it runs) ‘shall, for the purposes of this act, mean any public lodging-house, not being a licensed victualling-house, in which persons are harboured or lodged for hire, for a single night, or for less than a week at one time, or in which any room is let for hire to be occupied by more than one family at one time.’ Lodging-houses, according to this definition, are (I am informed) hardly to be found within the City of London; and the clause has remained, and seems in its present form likely to remain, quite inoperative. If, in any future renewal or amendment of your Act, the definition could be modified in such a manner, that the powers given in respect of lodging-houses should be extended to all the poorer tenements of the City, where the several floors are let separately at a weekly rent, the clause in question would be rendered one of the most serviceable in the Act, and one of the most general application. In its present form, the clause barely enables you to deal with the temporary bed-accommodation

of trampers and vagrants,—a class happily not very numerous in the City; while, modified in the manner I suggest, it would put under your sanitary regulation the whole household economy of the permanent industrial population of the City; and, if effectively worked, would conduce beyond all estimation to the physical, social, and moral improvement of that class.

Secondly, and as a matter of even higher importance, I would beg you to consider the incalculable good which may be conferred on the poorer classes of society, by the direct educational influence of those in better and more enlightened circumstances than their own. When I say that all the social errors to which I now more particularly refer, would gradually but swiftly vanish under the influence of education, I do not mean that the cure would lie in learning to read and to write and to sum:—though these attainments, of course, would largely increase the power, usefulness, and market value of their possessor. The education to which I refer, as an all-important influence for sanitary progress, is that which would consist in exhibiting to the lowest classes of society frequent practical evidences of the attainability and the advantages of higher civilization; an education which, by model and examples, would lead them to know cleanliness from dirt, decency from grossness, human propriety from brutish self-abandonment; an education which, by sensible experience, would teach them to feel the comfort and the profit of sanitary observances, and would apply their instinct of self-preservation to the deliberate avoidance of disease.

It is in this point of view, gentlemen, that I would



solicit your attention to the useful and philanthropic exertions of three societies which have been established during the last few years, with the object of improving the condition of the labouring classes; and I would venture to suggest that the course which those societies have adopted in various parts of the metropolis, is one that might with the utmost advantage be pursued within the City of London.

The establishment of *Model Dwelling* and *Lodging-houses*, and of *Public Baths* and *Laundries*, for the use of the labouring population, is now no longer a matter of recent speculation. Under the beneficent auspices of the Societies to which I have referred, the following experiments have been tried:—

The Committee for promoting the establishment of Baths and Wash-houses, having at first Mr. W. Cotton, and then Sir H. Dukinfield, for its Chairman, and including in its number, with other influential persons, several members of this Corporation, founded, at great pains and expense, a model institution at Goulston-square, Whitechapel. In spite of many circumstances conspiring to render this first and experimental establishment particularly expensive, it has more than supported itself by the small payments of the poor; and its arrangements are sufficiently extensive for it to have given in one day as many as 932 baths. This fact, having occurred in the first year of its establishment, shows how much the poor must have appreciated the additional comfort placed within their reach; and I may add that, from the first opening of the building, the annual receipts have been progressively on the increase. Somewhat earlier, and under the influence of the same parent-committee,

though specially directed by a branch-committee, a similar establishment was founded in George-street, Euston-square. During the year 1848 the number of payments made here for bathing was 111,788; the number of payments for washing in the laundries, 246,760. This establishment has not only proved self-supporting, but has been enabled to accumulate a large surplus, which is now being applied to enlarge and improve the building. At Glasshouse-yard, near the entrance to the London Docks, there has been founded, on the same model, a small establishment of free baths and washhouses for the destitute poor. It was opened in May, 1845. In the first year the baths given amounted to 27,662; the usings of the laundry to 35,840; and its total working expenses were covered by £378.

No language, however eloquent—no comment, however instructive, could equal the significance of the figures which I have cited as illustrating the great utility of these institutions; and, as regards their pecuniary success, it is impossible to furnish you with better testimony than is comprised in the fact, that the Guardians of the Poor in a great metropolitan parish\* have recently, out of the poor-rates, founded an institution of this nature. They have become witnesses to the financial economy of that sanitary and social boon. In their establishment, which is not only self-supporting, but amply remunerative, the poor are enabled to have baths at an expense of a penny for a cold bath, and twopence for a warm bath; and the women are enabled to do their washing, ironing, and drying, with an unlimited

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\* St. Martin's in the Fields.

water-supply, and with other arrangements of most admirable completeness, at an expense of only twopence for the first two hours, during which they occupy the separate chambers allotted to them. A very considerable proportion of the expense is covered by the receipts for baths given at the higher price of sixpence, and with some additional luxuries, to persons of a higher grade in society than those who use the ordinary baths; the former, though used by a different class of persons, being sought with almost as much avidity as the latter.

In the sanitary point of view, I probably need not insist much on the advantages which these establishments have conferred. You will hardly doubt how good and wholesome a thing it has been for so many thousands to have had the means of cleanliness; who, in the absence of such facilities, must often have carried about their persons accumulations that one sickens to think of; and whose narrow, crowded chambers must constantly have steamed with wash-tubs, and been hung round with reeking clothes.

Next, very briefly, let me allude to what has been done in respect of the habitations of the poor; first, by the Society for the Improvement of the Condition of the Labouring Classes, under the patronage of their Majesties the Queen and the Queen Dowager, with the Prince Albert for its President, and Lord Ashley for its Chairman; secondly, by the Metropolitan Association for Improving the Dwellings of the Industrious Classes, under the Chairmanship of Sir Ralph Howard, and with a committee which, like that of the former society, includes many of the best



and wisest, as well as the highest persons of the country. Under the influence of these societies the following experiments have been made:--

In the Old Pancras-road a very large building has been erected, to accommodate 110 families separately and distinctly, in sets of two and three rooms each. Each set of rooms has its own boiler, range, oven, and coalbox; its separate scullery, in which are sink, cistern, and dust-shaft; its own watercloset, its own ample supply of water, and many other conveniences. The rents vary from 3*s.* 6*d.* to 5*s.* per week for a set of two rooms; and from 4*s.* 9*d.* to 6*s.* 3*d.* for a set of three rooms. The founders of this establishment have recently purchased land at the end of Spicer-street, Spitalfields, on which to erect a lodging-house for 300 single men, and also houses for families.

In the Lower-road, Pentonville, houses of three different classes have been built, on the same general principle of furnishing every convenience and sanitary requisite. They accommodate, on the whole, 23 families and 30 single women—widows, or of advanced age. The entire houses for families, with all the above-mentioned conveniences, are at a rent of 6*s.*, having a good-sized living room, two bedrooms, with additional enclosed recesses for children's beds, a yard at the back of the house, and the joint use of a wash-house and drying yard. A floor of two rooms is rented at 3*s.* 6*d.*, and a single room by a single person at 1*s.* 6*d.*

In George-street, St. Giles's, a model lodging-house has been established, affording accommodation to 104 single men, and combining everything essential to such an esta-

blishment. The ventilation and drainage have been carefully attended to; an ample supply of water is provided, gas extends through the house, the dormitories are arranged so as to keep their inmates private from each other; there are washing-closets fitted up with every requisite for cleanliness; there is a bath-room supplied with hot and cold water; there are a kitchen and wash-house furnished with all appropriate utensils, a pantry-hatch, with separate, ventilated, and secure compartments for the food of each inmate; in the pay-office is a small well-selected library, for the service of the lodgers, and the use of a spacious coffee-room is likewise for their common convenience. Their pay is 4*d.* per night, or 2*s.* a week—an amount little above the ordinary rent paid for the most miserable accommodation in a trampers' lodging-house.

At 76, Hatton-garden, a lodging-house for 57 single women has recently been opened, consisting of three floors of dormitories, divided into separate compartments, and a basement fitted up with kitchen, washhouse, bath, pantry, safes, &c.

In Charles-street, Drury-lane, three tenements, originally separate, have been converted into a single lodging-house for 82 single men, on the same general plan and at the same rent as that in George-street, St. Giles's.

All the lodging-houses are furnished; and the inmates are supplied with utensils for their food and other purposes, which must be returned, or made good, at their leaving.

In all these lodging-houses rules exist for the purpose of insuring cleanliness, sobriety, carefulness, and general propriety of conduct; any infraction of which subjects the

offender to immediate expulsion. For the sake of those who choose to avail themselves of the opportunity, Scripture readings are appointed to take place in the common room every evening at 9 o'clock; and copies of the Scriptures, with other well-chosen books, are left in charge of the superintendent for distribution among the lodgers, in the hope that they may thus be induced to occupy their leisure to advantage.

In the construction of all these establishments, equally, the greatest pains have been taken to bring sanitary science to bear on the comfort, and convenience, and health of the inmates. Ventilation, drainage, facilities for decency and for cleanliness, have in every instance been made the leading considerations of the architect.\*

In regard of these model houses and model lodgings, it would, I think, be a great error to estimate their benefit as

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\* The advantages of these admirable institutions may now be spoken of from longer experience. In a very remarkable pamphlet just published by Dr. Southwood Smith, *On the Results of Sanitary Improvement*, it is recorded that there has been no case of typhus fever in any one of the model-dwellings since they were first opened, and that their exemption from cholera has been as complete as from typhus. In the Metropolitan Buildings, during three years, the average annual mortality has been only 1.36 per cent. For a lower class of population, very similar advantages have been procured by the regulations of the Common Lodging-House Act. Dr. Smith mentions that in 1308 regulated metropolitan lodging-houses (numbering at least 25,000 lodgers) there had not occurred a single case of fever during the quarter ending the 23rd of October; yet, before they were under regulation, twenty cases of fever have been received into the London Fever Hospital from some one single house in the course of a few weeks.—J. S., 1854.

merely relative to the number of persons at any one time inmates of them. No doubt it is a great advantage that they furnish, at the ordinary prices of the day, or at a still lower price, so excellent accommodation to several hundreds of persons; and it is a still greater good (particularly in regard of those established for single men and single women) that they drill their inmates into decent and orderly habits, and accustom them to a high standard of household-accommodation, which will probably influence their subsequent married lives in the same desirable direction. But, indirectly, their utility has a far wider scope. They stand in bright contrast to the dark features of filth and unwholesomeness which environ them; they familiarise the poorest classes generally with all the practical advantages of cleanliness; they show that dirt is not inevitable; they therefore create and foster among the humblest members of society, a laudable discontent with defective sanitary arrangements; and they establish a strong public opinion, grounded on experience, in favour of those conditions of cleanliness and comfort, which determine the maintenance of health.

That all the great results of sanitary science can be applied in their utmost perfectness to the dwellings of the poor, for the payment of a rent often below, and never above, the average given for some miserable doghole, that poisons its inhabitants, is a truth of immense importance, deserving the widest dissemination, and pregnant with the most hopeful promise. Such advantages spring from and illustrate the economical application of the associative prin-

ciple; they cannot be obtained otherwise than by the application of capital, in such an amount as lies only within the compass of wealthy corporations, or is reached by the voluntary combination of several private purses. While the labouring classes are abundantly able to maintain these institutions when established, and to render them amply remunerative to those whose capital has first founded them, it is obvious that no power of association lying within their means can suffice to originate such work.

The task of initiation rests with others. And therefore it is, gentlemen, that on this occasion I have been induced to bring under your notice, as a most important part of my subject, the outline of what has been done in the matter of Model Dwellings and Public Baths and Washhouses. Feeling assured that establishments of this nature are of infinite utility in the several respects I have enumerated; feeling assured that, beyond their immediate operation on the health of inmates and users, they also tend, by their indirect educational influence, to improve the social habits, to promote the civilization, to elevate the general tone and character of the labouring classes, I earnestly recommend them to your attention; hoping that you may either yourselves confer on the poor population of the City the advantage of your patronage and succour in this respect, or else may transfer the matter to the jurisdiction of the Common Council, with all the influence and authority in its favour which your recommendation would insure.

## SUGGESTIONS FOR SANITARY ORGANISATION IN THE CITY.

HAVING now enumerated the sanitary evils of the City, and the remedies which appear to my mind most appropriate for their removal, it becomes desirable that, in concluding, I should point out to you the organisation which seems necessary to be adopted during the gradual transition of the City from its present to a healthier state;—an organisation which may render this transitional period as short as possible, and may most effectually contribute to mitigate, for the time, the pressure of such evils as cannot immediately be removed.

The object of this organisation lies in a word; Inspection—gentlemen, inspection of the most constant, most searching, most intelligent, and most trustworthy kind, is that in which the provisional management of our sanitary affairs must essentially consist.

I presume I may take for granted that, in some form or other, a *Committee of Health* will exist, either as a Committee of the Court of Common Council, or as one of this Hon. Court. I may, perhaps, further assume that such a Committee will have authority to entertain all subjects relative to the sanitary improvement of the City, and to make thereon such recommendations as shall seem fit to

them; and, further, that they will make it their business to receive periodical intelligence, as complete as possible, on all variations in the public health, and on all circumstances likely to affect it.

In order that any Committee, acting for sanitary purposes within the City, shall have a reasonable chance of success in its endeavours for the public good, the following means of information will be necessary for its use :—

1. That an account should be kept, corrected year by year, of every house within the City; as to the area of building, the number of floors, rooms, and windows; as to its ventilation; as to its drainage, water-supply, and other facilities for cleanliness; as to its method of occupation, and number of inhabitants:

2. That from this account there should be made out, at least twice yearly, a list of houses and streets remaining in an objectionable sanitary state; and a list, also, of such as may have been remedied to the satisfaction of the Committee since the formation of their last preceding list:

3. That, while trades injurious to health or offensive to their neighbourhood are suffered to continue within the City, there should be given periodical reports on the condition of such establishments, to the end that they may be so maintained as to be least detrimental to the public health:

4. That a record of every death registered as occurring

in the population of the City should lie before the Committee; and

5. I consider it quite indispensable, that they should likewise receive the largest and most accurate returns which can be procured of all sickness occurring among the poorer classes; and (particularly in respect of all epidemic, endemic, and infectious disorders) that the medical practitioner who communicates the fact of illness, should likewise report the existence of any local causes, or other influences of general operation, which have tended to produce, or are tending to continue, such illness.

On the subject of returns of the nature last referred to, I have already, on various occasions, submitted my opinion to the judgment of your Hon. Court. A year ago, in the first Report which I had the honour to make here, and in various discussions which during some months followed the reception of that Report, I stated how necessary I deemed such returns, for the purpose of guiding and justifying the various recommendations which it would become my duty to lay before you. The period which has since elapsed, including its three months of pestilence, has furnished me with the strongest confirmation of those views. As I formerly stated by anticipation, so now I repeat from experience, that nothing deserving the name of sanitary administration can exist in the City, without accurate periodical intelligence of all such sickness (at least) as comes under parochial treatment; or without such reports on the local sanitary conditions, and on other causes of disease, as were desired to accompany that intelligence.



When the matter was previously under your consideration, it was argued that the reception of such intelligence formed no part of your functions as a Commission for draining, lighting, paving, and cleansing the City of London; that all sanitary matters, beyond these and the like, were foreign to your proper sphere of operation; and that your funds, raised by rates from the citizens of London, could not with propriety be applied to meet the expenses of such an arrangement. On this question of jurisdiction and finance I shall, of course, hazard no opinion. I would simply beg to repeat, with regard to so much of the matter as lies within my own professional province, that the intelligence in question is absolutely necessary for the present progress of sanitary measures within the City; that no Health-Committee can exist for a month without it; nor can any officer, having proper respect for his character, consent to be considered responsible for the health of a population, whose illnesses he learns only from their posthumous record in the death-register.

During the recent prevalence of cholera, the Health-Committee of the Common Council complied for the time with my recommendation, and established a system of daily reports, rendered still more serviceable by free personal intercourse between myself and the several gentlemen having medical charge of the three City unions. What needed to be daily during a period of pestilence, might fitly become a weekly communication at all other times. I have already reported to the Health-Committee, and I beg to reiterate here, that the advantages derived from that system of communication were such as could have been attained in no other way.

I may remind you that each of the gentlemen referred to, serving under the Poor Law, works within a certain small and definite district; that he is therefore peculiarly competent to speak on the state of the population in that district, on their habits and necessities, on their customary condition of health, and on their liability to epidemic disease; and that the total staff of these officers, taken collectively, representing the medical practice of the whole city, can supply exactly that kind of detailed and precise information which is most serviceable to your Officer of Health, in guiding him to those more general and comprehensive conclusions which it is his business to lay before you. These gentlemen are the habitual medical attendants of the poorer classes; day by day, in the unobtrusive beneficence of their calling, they pass from house to house, and from court to court—the constant recipients of complaint, or the constant observers of ground of complaint—amid all that destitute population on whose condition you require to be informed. They are in the constant presence of the pestilences which reign in our worst localities; they are the chief treaters of endemic disease within the City—of that disease which, by its proportion, measures the success of sanitary changes, or indicates their failure; and it has been the professional education of these gentlemen, as it is their business, to trace such effects to their causes. Their reports would be the authenticated statements of experienced medical practitioners, familiarly conversant with their several respective localities.

If it were your wish and object, with utter indifference to expense, to organise the best scheme for procuring to yourselves from time to time a succession of accurate and trust-

worthy reports on the state of health, and condition of dwellings, in the several districts of the City;—if you were willing to engage a large number of non-medical persons who should give their whole time to the duty of exploring and reporting on that state, I am persuaded that this expensive and cumbrous proceeding would have a smaller measure of success than that which I submit to you, and which consists essentially in availing yourselves of the local knowledge and daily observations of a staff of officers, already organised and in active occupation for the very purposes in question.

That such intelligence, embracing weekly returns from the eleven parochial surgeons of the City of London, and including their comments on the local causes of prevailing disease, would involve an annual expenditure of money,\*—and that this expenditure, sooner or later, and in some form or other, would be derived from the rate-paying portion of the community, are facts which cannot be doubted. But that the expenditure would be a judicious one; that it is indispensable to the effective working of any Health-Committee, or any Health-Officer within the City; that it would be the first step to the mitigation of the disorders reported on; that it would disclose evils which else must escape recognition and remedy; that in a few years it would render our general mortality of 3 per cent. on the entire population of the City a matter of history and a warning, instead of its being, as now, a present and awful reality;

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\* When the matter was last under consideration of the Commissioners, it appeared that the expense of such an arrangement would be about £250 annually.—J. S., 1854.

that in lessening sickness and death, it would stay a large source of pauperism, would diminish the number of occasional and habitual claimants of Union relief, and would become a measure of real and considerable economy;—these are points on which, with the utmost sense of official responsibility, I beg to record my deliberate conviction.

Accordingly, I have to recommend that any Committee, which may undertake the administration of sanitary affairs for the City, shall be furnished as completely as possible with information of the nature I have specified.

Another element to which I think it necessary to advert, in connexion with a future sanitary organisation for the City, is this,—that some permanent arrangement should be made, by which the maintenance of exterior and interior cleanliness, the enforcement of scavengers' duties, the suppression of nuisances, and the like, should be brought under habitual and systematic surveillance; one, by which all breaches of your present or future sanitary regulations may be quickly detected, and may be visited with their appropriate penalties as speedily and as certainly as possible. I am induced the rather to bring this subject before you, as complaints of scavengers' duties being neglected have reached me at every turn. I am informed that it is usual for them to refuse to remove dirt and rubbish from houses, according to the terms of their contract, except on the tenants' payment of an additional gratuity; and it must be obvious to your Hon. Court that the arrangements which you have made by contract for this purpose are virtually defeated, as regards the poorer population, when the removal of refuse-

matter is made contingent on the gift of beer-money by those whose means are so restricted.

It is in respect of matters of this sort, and of such only, that I think the services of the Police-Force might usefully be employed. Their want of special education, and their employment in other duties, are circumstances which appear to me quite conclusive for objecting to their utilisation as sanitary reporters. But while I entertain the opinion that their employment in the latter direction would be both fruitless and inconvenient, I would submit that their numbers and their diffusion through the City qualify them well to act against all causers of nuisance, as they act against other offenders, both detectively and preventively; and I would venture to repeat a suggestion, which I made in January last, 'that the police should consider it part of their duty, to report on every nuisance within their knowledge, and on every infraction of such sanitary rules as this Court may establish.

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Here, Gentlemen, terminates the list of subjects which, on this occasion, I have thought it my duty to bring before you. Long as the enumeration may have appeared, I can assure you that my present Report bears a small proportion, in point of dimensions, to the very large and very various mass of materials on which it is founded. In compressing it within the narrowest limits consistent with intelligibility, and in excluding from it nearly all details on the matters treated of, I have consulted the convenience of

your Hon. Court, notwithstanding the greater labour and difficulty of execution which belong to the plan I have adopted. At any time, in Court or in Committee, when you may wish to pursue the subject, I shall be ready to enter at far greater length, and with more elaborate minuteness, on any of those subjects which, at the present opportunity, I have only sketched for your general information.

In the matters which I have enumerated, some lie distinctly within your province, as assigned by the Act of Parliament; while others may be thought to lie, just as distinctly, without that province. In affairs strictly under your jurisdiction, and within the present scope of the law, there remains very much to achieve. The complete enforcement of house-drainage, till every house washes itself into the sewer; the more general distribution of water, till every individual within the City has an abundant supply within his immediate reach; the effective preservation of public cleanliness; the construction and maintenance of sewerage, paving, lighting, for all the streets, courts and passages of this great City;—these constitute an immense amount of responsibility and labour. Those other objects to which I have referred, are partly such as cannot be accomplished without the further interference of the Legislature. It is a point solely for the discretion of your Hon. Court to determine, how far you may be willing to enlarge the sphere of your sanitary operations, and to undertake the difficulties of a new campaign.

To your Officer of Health the Act of Parliament allows no such option. ‘Whereas the health of the population,

especially of the poorer classes, is frequently injured by the prevalence of epidemical and other disorders,' therefore it is appointed for his duty that he shall report on whatsoever 'injuriously affects the health of the inhabitants of the City,' and that he shall 'point out the most efficacious mode of checking or preventing the spread of contagious or other epidemic disease.' Actuated by obligation of the duty thus expressed in your Act of Parliament, after full reflection on all that those expressions imply, and with the deepest sense of the responsibility belonging to one who is honoured with the task of advising the first Corporation of the country in respect of its sanitary proceedings, I have been compelled, in the course of my present Report, to trench upon many subjects which do not customarily fall under your consideration, and which (as I have stated) may by some be considered as utterly foreign to your jurisdiction and province.

It rests with your Hon. Court to determine what course you will adopt in respect of such departments of the great sanitary scheme;—whether you will retain them under your consideration, and will assume the responsibility of dealing with them in proportion to their magnitude and importance, or will transfer them to the Court of Common Council for the less restricted deliberation of that body.

Let me once more declare my profound conviction of their importance to the health and welfare of the City.

To provide an inoffensive outfall for the sewerage of our vast population; to render the river a source of unqualified advantage; to give wide extension and sounder principles to the system of water-supply; to suppress all trades and occupations which taint the atmosphere with materials of

organic decomposition; to abate the nuisance of smoke; to provide the facilities for extramural interment, and to procure the prohibition of all further burial amidst our living; to improve the domestic arrangements of the poor, and to insure for them an adequate supervision; to establish public baths and laundries, which may offer the utmost facilities and inducement for the maintenance of personal cleanliness; to hinder the occupation of houses which breed pestilence; to destroy such as are irremediably hostile to health, and to disperse the stifled population of courts and alleys; to substitute for such slums as we hope to depopulate and destroy, but in open streets and with perfect ventilation, houses and lodgings, which not only shall offer to the labouring classes every convenience essential to health and decency and comfort, but shall likewise serve as models of household economy for the whole district in which they stand;—these, Gentlemen, are the aims, briefly recapitulated, for the sake of which I have been obliged, as it were casually in my Report, to touch on many subjects perhaps foreign to your jurisdiction, but lying at least on the confines of your province, and remaining with you now either to retain or to transfer.\*

That the subject of sanitary improvement in its widest scope, and with all that even incidentally relates to it, is one which, according to the ancient constitution of the

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\* Perhaps, to make these passages intelligible, the reader should be apprised that the business of the Corporation is considered in a great variety of Committees, which thus have their several and particular provinces. Of the many matters adverted to, as foreign to the ordinary functions of the Commission of Sewers, some might belong to the *City-Lands* Committee, some to the *Improvement*, some



City, rightfully belongs to the authorities of the Corporation, in some one or other of their municipal relations—that it belongs to them equally as their privilege and their duty, cannot for a moment be questioned. And if your Hon. Court should determine on a negative opinion as regards yourselves, and should decide on transferring these matters to the Common Council, I venture to hope that your influence may accompany them in their course, and may procure for them the consideration they deserve.

Gentlemen, the history of the City of London is full of great examples of public service. It records many a generous struggle for the Country and for the Constitution; it records a noble patronage of arts and letters; it records imperial magnificence and Christian liberality; but never, within the scope of its annals, has the Corporation had so grand an opportunity as now for the achievement of an unlimited good. Because of the City's illustrious history, and because of the vast wealth and power which have enabled it so often to undertake the largest measures of public utility and patriotism,—therefore it is, that the expectations of the country may well be fixed on the City of London in regard of this, the distinguishing movement of modern times—the movement to improve the social condition, and to prolong the lives of the poor.

Those who are familiar with the many abiding monu-

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to the *Finance*, some to the *Navigation*, some to the *Markets* Committee, and so on. Obviously it would have been out of my place to touch on these details of jurisdiction; and I therefore urged only the essentially *municipal* character of the several improvements I advocated.—J. S., 1854.

ments of your civic munificence and splendor, may well expect that, in approaching this all-important question, the counsels of the City will be swayed by high and generous considerations.

In the great objects which sanitary science proposes to itself,—in the immense amelioration which it proffers to the physical, to the social, and indirectly to the moral condition of an immense majority of our fellow-creatures, it transcends the importance of all other sciences, and in its beneficent operation seems most nearly to embody the spirit and to fulfil the intentions of practical Christianity.

Ignorant men may sneer at its pretensions; weak and timorous men may hesitate to commit themselves to its principles, so large in their application; selfish men may shrink from the labour of change, which its recognition must entail; wicked men may turn indifferently from considering that which concerns the health and happiness of millions of their fellow-creatures. To such men an appeal would indeed be useless. But, to the Corporation of the City of London—whether as assembled in its entire Parliament, or as represented within the confines of this Court—to the Corporation which, on so many occasions, has attained patriotic ends by great expenditure and sacrifice; to men earnest, strong-minded, and practical, having much consideration for their fellow-creatures, and having little consideration for personal toil or municipal expense, so only that they may fulfil a great Christian duty, and may confirm the gratitude with which history records their frequent services to our kind;—to such a Corporation, and to such men, the Country looks for the perfection of a

sanitary scheme which shall serve as model and example to other municipal bodies undertaking the same responsibility; and to such a Corporation and to such men do I, likewise, your Officer of Health, respectfully and confidently address a well-founded appeal.

I have the honour,

&c., &c.

## FURTHER REMARKS ON WATER-SUPPLY.

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ADDRESSED TO THE HEALTH-COMMITTEE OF THE HON. THE COMMISSIONERS OF  
SEWERS OF THE CITY OF LONDON, PURSUANT TO A REFERENCE—

*“What would be a sufficient supply of water to the houses and premises within the City, and the best principle upon which to effect such supply?”*

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February 21, 1850.

GENTLEMEN,

Such further observations on the subject of ‘Water-Supply to the City’ as you have desired me to lay before you, I have now the honor to submit, in as condensed a form as possible.

First, I may remind you, that in my report of last November, which still remains under your consideration, I stated the following ‘as the chief conditions in respect of Water-Supply, which peremptorily require to be fulfilled.

‘1. That every house should be separately supplied with water; and that, where the house is a lodging-house, or where the several floors are let as separate tenements, the supply of water should extend to each inhabited floor.

‘2. That every privy should have a supply of water, applicable as often as it may be required, and sufficient in volume to effect at each application a thorough flushing and purification of the discharge-pipe of the privy.

‘3. That in every court, at the point remotest from the sewer-grating, there should be a stand-cock for the cleansing of the court; and

‘4. That at all these points there should always and uninterruptedly be a sufficiency of water to fulfil all reasonable requirements of the population.’

In re-organising the system of water-supply there are some other purposes, of a more public nature than these, which would likewise claim your attention: such as (1) an improved arrangement for meet-

ing all accidents and emergencies of fire ; (2) an efficient distribution of water to all common urinals and privies ; (3) a sufficiency of supply for any public baths and wash-houses, which may be hereafter erected ; and (4) an ample surplus to be at the disposal of the Commission for the cleansing of streets and sewers.

In order that those domestic purposes, which I first enumerated, should be adequately fulfilled, the supply of water ought, practically speaking, to be without limit to any individual consumer. It is the tendency of the system of constant supply, and constitutes a distinguishing advantage of that system, that it fulfils this important condition without any increase, or perhaps rather with a diminution, of the total draught of water for a large population.

The average of requirement (estimated from the consumption of large communities) would probably be about 12 gallons per person per diem ; making an amount, for the total population of the City, of about  $1\frac{1}{2}$  million gallons per diem. Assuming this estimate to be correct, a point which I would beg you to observe is the following : that, although there might be very little fluctuation in the *total quantity consumed*, and although it might remain constant at the figure I have given, yet in the items of individual consumption, making up this gross amount, there would be almost infinite varieties. One family would habitually consume twice as much water as another family of the same size : one family would consume six gallons per person on five days of the week, and would require all its remaining quota on the other two days ; and so forth. These differences and caprices of individual requirement do not sensibly affect the total quantity consumed in a given week by a population of 130,000 persons ; one consuming more, another less, the first counterbalances the last in forming the materials for a fair personal average ; and a source of supply calculated from such an average for a large population would, practically speaking, be unlimited to each individual consumer, provided only that it were so distributed, that each consumer could draw from the common stock at his own time and according to his own necessity. This advantage is obviously lost under the present system of intermittent supply, which compels a larger total distribution than would else be requisite, entails the expensive and unwholesome necessity for storage, and yet is notoriously fraught with the inconveniences of a restricted source, or a defective supply.

I have no sufficient data for judging with precision what quantity of water might be required to fulfil all those public purposes of cleanliness and of protection from fire, to which I have adverted. The supply would require to be *practically* inexhaustible; but the consumption, on an average of the four seasons, would probably lie considerably within half a million of gallons per diem.

When the distribution of water is brought into its proper relations with the drainage of the City—that is, when the arrangements of domestic drainage are completed, in conformity with the intentions of the Act of Parliament, and when all the water, distributed for private consumption, is made to traverse and to cleanse all the channels of house-drainage, it is probable that a smaller quantity of water than is now consumed will suffice for the flushing of sewers, and for other so-called sanitary purposes.

The quantity at present supplied to the City by its two Water-Companies is perhaps much in excess of the two millions of gallons per diem, which I have estimated as a sufficiency for our population; but the distribution is so unequal, and the waste of the intermittent system so incalculably great, that the effect produced on the population is, to a very great extent, that of scarcity.

With regard to the *principle of supply* on which I have been desired to report, it seems certain to my mind, from such evidence as I can collect on the subject, that the system of continuous supply at high-pressure promises advantages which can never be realized under the present system of intermittent supply. There are many matters connected with the comparison of these two systems, which lie beyond my sphere of professional observation, and on which I would not be bold enough to offer any opinion to your Committee. The sanitary points, on which alone I would venture to insist, as benefits in the system of continuous supply, are—first, the practical inexhaustibility of the source, and secondly, the absence of necessity for storage. If these benefits are attainable, and especially if (as alleged) they can be obtained at a material economy of expenditure, as compared with the present system, there can be little doubt as to which should obtain the preference.

If your Committee should wish, it would be easy to prepare for your examination a digested summary of such scientific evidence as has been given on these points: or it might be expedient, if such a course would be more satisfactory to you, that some person in your confidence should undertake to visit and inspect one or more of the

towns where the system of continuous supply is in operation, and where direct information can be gathered on the very important particulars of its practical efficiency and success. But, at all events, whether your Committee should wish or should not wish this personal investigation to be undertaken, I would suggest, that it might be satisfactory to you and serviceable to the inquiry in which you are engaged, if you would procure a report from some eminent hydraulic engineer, practically conversant with the system of continuous supply, who might furnish you with conclusive testimony as to the admissibility of this system within the City, and as to the advantages and disadvantages, sanitary and economical, which might attend its adoption here, as compared with that which has hitherto prevailed.

It appears to me that at the present time the system of continuous supply might, provisionally, receive a fair trial in the City, in respect of some of those poorer habitations, which are now for the first time about to be supplied with water and drainage. The Water-Companies would probably not object, if desired by the Commission, to supply a hundred houses, experimentally, with constant pressure from their mains. The Commission might select for its experiment some of those courts about Cripplegate or Bishopsgate, where the drainage, as well as the water-supply, requires to be constructed anew: some, where there have hitherto been undrained cesspools, and where the water-supply has been from a stand-cock. Should this suggestion be found feasible, I would recommend that the details of its execution should be carried out under the joint superintendence of your Surveyor and myself, and that we should afterwards report to you its results, as material for guiding your decision with regard to the general supply of the City.

Mr. Quick, Engineer to the Southwark Water-Works, in a letter which is appended to Sir William Clay's pamphlet, has recently suggested various arrangements for an uninterrupted supply, and these have no doubt been under your Surveyor's consideration. I may add, too, that there are at present upwards of 40 houses within the City constantly supplied from the mains of the East London Water-Works; but as these are not houses of the poorest description, it is possible that they may not constitute so satisfactory a proof of the feasibility of the constant supply, or so complete an illustration of the detailed arrangements for its employment, as could be given by the experimental construction I have suggested.

While the supply remains, as at present, an interrupted one for the City generally, I would recommend that the Commission should procure from the Water-Companies an arrangement for the delivery to occur, under no circumstances, less than daily; and that Sunday should form no exception to this arrangement. Many tenants of the Water Companies at present receive their supply only on alternate days, Sunday counting as a *dies non*, so that a necessity is entailed in such cases for a three days' storage of water.

Whether the *quality* of water supplied to the City by the existing Companies is such as it ought to be, or whether some purer source of supply may be found; whether their neglect of filtration, notwithstanding the important weight of testimony given in its favor, be not a serious dereliction of their duty to the public; whether the sanitary interests of the consumers of this first necessary of life can be properly protected, while at variance with those of the great trading companies which hold a virtual monopoly of the supply; whether it would not be an immense boon to the Citizens of London, that the control of the water-supply should be vested in the same jurisdiction as the drainage, paving, and sanitary cleansing of the district; are questions which have forced themselves closely on my attention while considering the sanitary affairs of the City, and on which I hope shortly to lay some special observations before this Committee or before the Court.

I defer dwelling on these subjects at present, partly because they were not mentioned in your Committee's specific reference; partly because I think it desirable to wait for the issue of the experiment which I have suggested with regard to the competing system of supply; and partly because I have reason to know that at the present moment a very extensive series of chemical investigations is proceeding under orders of the Government, with a view to ascertain the purest possible sources for the water-supply of the metropolis. The results of this inquiry, so far as they have transpired, appear to me so infinitely important in their relation to some of the questions just alluded to, that I think it expedient under the circumstances to wait for such new light as may accrue to our knowledge from the completion of these researches, before I touch the chemical division of the subject.

I have, &c. &c.



# SECOND ANNUAL REPORT.

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TO THE HON. THE COMMISSIONERS OF SEWERS OF THE CITY  
OF LONDON.

*November 26th, 1850.*

GENTLEMEN,

**I**N obedience to that clause in your Act of Parliament under which my office is constituted, and which enjoins on your Officer of Health that he shall 'report periodically upon the Sanitary condition of the City,' I now submit to your Hon. Court my annual statement on this subject.

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## I. MORTALITY OF THE CITY OF LONDON.

During the fifty-two weeks, dated from September 30th, 1849, to September 28th, 1850, there died of the population under your charge 2752 persons. The rate of mortality, estimated from these *data*, for a population\* of 125,500, would indicate somewhat less than twenty-two deaths (21·92) out of every thousand living persons.

Last year it was my painful duty to record the ravages of pestilence, then indeed hardly terminated, under the pressure of which our general death-rate had arisen to the alarming

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\* With the required correction for increase of population, the death-rate was probably about 21·25 *per* 1000.

SECOND ANNUAL REPORT.

height of thirty in the thousand. On this present occasion, I have the happier task of laying before you the evidences of a mortality lessened considerably below its habitual average; and I rejoice in congratulating your Hon. Court on the testimony thus borne to the success of your sanitary exertions. For although, without question, some large share of this striking improvement may have depended on circumstances beyond our cognizance or control; although it may in part be but an instance of that tendency to periodical alternations of activity and repose which we recognise in disease, as in other operations of nature; although I should be over-sanguine if I believed, and premature if I stated, that your sanitary measures during the past twelve months had wrought such a change in the City as to ensure a continuance of this year's comparative healthfulness; yet I may venture without hesitation to assure you, that the labours of the Commission have been fruitful of real and demonstrable advantage to the health of the people; that a sensible diminution has occurred in the physical causes of disease; and that, from various and disinterested sources, I hear grateful mention of improvements which you have effected.

In confirmation of this assurance, I may inform your Hon. Court that, in collecting my materials for the present statement, I solicited from the Union-Surgeons of the whole City of London certain particulars of information which they were peculiarly able to furnish; I inquired of them, namely, whether, during the past year, there had prevailed among the poorer classes in their several districts more or less than the ordinary pressure of epidemic, endemic, and infectious disease; and whether, in case of such difference having been observed, they could refer it, either for better

or worse, to any changes recently wrought in the physical conditions of their respective neighbourhoods. They have had the kindness to furnish me with the information requested of them; and their replies testify with remarkable uniformity, both to the abatement of disease within their several provinces of practice, and to the considerable dependence of that improved condition of health on sanitary works effected under your auspices.

In order to form a correct estimate of the average mortality in any district, it is indispensable that one's records should extend over many years. Thus only is it that fallacies can be avoided which arise from the alternate pressure and remittance of epidemic disease. The havoc effected by a periodical visitation of influenza, cholera, or plague, varies, in like manner as the ordinary death-rate varies, in different localities; and its variation contributes importantly to fix the healthiness or unhealthiness of such localities. But obviously, if we wish for practical purposes to calculate an annual rate of mortality, and to decide, in respect of any district, what are the chances of life for its population, we must distribute the peculiar mortality of the pestilence-period over those years which intervene between visitations of the pestilence.

Hitherto, in respect of the City of London, I have the record of only two years; two years differing from one another in the proportion of 30 to 22, and the mean mortality deduced from that biennial period would be 26 per thousand per annum.\* I am, of course, unable to tell you

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\* On account of corrections already adverted to, this mean death-rate should be reduced, probably to 25.2.

with certainty whether that ratio be the true average death-rate of the City; but I incline to believe that an average calculated from a longer period, with less abrupt fluctuations, would give a lower figure as the accurate one.

In future years, so long as I may have the honour of reporting to the Commission, I purpose proceeding, step by step, to the construction of a cyclical average from the materials which will constantly be increasing; and I trust that many years may elapse before any approach shall again be made to the high death-rate with which the cycle commenced.

It may be useful, for the sake of comparison, that I should remind your Hon. Court of some of the more important differences which prevail throughout the country, in regard to the local rates of mortality. The extreme rates recorded in the Registrar-General's last publication, relating to the septennial period 1838-44, give 14 per thousand per annum as the lowest average, and  $33\frac{1}{2}$  as the highest average, for a population male and female in equal proportion. The low average belongs to a district in Northumberland, numbering 27—28,000 inhabitants; the high average is assigned to Liverpool. For the whole south-east division of England (comprising more than a million and a half of inhabitants) the death-rate is but 19; while in parts of the division it falls very considerably below this average. I have thrown these and some similar comparisons into a tabular form, which may perhaps be interesting to you.\*

Possibly it may occur to you that these comparisons are

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\* Vide page 84.

devoid of practical application—that it is unreasonable to suppose we can mitigate our London death-rate to the likeness of a selected country mortality—that the circumstances of the two populations are essentially and unalterably dissimilar—that the advantages of the one cannot be given to the other—that the traditional ‘threescore years and ten’ of human life are allotted only to rustic existence—that the right of participating in the higher civilisation of the metropolis, or of trading in its larger market, is not too dearly purchased by the tax of half or a third of one’s fair expectation of life.

On general grounds I should not hesitate to combat this objection, and should feel sure of convincing you of its invalidity. I should argue (as indeed I have already argued here) that the main conditions which constitute the unhealthiness of towns are definite, palpable, removable evils; that dense over-crowding of a population—that intricate ramification of courts and alleys, excluding light and air—that defective drainage—that the products of organic decomposition—that contaminated water and a stinking atmosphere, are distinct causes of disease and death; that each admits of being definitely estimated in its numerical proportion to the total mortality which it contributes to cause; that each is susceptible of abatement or removal, which will at once be followed by diminution of its alleged effects on the health of the population. Likewise, I should argue, that if there indeed exist, attached to a metropolitan residence, some really unavoidable and necessary disadvantages to life (a point which however I am not prepared to concede) there are likewise, as respects the poor, some peculiar advantages to counterbalance those evils; that in urban communities the

operations of charitable relief are largest and least remitting; that the resources of medicine for curing what cannot be prevented are likewise readiest and most effective.

On all these general grounds I should be prepared to maintain that a lowness of mortality which has been attained in any considerable rustic population, may be attained by an urban population, if only the removable evils be removed, if only the practicable good be made practical.

Surely too, above all, I would maintain this possibility in respect of our capital—the treasury as she is of all means for progress in civilisation, the stronghold of all applicable knowledge. Let but the wealth, the science, the energy, and the benevolence of the metropolis deal with removable causes of death as they have dealt with subjects infinitely more difficult, infinitely less promising, and certainly of not greater importance; and few competent persons will doubt that the mortality of London might speedily be reduced to the level of any district-mortality yet recorded by the Registrar-General.

There may be those in your Hon. Court who will hesitate to accept for themselves the firm conviction which I entertain on this subject; or who, at least, will withhold their assent from the line of argument which I have advanced. To them, what I have now to state may be more conclusive than any other consideration: viz., during the year on which I am reporting, there was one sub-district of the City of London Union—one comprising from twelve to thirteen thousand inhabitants, in which (after including a due proportion of deaths which had occurred in the union-workhouse at Mile-end) the mortality stood only at 15 in the

thousand; one in which, if those extramural deaths had been excluded, the local death-rate for the year would have been only 13·32.\*

For an illustration of low and enviable death-rates, I need then no longer appeal to Northumberland, or to our south-eastern counties—though, no doubt, their septennial periods of low mortality are valuable corroborations of any inference which could be drawn from our more restricted experience;—but I may point to the last year's death-rate in the north-west sub-district of the City of London Union as one of rare excellence, and may content myself with wishing that that partial rate might become universal for the City, and might be the permanent expression of its average mortality.

A detailed consideration of our sickness and mortality during the last year suggests to me a few other remarks, which may, I think, be of practical utility to your Hon. Court.

First, as regards the ages at which death occurs; the respective proportions of *timely* and *untimely* deaths may, generally speaking, be inferred from the local death-rates. In general terms, we know a high death-rate indicates that many die before their time—indicates that a proportion of the population, more or less considerable, instead of reaching old age, becomes prematurely blighted and extinguished. In order to illustrate this subject to you more exactly, I

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\* These figures require some correction for decrease of population in the sub-district referred to: the death-rate, inclusive of work-house mortality, was nearly 16, and exclusive of that mortality, nearly 14 *per* thousand.—J. S., 1854.

append a table in which the deaths of the last two years are classified according to the ages at which they occurred. Of 3763 persons whose deaths are recorded in my last Report, 1243 died under the age of five years: of 2752 deaths registered in the present year, 1032 belong to the same early period of life.

The City of London appears peculiarly fatal to infant life. Reference to the Registrar-General's last septennial record shows that of every 1000 male children under five years of age within the City of London (aggregately) nearly 113 die in each year; and the portion of this rate which is deduced from the East and West London Unions is as high as 119 in the thousand. In the subjoined table,\* which illustrates

| * Places.                      | General death-rate per thousand per annum. | Death-rate per thousand per annum of male children under five years of age. | Out of entire living population what proportion is under five years of age? | Out of entire mortality what proportion occur under five years of age? | By what multiple is the mortality of children under five years in excess of the average mortality of all ages? |
|--------------------------------|--|---|---|--|--|
| City of London Union .....     | 21   | 101   | $11 \cdot \frac{1}{109}$  | $2 \cdot \frac{1}{66}$   | 4·17   |
| E. and W. London Union ...     | $26 \frac{3}{4}$                           | 119   | $9 \cdot \frac{1}{102}$   | $2 \cdot \frac{1}{24}$   | 4·02   |
| Metropolis .....               | 25   | 93  | $8 \cdot \frac{1}{48}$  | $2 \cdot \frac{1}{46}$   | 3·45   |
| Holborn .....                  | 26   | 115   | $8 \cdot \frac{1}{98}$  | $2 \cdot \frac{1}{20}$   | 4·08   |
| St. Giles .....                | 27   | 122   | $9 \cdot \frac{1}{85}$  | $2 \cdot \frac{1}{24}$   | 4·39   |
| St. Martin .....               | 24   | 120   | $10 \cdot \frac{1}{64}$   | $2 \cdot \frac{1}{42}$   | 4·39   |
| Bristol .....                  | 29   | 107   | $8 \cdot \frac{1}{78}$  | $2 \cdot \frac{1}{53}$   | 3·45   |
| Liverpool .....                | 33   | 143   | $7 \cdot \frac{1}{35}$  | $1 \cdot \frac{1}{11}$   | 3·85   |
| Lancashire .....               | $26 \frac{3}{4}$                           | 102   | $7 \cdot \frac{1}{19}$  | $2 \cdot \frac{1}{12}$   | 3·56   |
| Surrey .....                   | 18   | 48  | $7 \cdot \frac{1}{98}$  | $3 \cdot \frac{1}{22}$   | 2·48   |
| South-east divn. of England... | 19   | 52  | $7 \cdot \frac{1}{76}$  | $3 \cdot \frac{1}{33}$   | 2·56   |
| Glendale .....                 | 14   | 28  | $10 \cdot \frac{1}{32}$   | $3 \cdot \frac{1}{99}$   | 2·58   |
| Bellingham ...                 |  |   |   |  |  |
| Haltwhistle ...                |  |   |   |  |  |



some points of comparative mortality, I have endeavoured to show the extreme and disproportionate amount of this pressure on infant life. In referring (for instance, in regard of the City of London Union) to the last three columns of that table, you will observe that the mortality of children at the age stated, during the septennial period, was  $\frac{1}{2.66}$  of the entire mortality, although their class numerically constituted only  $\frac{1}{11.09}$  of the entire population; so that they died at more than four times (4.17) the rate which would have fallen to them as simple participators in the average mortality of their district. The actual infant mortality of the past year holds the same proportion to the general mortality as in the Registrar-General's septennial period, being  $\frac{1}{2.66}$  of the whole.

Lest any undue importance should be ascribed to the influence of bad or inappropriate articles of diet in producing this large infant mortality, I may inform you that the rate of death is highest during that very early period of life when the child depends for nourishment on its mother; so that, of a thousand male children in the first year of life there die within the district of the City of London Union 242; within that of the East and West London Unions, 276.

The causes which thus decimate the young population of London are the common conditions of district unhealthiness—the conditions which it lies within the scope of sanitary legislation to amend. But, inasmuch as the few days of these wretched children are passed mainly within doors, so their high mortality constitutes the readiest and least fallacious evidence of the unwholesomeness of the dwellings in which they die: and hence I am acquainted with no

correcter material for estimating the sanitary condition of a district than is afforded by the death-rate of its infant population.

Secondly, with regard to the alleged *particular causes of death*; I have extracted from our general registry, and have grouped in a separate table, those cases of death from acute disease which seem peculiarly due to physical causes affecting large numbers of persons.

There are deaths by cholera, epidemic diarrhœa, and dysentery, of which during the biennial period we have had nearly 900; by fever, of which we have had 284; by erysipelas and puerperal fever, of which we have had 84; by small-pox, of which we have had 50; and cases of this sort partake of the nature of deaths by violence, not only because they are abrupt and untimely, but because they are *avoidable*. If in the instances which I have specified it were possible to make inquiry into the antecedent circumstances of the dead, you would find irrefragable evidence that life was lost in each individual instance by the operation of removable causes—by the foolhardy neglect of some familiar precaution, or by the obstinate retention of some notorious ill. The death of a child by small-pox would in most instances call for a verdict of ‘homicide by omission’ against the parent who had neglected daily opportunities of giving it immunity from that disease by the simple process of vaccination; the death of an adult by typhus would commonly justify still stronger condemnation (though with more difficulty of fixing and proportioning the particular responsibility) against those who ignore the duties of property, and who knowingly let, for the occupation of the poor, dwellings unfit even for brute tenants, dwellings abso-

lutely incompatible with health. In addition to the diseases which I have named, there are others which owe their chief malignity and numerical largeness of fatality, though not their existence, to local and removable causes. The proportionate mortality from scarlatina, measles, and whooping-cough, is greatest when the general death-rate is greatest. Under similar circumstances, too, we find among the infant population a frequency and fatality of other diseases, not commonly accounted specific, which warrant us in considering them to be mainly of endemic and avoidable origin. Such are the hydrocephalus and convulsions, the diarrhœa, bronchitis, and pneumonia of infants; often indeed referred to the irritation of teething, but prevailing in different localities with so marked a proportion to the causes of other endemic disease that we may be sure of their partial and considerable dependence on those local and obviable causes. I dwell on this aspect of the subject, and particularly invite the attention of your Hon. Court to the table\* which illustrates it, because it is in respect of these diseases that your exertions have already effected valuable improvements for the health of the City, and because the future registry of such cases will attest year by year the further progress of your sanitary reforms. In examining this index of preventable deaths you will notice that those from fever are fewer by 29 *per cent.* in the year just terminated than in the previous twelve months; that those from scarlatina are 75 *per cent.* fewer; those from infantile zymotic disorders nearly 40 *per cent.* fewer; those from erysipelas and puerperal fever 9 *per cent.* fewer. Small-

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\* *Appendix, No. IX.*

pox, it is true, is doubled; but the prevention of this disease rests, out of your jurisdiction, in the exercise of individual discretion. Under the item of infantile diarrhœa (included in the tenth column) there is likewise an increase of nearly a third;\* an exception probably dependent on the fact that, during last year, many deaths which might have swelled this column were (on account of the then prevalent influence) catalogued under the head of epidemic diarrhœa or cholera.

I should be misleading your Hon. Court, and practising a deception which next year's registry would expose, if I pretended that the striking difference between the two years' several totals of preventable deaths (a difference which, leaving cholera out of the question, probably amounts to a diminution of 30 *per cent.* on the sum of last year) had resulted wholly, or even chiefly, from sanitary improvement, and could be interpreted as the evidence of permanent physical changes around the dwellings of our poorer population. I guard you against this impression now, because, however satisfactory it might be as a momentary belief, it would lead to subsequent disappointment; and any future rise in the proportion of these deaths would induce the erroneous, but disheartening, supposition that your later sanitary steps had been less successful than the first. In all these matters, and especially in analysing the details of a death-registry, it is requisite (as I have already

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\* In the column referred to, this is concealed by the marked diminution, during the present year, of other disorders classed with infantile diarrhœa. Their reduction maintains the total of that column (notwithstanding the difference of diarrhœa) considerably less for this year than for last.

stated) to deal with cycles of many years. Periods of pestilence are habitually followed by periods of diminished mortality: partly because population is diminished, and especially that share of the population which suffers most from obviable causes of disease; partly because the great alarm of death has induced vigilance and precaution, public and private, against the occasions and beginnings of illness. And, beyond both these circumstances, there are others which we cannot analyse or explain, though we have scientific certainty of their operation; circumstances which seem to ensure a comparative quiescence of the ordinary causes of zymotic disease during those periods which next succeed the prevalence of certain fatal epidemics.\*

Nevertheless, that the sanitary condition of the City has undergone considerable improvement within the last two years is a fact which no one can gainsay; and that a considerable share of the mitigation in mortality arises from this improvement cannot reasonably be questioned. If even a third of the mitigation in question, if a reduction of ten *per cent.* on the preventable mortality of the City, may be inferred from the materials which I lay before you, it is indeed matter for the utmost congratulation; and a continuance of the same reduction year by year, perpetuated

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\* For the professional reader I may here throw out a hint—referring to the doctrine of epidemic disease stated in the Fifth Annual Report, that this apparent healthiness of districts after certain epidemic invasions probably bears relation to a temporary exhaustion of their zymotic atmosphere under the action of a specific ferment, and is in some respects analogous to that immunity from an infected fever which belongs to an individual who has recently suffered its attack. See also page 235.—J. S., 1854.

(as doubtlessly it may be) by a continuance of the same exertions, would soon raise the City of London above all fear of comparison, on the ground of healthiness, with urban or suburban populations.

Thirdly, I would beg the attention of your Hon. Court to those very important *local differences* of death-rate which may be deduced from a study of our death-register. I have already had the pleasure of citing to you the low rate of mortality which has prevailed during the last year in the north-west sub-district of the City of London Union. The rate of death in the north division of the West London Union was nearly double that proportion; and between these extreme terms of disparity there were many intermediate degrees.

Similar inequalities of mortality were observable in last year's record. In the healthiest sub-district of the City the year's death-rate was about 22 in the thousand; while in the worst it stood above 41; and for the whole West London Union exceeded 38.\*

Mainly and essentially these local differences of mortality depend on the proportion in which *preventable deaths* enter into the total; the differences, however partial, depending on the operation within certain districts, of removable deleterious influences which do not exist in certain other districts.

In classifying for your consideration the deaths which, during the last two years, have depended on epidemic, endemic, and infectious diseases, I have thought it desir-

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\* I have here availed myself of the corrections given in the note of page 6.

able to distribute them according to the municipal divisions of the City. Strongly believing, as I have endeavoured to express, that this class of deaths is for the main part preventable, I have thought it would interest the representatives of the several Wards, and would more directly enlist their sympathies for sanitary progress, if I could enable them at a glance to recognise the ratio in which their respective constituencies contribute to this annual death-roll. I have included in the table, under eight different heads, all those acute diseases which depend in an important degree on local causation, either for their existence or for their fatality. It will be obvious, even to the unprofessional reader, that local causes are not of equal prevalence in respect of all the diseases there tabulated. Some (as fever and cholera) would not be known at all under perfect sanitary arrangements; others (as scarlatina, measles, and hooping-cough) would be far less malignant in their attacks; others (as those classified in the tenth and twelfth columns) would no doubt exist under the most perfect physical circumstances, but would probably prevail in numbers quite inconsiderable as compared with those actually observed.

On consulting this table\*, it will be observed that in *Cordwainers' Ward*, during the last year, not a single death occurred from the causes referred to, and in the preceding year of epidemic visitation, only five; that in *Cornhill Ward* there have been only two such deaths in each of these years; that in *Coleman-street* they have been 66; in *Queenhithe*, 59; in *Portsoken*, 143; in *Aldersgate Within*, 30;

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\* Page 167.

in *Aldersgate Without*, 179 ; in *Cripplegate Within*, 80 ; in *Cripplegate Without*, 299 ; in *Bishopsgate Within*, 60 ; in *Bishopsgate Without*, 329 ; in *Farringdon Within*, 153 ; in *Farringdon Without*, 845.

I am unable to state with accuracy, in these several instances, what proportion subsists between the preventable mortality and the number of living persons, for I have no means of ascertaining precisely the population of the separate Wards ; and without this knowledge it is impossible to arrange them in a scale of comparative healthiness. I need hardly remind your Hon. Court that the Wards differ very considerably in their magnitude ; so that the largest majority of cases occurring in one Ward (as in *Farringdon Without*) must not unconditionally be taken to imply that the Ward, *in proportion to its population*, suffers more deaths than one in which the apparent number is less considerable. In the table to which these remarks refer, I have endeavoured to give you the means of comparing (at least approximatively) the healthiness of your several departments, by entering against the name of each Ward the number of holdings for which it stands assessed to your rate. This entry, with some trifling modifications specified in the table, may be taken to express the number of houses contained in each Ward of the City : thus it furnishes indirectly the means for estimating the local population.

It will be noticed, that the more glaring inequalities which I have adduced are in some degree due to the epidemic of last year, which did not press uniformly on all parts of the City. It may, however, likewise be observed, that the chief operation of that epidemic was to exaggerate,



but not importantly to misrepresent, the features of each locality; that the habitual sanitary proportions of districts to each other were for the most part preserved; that (with a qualification to which I shall presently revert) the Wards numbering fewest deaths last year numbered also fewest this year.

In my last Report, when the cholera had scarcely subsided, when men's minds were full of apprehension on the subject, and when it seemed only too possible that, with the recurrence of autumn, we might again suffer from its invasion, I was unwilling to dwell too pointedly on the wonderful pertinacity with which that disease fixes itself on particular localities, and tends to re-appear in them on each new occasion of its rise. Believing that no extemporaneous measures could counteract these local preferences of the epidemic, I refrained from a course which would have produced no good result (unless indeed it had depopulated certain spots of the City), and which might have caused unavailing and hurtful alarm. Now, however, I think it right to tell you that the local predilections of this dreadful disease are so marked and so obstinate, that we may almost certainly predict in what parts of the metropolis it would tend to arise on any renewed visitation. We may anticipate that at any such time its latent power of destruction will kindle again in the districts, the streets, the houses, perhaps even in the very rooms, where it recently prevailed, *unless the determining local conditions shall previously have been annulled.*

It would be ridiculous if I should pretend to carry you into any medical consideration of this subject, or should

make my present Report the vehicle of a professional argument; but I may very briefly acquaint you with such generalisations as will justify you in pursuing a particular course with respect to the haunts of cholera. While doing so, I hope your Hon. Court will believe that I have devoted to this very serious subject the best consideration of which I am capable, and have done my utmost to arrive at conclusions which may be fruitful of practical good.

Cholera visited no localities of which it could be said, that they were generally healthy; but still there seemed to be something peculiar and specific in the kind of local unhealthiness which determined its invasion. On the one hand, it is unquestionably true that many habitual seats of fever were visited by cholera; on the other hand, many of the worst fever-nests in the whole metropolis were unaffected by it; and it struck with extreme severity in a class of houses habitually exempt from fever. See, for instance, how malignantly it prevailed along the line of Farringdon and New Bridge streets, and in Fleet-street and Ludgate hill, where their line intersects that just mentioned; and here, you will observe, not only in those obscure and ill-ventilated courts and by-ways, where fever is the familiar visitant of a hungry and crowded population; but also, and very strikingly, in spacious and airy houses, situate along the main thoroughfare of the City, and inhabited by opulent tradesmen, by members of the various professions, or by officers of assurance-companies. Other infective diseases which habitually desolate the former class of dwellings are almost unknown in the latter. Cholera came as a startling exception. *Within the infected district* (fulfilling the clas-

sical description of pale death) it trod with equal foot the gates of rich and poor.\*

Personal peculiarities, or vicious habits, or temporary indiscretion, may often have determined its choice of a victim; low nourishment—even temporary emptiness and exhaustion, very manifestly invited its attack; but, speaking generally, I may say that it was a disease prevailing over a certain patch of ground, and (within this limit) tending to strike equally, or nearly equally, in all classes of habitations. Crowdedness of dwellings, defective ventilation, squalor of inhabitants, and many forms of local nuisance, which are omnipotent in giving occasion to fever, and in adding malignity to many disorders of its class, did not by themselves exert so marked and specific a power in determining the onset of cholera.

What then were the conditions determining its local preference? Consideration of its statistics, or inspection of a cholera-map, enables one, with some confidence, to answer—a peculiar condition of soil, of which dampness is one sure and invariable character, and organic decomposition (promoted by dampness) probably an-

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\* ——— *Æquo pulsat pede pauperum tabernas  
Regumque tures.*

I think it very important that this fact should be fully recognised. In London it has often been overlooked, from the accident that our most infectable districts happen to contain an excess of poor population. But even here it is quite easy to note that the disease spreads irrespectively of pauperism or privation; and in other cities, (Paris and Copenhagen, for instance) where the quarters of rich and poor are less apart than in London, cholera has killed its full share of dignitaries and capitalists.—J. S., 1854.

other.\* Its local affinities have much analogy to those of ague, and often appear identical in their range with the sphere of malarious infection. Our entire metropolis, built down to the very margins of a large river—of a river, too, which, at each retreating tide, exposes acres of mud saturated with the reeking sewage of an immense population, is placed generally in circumstances not unfavourable to the development of the disease; and its several parts will be liable to suffer especially, in proportion as they are exposed to these general circumstances, or to special circumstances of their own of a like nature. The lower level of districts on the south side of the river, their attendant failure of natural land-drainage, the consequent soddenness of a soil from which likewise the materials of house refuse were never efficiently removed, accounted sufficiently for the frightful epidemic mortality which prevailed in those quarters of the metropolis.

If you now look to the disease as it raged within your own jurisdiction, you will observe its fatality in two especial directions. First, in the line I have indicated to you, northward from Blackfriars Bridge, in a band of two or three hundred yards width; *there*, in the parallelogram which lies along the main road, from Stonecutter-street to Bridewell Hospital, were 76 deaths; *there*, in the little clump of houses forming the angle of Farringdon-street

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\* After three years' further inquiry I find no reason to modify this general description: but, as regards the local circumstances which determine the specified condition of soil and atmosphere, I have been able to extend my information; and the subject is therefore better treated in my Fifth Annual Report than in the paragraphs here following above.—J. S., 1854.

and Holborn-hill, were 17 deaths; *there*, in a square space behind twenty-seven shop fronts in Fleet-street, were 57 deaths; *theré*, in the small parish of St. Ann's, Blackfriars, were deaths at the rate of 25 to every thousand of its population. This was incomparably the most afflicted portion of your territory. Those who are acquainted with the ancient geography of the City will readily conjecture a reason; they will remember when 'the course of water running at London under Old-bourne bridge and Fleet bridge, into the Thames, was of such bredth and depth that ten or twelve ships, navies at once with merchandises, were wont to come to the foresaid bridge of Fleet, and some of them unto Old-bourne bridge;' they will remember how this broad river (like the Thames of our day) was thronged on both sides with population; how (again like the Thames) it was a draining river, probably with wide banks of putrefying mud; how many fruitless attempts were made to cleanse and preserve its channel; but how (in Stow's day) 'the brooke, by meanes of continuall incrochments upon the banks, and casting of soylage into the stream, was become worse cloyed than ever it was before.' Where that *soylage* was cast, and where, since the days referred to, so many habitations have arisen that no sign of stream remains visible to the wayfarer above ground, its traces still remain below. Throughout at least a large portion of this district, the sub-soil (your Surveyor informs me) consists of black mud, the bed of the ancient river, in which are set the foundations of the modern houses. The river, which centuries ago fulfilled for a large population those vile uses which now pollute the Thames, has gradually yielded its foul banks to the residence of a growing population; and

the sanitary relations of that population are exactly such as might be imitated, if the volume of the Thames were henceforth slowly reduced, and if those banks of mud which are now exposed only at low water, were simultaneously converted into the site of permanent habitations.

The history of the stream at Walbrook is, I believe, not dissimilar; but there is this marked difference between the two cases, that the comparative declivity of the latter district has allowed its soil to acquire a dryness and healthiness which have never been reached on the banks of the Fleet. For, owing to the extreme lowness of level in this district, the tidal influence of the Thames is very inconveniently felt; the cellars of houses are habitually exposed to dampness, even to flooding; and probably the whole porous subsoil, at least as far north as your jurisdiction extends, is maintained in a sodden and malarious state.

With respect to the second part of the City in which considerable groups of cholera cases were observed, it has a not dissimilar peculiarity. I refer to that northern part of the City which extends (on the other side of London Wall) from Bishopsgate to Aldersgate. The epidemic prevailed there with far less severity than in the Fleet district, but still with a preference which easily shows itself in a cholera-map. At the intersection of Whitecross-street by Beech-lane, in a space that the point of one's finger would hide in Wyld's large map, there were 12 deaths: in that small portion of the City which lies north of Barbican and Beech-street there were 40 deaths: in the immediate vicinity of Half-moon-street, Bishopsgate, 60 deaths, of which more than half were in the workhouse. Now, certainly, in all this space (and probably still further in both directions,

east and west) without the former gates of the City, there is a marked local character. It is a reclaimed marsh.\* Throughout this district, in the olden times of the City, there lay (says Stow) 'a moorish rotten ground, unpassable but for cawsuaies purposely made to that intent;' and one reads how 'divers dikes were cast, and made to drein the waters of the said Moorefields, with bridges arched over them, whereby the said field was made somewhat more commodious, but yet it stood full of noisome waters;' till gradually 'by divers sluces was this fenne or moore made maine and hard ground, which before, being overgrowne with flagges, sedges, and rushes, served to no use;' while 'the farther grounds beyond Finsbury Court were so overheightened with laystalls of dung, that divers windmills were thereon set, the ditches were filled up, and the bridges overwhelmed.'

It is not as matter of literary curiosity that I quote these passages of your old historian, but simply that I may avail myself of his accurate local knowledge for the explanation and the cure of a serious existing evil. For if, as I believe,

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\* I have reason to believe that this statement, though founded on the authority of Stow, is erroneous, for so much of the district as lies west of Moorgate-street; and that the main cause of this locality suffering so severely from cholera must have lain in those very extensive defects of house-drainage, which more recently I have become better able to appreciate. With the kind assistance of Mr. Haywood, I have been enabled to look over the memoranda which are kept in his office, of deep cuttings of soil made in the construction of sewers by himself and his predecessor, Mr. Kelsey. These sections do not by any means tally with Stow's description of the Moor, as extending in part 'from without the postern called Cripplegate, even to the river of Wels;' for here at least there is no trace of any such condition of soil.—J. S., 1854.

the unfortunate preference for certain localities evinced by the recent epidemic be, *primâ facie*, a reason for doubting the effectiveness of their sub-soil drainage, and if the ancient records of the City assure one that these very localities are such as, from conditions then in active operation, would be liable to retain, perhaps for an indefinite period, the materials of malarious poison, useful and practical deductions may be drawn. And as the liability to this severe recurrent epidemic is an extreme detriment to the population of such localities—one too, which, if unremoved, must inevitably lead to the deterioration of property, as well as to the sacrifice of life, I know that your Hon. Court will be solicitous to adopt whatever remedial measures are possible.

To those measures I shall presently return, having here dealt with the question only as it relates to the distribution of our mortality, and explains the preponderance of a large class of deaths in some special districts of the City.

In the Tables which accompany this portion of my Report, I have arranged in a synoptical form, convenient for reference, the chief facts of our sanitary statistics to which I have invited your attention.

In the first\* you will read a summary of the deaths as they have occurred, male and female, in the several districts and sub-districts of the City, during each quarter of the past year.

In the second† table the deaths of the year are classified according to the ages at which they befell.

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\* *Appendix*, No. IV.

† Now incorporated in the general table, *Appendix*, No. VIII.



In the third table,\* for the sake of comparison in respect both of general and of infant mortality, I have arranged the statistics of certain other localities side by side with our own.

In the fourth† (to which I have already especially referred) is contained an enumeration, according to the several Wards of the City, of those deaths, during the last two years, which have arisen in consequence of acute disease partially or entirely preventable.

In tables of this nature perfection is at present impossible; partly because of trifling changes in the population which often occur, but rarely can be estimated; partly because of the slovenly manner in which deaths are occasionally recorded. While, therefore, I would not consider myself responsible for their absolute and infinitesimal accuracy (consisting as they do of so many and so various details) I may assure your Hon. Court that all proper pains have been taken to render them for every useful purpose correct and trustworthy: and that I believe them, in all essential particulars, truthfully to represent whatsoever I have sought to embody in them.

The annual ratio of deaths within your district; the local differences of that ratio; the proportion of infantile mortality; the amount of preventable disease; and, in all these respects, a comparison of parts of the City with each other, and of the whole City with other inhabited districts,—these are the materials on which your judgment must be formed as to the necessity of sanitary measures, whether for the entire City, or for its component parts: and as a

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\* Now inserted at page 84.

† Page 167.

main object of the appointment which I have the honour to hold is that I should furnish you with materials for forming that judgment, so I may probably stand excused for troubling you with these considerations at such great length.

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## II. THE CAUSES AND THE PREVENTION OF ENDEMIC DISEASE.

ACCORDING to the method adopted in my last Annual Report, I now proceed to offer you such observations as another year's experience may justify, on those physical influences which prevail against life within the City of London, and on such remedial measures as seem aptest to remove them.

### *Sub-soil Drainage, House-Drainage, and Sewerage.*

1. In respect of drainage, I have already adverted to those unwholesome conditions which prevail along the low-lying valley of the ancient Fleet, and have mentioned to you that frequent incursions of the river aggravate whatever mischief is inherent in the soil, by maintaining it as a perpetual swamp, and by favoring in it a constant succession of putrefactive changes. I have likewise illustrated to you the probability that, in some of the higher portions of the City, chiefly in the Out-Wards of Cripplegate and Bishopsgate, there still survive some properties of that old malarious fen, from which these districts were originally

reclaimed. Stow seems in his day to have had misgivings on this subject; for after describing the improvements that had been effected there, and the gradual levelling and heightening of the ground, he adds, 'it seemeth to me that if it be made level with the battlements of the city wall, yet will it be little the dryer, such was then the moorish nature of that ground.'

From a consideration of this former geography of the place, and from observation of the diseases which prevail there, I am led to think it highly probable, that some of its sanitary defects depend less on defective house-drainage than on a still marshy undrained condition of the ground itself, and that these defects would be removed by an efficient application of sub-soil drainage.

I would therefore respectfully recommend to you, under this head, that the state of soil in the specified districts be referred to competent authorities, and that such measures be adopted as inquiry may prove requisite, for relieving those parts where the sub-soil drainage is imperfect, and for protecting the house-foundations, and sewers, and sub-soil adjacent to the river, from being soaked or flooded by the tide.

2. With respect to house-drainage, I have no addition to offer to those remarks which I submitted to you in my last Report. Your Hon. Court has fully recognised that immense peril to life which is connected with the presence of cesspools beneath houses, and which depends on their poisonous emanations. At the commencement of the present year, your Surveyor stated that he might take '5414, as a fair approximation of the number of cess-

pools' then in existence within the square mile of the City of London. This proportion, dangerously large as without doubt it is, presented an important diminution from the number which existed a year previously, when your Commission first obtained from the Legislature authority to enforce their closure; and it may reasonably be anticipated that at the termination of this present year, a still further abatement will be recorded in the magnitude of that destructive nuisance.

3. Notwithstanding the variety of stink-traps to which you have given trial, and notwithstanding the fact (recorded by your Committee of Health on the Surveyor's authority) that 'there does not exist within your jurisdiction a single gully which is untrapped,' there continue to be frequent complaints of offensive exhalations from the sewers.

The mechanical difficulties in this matter of trapping have appeared to be, from the nature of the case, almost insuperable. It may, indeed, easily be conceived, how incompatible are the common uses of a gully-hole with such fineness of adjustment and delicacy of balance as would render the apparatus air-tight from within, and effectually preclude an escape of the gaseous contents of a sewer. Under such circumstances, your Hon. Court has desired that I should express my opinion, how far a different course might be adopted in respect of these exhalations; how far, namely, they might be neutralised within the sewers; how far it might be chemically feasible, and in a sanitary point of view expedient, that a systematic use should be made of deodorising agents; so that any gas escaping from the sewers should at least be divested of its original smell.

On this subject, I would submit to you the following considerations. As respects its feasibility (putting aside as foreign to my province all questions of the expense, and all details of the daily arrangement) a first and obvious objection is this: Granted in the abstract, that sewer-gases can be converted by appropriate agents into inodorous compounds; in the practical application of these agents, you would find impediments with which you are already familiar. Theoretically, there may be no difficulty in providing air-tight traps; practically there is said to be every difficulty. Just as that mechanical problem has defeated you in practice, so would the chemical one; and for the same reason. The fulfilment of either problem is a matter of nice adjustment. In proportion as your gully-hole is exquisitely trapped, it becomes liable to obstruction; it loses its use as an inlet to the sewer, nearly in the same measure as it becomes an effective obstacle to regurgitant gases. Similarly, in proportion as these alleged deodorisers might succeed in completely stifling the characteristic odour of sewage, they would be liable to diffuse perfumes peculiarly their own, and to establish, in the vicinity of gully-holes, the alternation of a new nuisance with the old. To proportion with accuracy the introduction of these chlorinous preparations to the amount of refuse traversing the sewers—an amount varying most considerably at different hours of the day, seems to me quite a visionary hope. Failing such accurate proportions, I am not prepared to say that the result would be useful; and I accordingly consider the scheme as not chemically feasible.

Further—as involving an important sanitary principle, I would say, that the great object which must be aimed at is

not the mere chemical neutralisation of certain stinks which arise within your jurisdiction, but the closest possible limitation, and the promptest possible removal of all those materials which are decomposed into fœtid products. Admirable, no doubt, is that arrangement by which Nature, stationing a sense of smell at the inlet of our breath, cautions us by this vigilant sentinel against the inhalation of many poisonous airs; but, in respect of organic decomposition, I am in no degree satisfied that its odorous products are its only, if even its principal, agents of injury; nor have I any reason to suppose that the real detriment to health which arises from breathing the miasms of sewers or marshes, of cesspools, burial-grounds, or slaughter-houses, would in any important degree be lessened by the mere mitigation of fœtor in their effluvia. Offensive as these are, they at least answer the useful purpose of warning us against the other poisons with which they are associated.

Let me likewise take the opportunity of correcting a misapprehension, which, by the use of an inappropriate word, is sometimes shown to exist on this subject. The agents in question are spoken of as *dis-infectant*. As there is no scientific reason whatever for believing that they in any degree interfere with the spread of epidemic or infectious disease, and as an erroneous opinion on this point may lead to the neglect of measures which are truly precautionary and useful, I think it well to state explicitly, for your information, that I have no evidence of their possessing any other utility, in the respects under consideration, than simply and singly that of removing stink from the atmosphere around them.

For reducing to a *minimum* the exhalations which arise from sewers and house-drains, it appears to me that the following are the essential principles : First, to render the current through them as rapid as possible ; and, above all, by every care for their form, their junctions, their slope, and their material, to provide against the occurrence of obstructions and deposit : Secondly, to employ in their construction, so far as may be possible, such substances as are porous in the least procurable degree ; such as consequently will be least apt to imbibe and retain in their interstices any considerable impregnation from the fœtid fluids running over them at intervals ; such, too, as will be least likely to permit soakage into the surrounding soil : Thirdly, by reducing the size of drains and sewers to the lowest dimensions compatible with a full performance of their uses, to diminish to the utmost the extent of their interior evaporating surface, and of those large chambers which they now offer for the evolution, retention, and diffusion of gases.

To the application of these principles (together with a sufficient and appropriate distribution of water) far more than to chemical agents, or to the invention of mechanical traps, I believe that you must look for rendering inodorous the vicinity of your numerous gully-holes. I content myself with stating them to you, as a practical deduction from physical laws, without venturing to offer any opinion on the degree in which they are applicable within your jurisdiction, or on the manner in which they should be applied. For although, as principles, they have their foundation in physics, and although their importance to sanitary improvement is beyond measure great, all details relating to their

application lie out of my province, and belong to a class of subjects in which your Surveyor's opinion will, of course, be infinitely more useful to you than mine.

### *Water-Supply.*

During the past year, as in the preceding one, I have given frequent consideration to the subject of water-supply within the City.

I have already endeavoured to convey to you the deep sense which I entertain of its importance, and I have every reason to believe that your Hon. Court recognises, at its full weight, the necessity of providing for the City of London a supply of water which in quantity shall be ample, in quality pure, in distribution constant and accessible.

In my former Annual Report, and in some remarks subsequently addressed to your Committee of Health, I dwelt especially on such defects of our present system as relate to the quantity and distribution of water; endeavouring to illustrate the insufficiency of its supply to the poorer tenements of the City, and the extreme inconvenience which is entailed on their inmates, sometimes by dependence on a common tap, sometimes by the troublesome, expensive, and unwholesome necessity of storing water.

In reverting to this subject, I may correct a fallacy which is apt to prevail with respect to the abundance of supply. I have no reason whatever to doubt that a very liberal allowance of water is daily pumped into the City—enough, or more than enough, so far as I know, to fulfil all necessary purposes.

But those purposes are not fulfilled by it. A certain



large figure is stated as representing the average quantity daily driven through the mains of the City; this quantity is divided by the number of residents within your area, and the inference is drawn that each individual inmate of the City has at his disposal 25 gallons a day; or (after deduction for public purposes and the like)  $21\frac{1}{4}$  for his domestic supply. As an arithmetical conclusion from the premises this may be true: nothing can be less accurate as a practical representation of the facts. An average amount of three million gallons *per diem* may, or may not, be pumped through the mains of the City: but to calculate the *available water-supply* from this dividend, without previous deduction for the immense escape of *un-available water* by waste-pipes or otherwise, gives a most fictitious result. The large waste which naturally arises in the system of intermittent supply has been well illustrated by some evidence given by Mr. Lovick before the late Metropolitan Commission of Sewers, in respect of a particular block of nearly 1200 houses.\* Some of the houses were of the higher, and many of the poorer class, but the average might be stated to be of the middle class, and to present a fair example of an urban population. The drainage of all these houses was discharged through one main sewer. The run of water through this sewer was carefully watched and gauged every hour, during the night as well as the day, on days when the water was on, that is to say, when the intermittent supplies were delivered, and also on the ordinary days, when the consumption of the houses was from

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\* General Board of Health Report on Supply of Water to the Metropolis, page 120.

butts and cisterns, into which the intermittent supplies were delivered. The gaugings of the discharge of waste water into the sewer were checked by gaugings of the consumption of water from the butts and cisterns, during the interval of the delivery of the supply by the company. It was ascertained that the average quantity discharged *per diem* through the sewers was  $44\frac{1}{2}$  gallons per house; but it appeared that, on the days when the intermittent supplies of water were on, the quantity discharged *per diem* was 209 gallons *per* house. The waste in this district from defects in house apparatus of distribution, incident to an intermittent supply of water, was, on the water days, three and three quarter times greater than the consumption on those days.

No similar gaugings have, I believe, been made within the City; so I am unable to tell you with accuracy what are the proportions of waste and consumption. In an interview with your Committee on Health, when they were collecting information on the subject, Mr. Mylne, the engineer of the New River Company, stated (as a reason against fulfilling some object desired by the Committee) that within the City of London, in connexion with its distributing apparatus, there existed for the escape and waste of water, during the period of supply, 'at least 10,000 open cocks.'

Assuming the accuracy of this statement, I doubt whether the average available supply of water for domestic purposes within the City can possibly exceed a quarter of its alleged quantity; and I am persuaded that there must be large numbers of persons to whom the enjoyment even of that reduced average is utterly unknown. Your Hon. Court,

observing the incalculable waste, and knowing that the cost of water-supply (as of all other commodities) must of necessity vary according to the quantity supplied, can appreciate the consequences of so much fruitless expenditure.

I would beg likewise to observe to you that this unapplied flood of water is in itself not unobjectionable. It would be of questionable advantage if the drainage of the City were so perfect as to carry all away without inundation of the soil; while under opposite circumstances, in every quarter where drainage is absent or faulty, evil must arise from the extensive and habitual infiltration of moisture.

On the extreme inconvenience which attends the storage of water in the poorer habitations of the City, I have already reported to you, and will now only add that increased experience has given much confirmation to my view. Their receptacles are generally such as contribute to the contamination of water, and are constantly so arranged as to invite an admixture of the most varied impurities.

In the large proportion of them, which are open casks, one sees habitually a film of soot floating on the surface; one sees (if indeed one can see so deeply into water which is often turbid and opaque) that filth and rubbish lie at the bottom; one sees the interior of the cask itself dirty and mouldering.

I now merely glance at this part of the subject, because you have already on other occasions allowed me to state my knowledge at greater length. But there is one evil in particular to which I would beg leave to advert. Those works of drainage which are established under your orders depend for their efficiency on a proper supply of water; and

in every case where you enforce the construction of house-drains, you order that those drains shall be served efficiently with water. Your wishes on this subject are nominally complied with by those on whom your orders are served, but are often virtually evaded by a filthy and ineffectual contrivance. The butt or cistern of the house—that on which the inmates depend for their supply of fresh and pure drinking-water, is placed in immediate contiguity to the privy, so as to reduce the requisite length of connecting pipe to the fewest possible number of inches; the application of water is not made discretionary on the users of the privy, nor are any of the cheap and common self-acting contrivances introduced; but the waste-pipe of the butt or cistern is conducted into the discharge-pipe of the privy, so that, *periodically*, with a frequency varying according to the arrangements of the water-company, the arrears of excrement are removed, so far as the overflow of the water-receptacle may have power to dislodge and propel them. Frequent evidence has been before me of the insufficiency of this arrangement: and, in addition to its actual failure (on the reasons of which your Surveyor can speak more competently than I) there is strong reason to object to its prevalence on other grounds. Water, as you probably know, is a very active absorbent of many gaseous materials; and the open butts, which are thus placed in immediate contact and communication with privies, must rapidly become infected by their foulness. I need not explain to you how injurious an addition this is to the other objectionable incidents of water-storage, or how unattractive as a beverage to the poor inhabitants of the City must be this vapid, privy-flavoured stuff.

For this arrangement I can suggest to your Hon. Court no easy alternative or remedy, so long as the distribution of water continues to be on its present intermittent plan: but it is matter for extreme regret that, by circumstances over which you have no control, the success of your sanitary measures should be seriously diminished. By the enforcement or execution of house-drainage, your Hon. Court has conferred great advantages on many districts of the City; but it is my duty to tell you that, in my judgment, the present condition of the water-trade contributes to neutralise those advantages, and constitutes a restriction on your power of doing good.

As respects the evils to which I have just adverted, unquestionably they admit of abatement by devoting separate water-receptacles to the very different uses of diet and drainage. But the expense of additional cisterns in tenements so poor cannot be considered trifling; and I believe that your Hon. Court would hesitate, even if you have the power, to enforce this double burthen on the owners of house-property, at a time when one may reasonably hope that the necessity for cisterns will be superseded.

There can be no doubt on the extreme degree in which it is desirable for the poor of the City of London, that water should be delivered to their houses on the principle of constant supply, and that they should thus be relieved from the expensive and unwholesome necessity of storing it in small quantities and in improper receptacles. That it is *desirable* is a certainty within my official knowledge and on which therefore I can give an opinion of my own. That it is *practicable* is not within my official knowledge; for in this part of the question are involved various considerations of

hydraulic engineering, on which I am incompetent to offer an opinion. But I cannot ignore the fact, that in many parts of England and Scotland the practicability of a constant supply has been evinced by the very conclusive evidence of its success. To some such instances I alluded in my last Report, and from the present year I can quote you a striking additional one. At Wolverhampton, in 1849, the system of supply, which had previously been intermittent, was made continuous. Instead of waste ensuing on the change, its immediate effect was a reduction of 22 *per cent.* on the quantity consumed. So great had been the unpopularity of the intermittent system of supply, that at the time of the change the company had not more than 600 customers. Immediately on the adoption of the new system, their customers increased, and within ten months had risen to 1400. This increase was continuing up to the date of the Report (May 4th, 1850), at which time they were adding to the number of their customers at the rate of 50 each week. The above facts (as is well observed by the resident engineer, Mr. Marten) may be taken as a fair test that the system of continuous supply is one of superior adaptation to the domestic wants of the public.

This case is but an inconsiderable fraction of the evidence which lies before the public on the subject of continuous supply. With such evidence before me, in contrast to what I observe of the distribution of water within the City of London, I cannot refrain from repeating to your Hon. Court my confirmed and deliberate opinion that our method of supply is essentially bad, and that it withholds from the poorer population of the City a large proportion of those sanitary advantages which it is the object of water to confer.

No doubt it will occur to you that against evils of this nature—evils arising in the conflictive interests of water-buyer and water-seller, the first principles of commerce imply a resource; and that in this matter, as in others of the sort, a customer holds in his own hands the remedy for his dissatisfaction. But although the supply of water, in the hands of the powerful companies who vend it, is in many respects a common transaction of trade, and as such is in theory open to competition, yet I would beg to point out to your Hon. Court that, in regard of the City under your jurisdiction, no such check and no such stimulus as competition can virtually be said to exist. In every practical sense the sale of water is a monopoly. The individual customer, dwelling in Cripplegate or in Farringdon, who is dissatisfied with his bargain in water, can go to no other market; and however legitimate may be his claim to be supplied with this prime necessary of life at its cheapest rate, in the most efficient manner, and of the best possible quality, your Hon. Court, hitherto, possesses no power to enforce it.

All who have given impartial consideration to the subject seem to concur as to the advantages which result from a control over the supply and distribution of water being possessed by those who are responsible for the drainage and cleanliness of a district. These different duties are in such essential relation to each other that they would seem almost of necessity to require a single direction and control. House-drainage pre-supposes water-supply; water-supply pre-supposes house-drainage; the efficiency of either implies their mutual adaptation; just as the circulation of blood within an animal body implies uninterrupted continuity of arteries and veins, each harmonising with the uses of the

other, to ensure the efficiency of the whole. But while the works of drainage executed under your orders lose much of their sanitary usefulness for want of an effectual water-supply, your Hon. Court has no power of interference in the matter, closely associated as it is with the performance of your other functions. These anomalies would be removed, and a most beneficial power over the distribution of water would be vested in the hands of your Commission, if in the renewal of your Act of Parliament you procured authority to represent the citizens in this matter. All the advantages which could possibly be gained by competition, together with many benefits which no competition could ensure, would thus be realised to the population under your charge; if, namely, a clause were inserted in your Bill, empowering you, at your discretion, to contract corporately with any person or any company for the supply of water to the City of London.

In the Public Health Act (passed simultaneously with yours) an enactment of this nature exists, authorising local boards of health to 'provide their district with such a supply of water as may be proper and sufficient,' and for this purpose 'to contract with any person whomsoever to do and execute all such works, matters, and things as shall be necessary and proper, and to require that houses shall be supplied with water,' and to 'make and levy water rates upon the premises, at a rate not exceeding twopence *per* week.' With a power like this in your hands, you would easily enforce for the City of London whatever method of supply you might deliberately believe to be best; and you would then be enabled and entitled, in the application of other clauses in your Act, to require of landlords



acting under your orders, a far completer, though less expensive, improvement of their property than you are yet in a position to obtain.

In submitting to your Hon. Court my views as to the expediency of your having a controlling power over the supply of water, I am glad to find myself supported by the recorded opinion of the present Lord Mayor, himself formerly the Chairman of a Commission of Sewers; and I am induced to believe that such an addition to your functions might not be objectionable to the water companies, as I observe that Sir William Clay, the chairman of two metropolitan companies, has expressed himself strongly on its 'great and obvious convenience.'

2. Of equal importance with anything which relates to the distribution of water are those momentous questions which relate to its *quality*, and which tend to determine its fitness for human consumption.

Considering the great share of public attention which these questions at present very properly obtain, the many projects which are broached for improving the quality of our metropolitan supply, and the importance of your being in a position to decide as to the merits of any plan which may affect the City of London, I have thought it desirable in this Report to submit to you some general observations on the subject. During the last few months, I have accordingly been collecting such information as might, in my judgment, be useful for this purpose. In pursuing one portion of my inquiry—that which relates to the chemical constitution of certain waters, I have availed myself of the permission of your Hon. Court to procure a limited

amount of assistance from some one more conversant than myself with the practice of analysis. For this purpose I have addressed myself to Mr. Thomas Taylor, lately Lecturer on Chemistry at St. Thomas's Hospital, a gentleman on whose skill and impartiality I can implicitly trust. His account of the very careful analyses which he has made is subjoined to my Report.\* Concurrently with the experience of other chemists, it has furnished me with material for many of the conclusions which I am about to lay before you.

The water which is supplied by the New River and East London companies for the consumption of the City of London is substantially of one kind. The River Lea, on which the East London Company entirely depends, furnishes likewise much of the supply conveyed by the New River.† The springs in which the latter originate are of the same chemical kind as those which contribute to the Lea; and the artificial aqueduct runs its forty miles of course through much the same country as the natural river. Chemically, therefore, one description may apply to both; and I the rather speak of them conjointly, as any extension of its resources for our supply which the New River might obtain, would apparently be provided by increasing considerably its present draught from the Lea.

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\* See page 168.

† It appears that the New River Company at present derives about two-thirds of its supply from the River Lea, and proposes to draw from this source a still larger proportion. Any chemical difference of quality in the City pipe-water (as between that supplied by the New River and that by the East London Company) would probably not exceed those limits of difference which prevail in respect of waters gathered *under varying circumstances* from one and the same source.

The pipe-water consumed in the City has for its general chemical character, that it contains a considerable quantity of carbonate of lime, held in solution by an excess of carbonic acid. To this and another salt of lime (the sulphate) the water chiefly owes the property which is complained of under the name of *hardness*: it is by reason of these salts, namely, that it decomposes a certain large proportion of whatever soap is used with it; preventing the formation of a lather, till those salts are exhausted by a wasted proportion of soap, by boiling or otherwise, and hindering to that extent the several purposes for which soap is employed. You are probably aware that soda is extensively used in the laundry, as an antidote to this objectionable quality of hard waters; and the excess of its employment tends, by corrosion, very observably to hasten the destruction of washed articles of dress. In the same measure as water possesses the property of decomposing soap, its utility as an universal solvent is impaired; it extends to various other substances which one seeks to dissolve in it (especially to many vegetable matters) that same disposition to waste them in the form of insoluble precipitates. Its conveniences for the purposes of cooking and manufacture are *pari passu* diminished.

Of the actual extent of which these disadvantages are sustained within the City of London, I have no means of forming an exact opinion; but statements are before the public (from the general correctness of which I have no reason to withhold reliance and belief) rating the pecuniary loss to the metropolis, in the two articles of soap and tea, at a very high figure. You will see from Mr. Taylor's observations the proportion in which waste occurs, as

regards one of these articles ; namely that, for the production of a lather in washing, the pipe-water of the City of London, used without boiling, consumes from 13 to 19 times as much soap as distilled water would consume.\*

The chemical constitution of these waters occasions another inconvenience. Their carbonate of lime is held in solution (in the chemical form of bicarbonate) by an excess of carbonic acid : under the influence of heat this excess is gradually disengaged and driven off ; consequently, as they approach the boiling point, they begin to precipitate the earthy salt which that gas was instrumental in dissolving. Each gallon of water under these circumstances would deposit from ten to fifteen grains of earthy matter on the interior of whatever vessel might contain it, or on the surface of whatever solid—linen or mutton, might be contained in the boiler. Hence arises the well-known *furring* of vessels in which such waters have habitually been boiled.

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\* It has been alleged that, by the use of soft water, the saving in soap would probably be equivalent to the whole of the money at present expended on water-supply ; and that in the article of tea, the economy would amount to about one-third of the tea now consumed in the metropolis. It strikes me as possible that, in forming these estimates, the argument may have proceeded too much from a consideration of the hardness of London waters in their unboiled state ; and that sufficient allowance may not have been made for the change which boiling produces. If boiling were prolonged for some hours before culinary or detergent use of the water, the results (for tea or soap) would be identical with those produced under the employment of soft water. Notoriously this precaution is not taken : but to avoid disputable ground, I confine myself to *the fact of considerable pecuniary loss*, arising from the cause in question, and I avoid any attempt to determine its exact amount.

I refrain from dwelling on the economical considerations which arise in these points of the subject, as very obvious inferences from the result of chemical analysis ; and I pass to other matters more strictly within my own province of observation.

Is water thus constituted in any degree detrimental to the health of those who drink it? It is not in a single word that this question can be fairly answered. Almost insuperable difficulty belongs to it, from the absence of any statistical method by which we might isolate the water-drinking portion of our population, and might compare them, in regard of the diseases to which they are liable, with similar sections of population in soft-water districts and in harder-water districts. Obviously, no other method of comparison can be unobjectionable ; and, in arguing the subject from such materials as I have, I can pretend to nothing more than a rational approximation to truth.

Except in the comparatively few instances where active medicinal agents are naturally dissolved in a water, its effects, if injurious, would be so slow as to elude ordinary observation. If, as is exceedingly probable, the same constitution of water as impairs its solvency out of the body, do likewise operate against its being the most eligible menstruum or dissolvent for processes occurring within the body—such processes I mean as attend the act of digestion ; if the lime and other hardening ingredients which waste soap in our laundries, and tea in our parlours, do similarly waste within us those organic agencies by which our food is dissolved and converted ; any result arising from this source would be of gradual operation, would not easily admit of being traced to its source, and (except in suscep-

tible persons) would rarely produce such symptoms as might immediately draw attention to their cause. The ill effects (whatever they may be) arising from the use of hard waters must be looked for in chronic impairment of digestion, and in those various derangements of nutrition in distant parts (the skin and teeth particularly) which follow as secondary results on such chronic disorder. It would be ridiculous to look for the operation of an ill-chosen water, after its habitual use during two centuries, as though one were inquiring for the symptoms of an acute poison. The signs that are to be ascertained among a population, if such signs exist, are those which would evidence a premature exhaustion of the power of digestion, and would testify that the machine on which we depend for that power had been exposed to unnecessary and avoidable fatigue. This, I believe, is the utmost which Medicine, proceeding from theoretical grounds, would venture to say on the subject.

Perhaps I need not inform you that indigestion, with all that follows from it, is so frequent in the metropolis, in persons after the first strength of youth, that, for large classes of society, a perfect discharge of the natural process of digestion (such a discharge of it as a lecturer would describe to be the exact type and intention of Nature), is exceptional and rare. Unquestionably, in large numbers of cases, wine and beer and spirits, rather than water, have to do with this effect. Unquestionably, other influences of metropolitan life—and, not least, the mental wear and tear which belong to its large excitement, contribute immensely to this chronic derangement of health; but there are reasons

likewise for believing, that the quality of water consumed is not a matter of indifference to the result. We cannot but give it an important place among those influences of health or unhealth which we consider *local*; and we cannot refuse to recognise the fact, that in recommending our patients (as we do often recommend them) to try 'change of air' for complaints which baffle us by their obstinacy, so long as the subject of them remains in London, the course on which we rely for success implies 'change of water,' equally with that other change to which more popular importance is attached.

In illustration of this view, I may quote to you the experience of two other towns. Dr. Sutherland stated, in evidence before the General Board of Health, that having lived for a number of years at Liverpool (where the water is said to be of about the same degree of hardness as ours), he had long entertained a conviction that 'the hard water, in a certain class of constitutions, tends to produce visceral obstructions; that it diminishes the natural secretions, produces a constipated or irregular state of the bowels, and consequently deranges the health. He had repeatedly known these complaints to vanish on leaving the town, and to re-appear immediately on returning to it, and it was such repeated occurrences which fixed his attention on the hard selenitic water of the new red sandstone as the probable cause, as he believed it to be, of these affections.' (Rep. p. 51). And Dr. Leach, of Glasgow, stated before the same Board, as the result in that town of two years' experience of a substitution of soft for hard drinking-water, that in his opinion, 'dyspeptic complaints had become di-

minished in number;’ and that it had ‘been observed, since this change, urinary diseases have become less frequent, especially those attended by the deposition of gravel.’

Inferences useful for ourselves cannot be drawn from statements like the above, on the fullest assumption of their accuracy, without comparing the waters referred to with our own, more completely than is done by the one characteristic of ‘hardness;’ and there may likewise be other qualifications requisite for an application of the analogy. But those disorders of health which are specified by the gentlemen quoted, as produced by the use and diminished by the disuse of hard waters, are such as might very probably stand in the relation of effect to their alleged cause; results, namely, primary and secondary, of disordered digestion.

Practically, I may tell you, that there are many individuals whose stomachs are extremely sensitive to the impression of hard water, who derive immediate inconvenience from its use, and who refuse to drink it without artificial reduction of its objectionable quality. I may likewise inform you that a physician, recently deceased, whose knowledge of indigestion and its chronic effects (especially in relation to the skin and urinary organs) was most profound and accurate, and whose consulting practice in such disorders was for many years almost a monopoly (I mean Dr. Prout) was in the habit of enjoining on his patients the use of distilled water. He evidently considered that the consumption of such waters as are habitually drunk in the metropolis was detrimental, at least to an enfeebled digestion. This is an opinion which, I have reason to believe, is generally entertained by medical practitioners in London.



It may not be irrelevant to mention to you (since the influence of imagination or of artificial habits can have little to do with this result) that horses are liable to be much inconvenienced by hard water, if unaccustomed to its use; and it is, I believe, notorious that grooms in charge of racers habitually take the trouble of conveying with them, to their temporary racing stables, a supply of the accustomed water. Veterinary surgeons say that under the continued use of hard water, which horses will avoid if possible, their coats become rough and staring;—an effect, I may observe, analogous to those skin-disorders of the human subject which are apt to occur from impairment of the digestive functions.

Taking into account all these considerations, together with others of a more technical description; and believing that water is eligible for human consumption in proportion as it is free from the admixture of any material foreign to its simple elementary constitution—exception being made only of so much dissolved air as will render it sparkling and palatable; I entertain no doubt that a water, devoid of considerable hardness, would (*cæteris paribus*) for the purposes of cooking and drinking, be far preferable to that which the companies now distribute through the City of London.

Hitherto, however, I have spoken of the waters supplied to the City, merely as regards that large impregnation of earthy material which they gather from their source; and I have criticised them only in respect of that admixture. Their essential chemical quality is one native to the soil from which they are derived; and whatever censure thus far belongs to them could only have been avoided by

the selection of a different source. Chemistry, in the days of Morrys and Myddleton, was not sufficiently advanced to inform the water-merchants of a city on those different conditions which determine the fitness of a soil to serve as the natural or artificial *gathering-ground* of a supply; and by which (as they vary in different localities) hardness is imparted to the rain-fall of one district, while softness is preserved for that of another.

But there are other evils belonging to these waters, less appreciable indeed by chemistry, but open to universal observation, and meriting unqualified blame. They are conducted to the metropolis in open channels; they receive in large measure the surface-washing, the drainage, and even the sewage of the country through which they pass; they derive casual impurities from bathers and barges; they are liable to whatever pollutions mischievous or filthy persons may choose to inflict on them; and then on their arrival in the metropolis (after a short subsidence in reservoirs, which themselves are not unobjectionable) are distributed, without filtration, to the public. Whatever chemistry may say on this subject (and I need not remind you of very powerful causes of disease which lie beyond its cognisance), I cannot consider it matter of indifference, that we drink—with whatever dilution, or with whatever imperfect oxidation, the excremental and other impurities which mingle in these sources of our supply. Such admixtures, though in their *quantity* less, are in their *quality* identical with those which render Thames-water, as taken at London Bridge, inadmissible for domestic consumption, and which occasion it, when stored for sea-use, to undergo, before it becomes fit to drink, a succession of offensive changes strictly comparable to putrefaction.

In this slovenly method of conveyance and distribution there is a neglect of common precaution for the purity and healthfulness of the supply, which I must report to you as highly objectionable: and this—the method of supply to our great metropolis, strikes one the more with astonishment and disgust, as one reflects on the long experience and admirable models which past centuries in foreign countries have supplied; and especially, as one remembers those colossal works which, more than two thousand years ago, were constructed under the Roman government, for the cool and cleanly conduction of water.

The present imperfections of knowledge forbid me to cite, as definite causes of disease, the contaminations to which I have adverted: I cannot say to you—pointing to our classified list of sickness and mortality, *this* depends on drinking the diluted drainage of Hertford, *that* on the contributions of Ware. Indeed I know that, under the influence of the river and the atmosphere, very considerable changes occur in the materials thus furnished, tending eventually to render them inert; and if injury to life occur from their ingestion, it is probably only under peculiar and exceptional conditions, increasing their quantity, or delaying their oxidation. In protesting against their continued distribution as articles of diet, I therefore insist less on inferences deducible from medicine, and shall probably have the concurrence of your Hon. Court in grounding my appeal on the common principles of taste.

On the incidental contaminations to which the pipe-water consumed within the City becomes liable, by reason of its storage in receptacles both foul in themselves and surrounded by causes of foulness, I have already addressed you; and I have shown to you the dependence of this evil

on the system of intermittent supply as adapted to the houses of the poor.

Of other sources of water-supply existing within the City of London, there are many of small extent in the form of superficial springs. These are eagerly sought after, sometimes from a distance, on account of their coolness and sparkling condition. In the Appendix\* you will find an account of one of these waters—that in the vicinity of Bishopsgate church, which is very much drunk in that quarter of the City. Any praise given to it illustrates exceedingly the fallacy of popular judgment on such subjects, and shows how easily those qualities of coolness and freshness, which are absent from stored waters, impose on the palate, and induce a preference to be given to waters which are relatively most objectionable.

The chemical faults which belong to our London pipe-water are possessed in a far greater degree by this water of Bishopsgate pump, and the latter has moreover some vices which are absent from the former; but the vapidity and fustiness of water which has been stored in cisterns are so repugnant to the taste, that the water chemically preferable is not in practice preferred.

To the use of waters of this description, within a large city, there is always much objection. In addition to extreme hardness, which in London they universally possess, they are liable, in a dangerous degree, to become contaminated by the leakage of drains, and by other sources of impurity; as, for instance, where situated within the immediate vicinity of grave-yards they derive products of animal

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\* See page 170.

decomposition from the soil.\* Very recently, a celebrated pump within the City of London, that adjoining St. Bride's church-yard, has been abandoned on account of such impregnations. Or perhaps I should rather say (for the difference again illustrates the readiness with which the palate is deceived or corrupted) that it was not *abandoned*—for till almost the last moment the neighbours adhered to it with fondness; but the parochial authorities—alarmed by the proximity of cholera—caused its handle to be locked.

As an available source of supply to the City of London, the use of deep (Artesian) wells has been recommended: the clearness and softness of these waters, together with their freedom from organic matters, having concurred to suggest their employment. I feel bound to express the strongest opinion against the fitness of these waters for the purpose of beverage. They uniformly contain a considerable proportion of medicinal ingredients; they are capable of exerting definite and demonstrable influence over the natural actions of the body; and information is before me of various injury to health, affecting large numbers of

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\* This is illustrated in the analysis of Bishopsgate pump-water, just alluded to. The very large quantity of *nitrates*, there referred to that water, must be due to the oxidation of human bodies in the adjoining soil, which serves in part as gathering-ground to the spring. I should fear that, during rain-fall, this oxidation of organic compounds may not always have completed itself, and that materials of decomposition *still in progress of decay* may thus often be mingled in the water. [I have lately had occasion to recommend that the use of Aldgate pump should be discontinued on account of its water containing, in addition to a large quantity of alkaline nitrate, so much unoxidised organic matters, as were sufficient to give it a foul taste.—J. S., 1854.]

persons, arising from the continued dietetic use of such waters.

In addressing your Hon. Court on the subject of water-supply for the City, it is impossible that I should do otherwise than advert to the fact, that, during the last few months, under the auspices of Her Majesty's government, as represented for sanitary purposes by the General Board of Health, a plan has been gradually maturing itself, for the supply of the entire metropolis with pure soft water. Founding itself on very extensive investigations as to the qualities of water, as to the influence of soils on its chemical composition, as to the relation between streams and rain-fall, as to the hydraulic principles of distribution, and the like, this plan proposes to gather water in certain silicious soils, which can impart to it the least possible admixture of foreign ingredients; to conduct it in closed channels, with every precaution for its perfect purity; and to distribute it throughout the metropolis, at a rate which shall be from 30 to 50 *per cent.* less than our present water-charges. The proposed area for the collection of this supply is in the extensive range of sandy soil in the south of Surrey, extending around Farnham, about ten miles in each direction. Since the publication of the first Report made on this subject by the General Board of Health, unremitting inquiry has been advancing, under their direction, into all details of the plan; and the Hon. William Napier, who, with others, has been engaged in the investigation of the proposed sources, has advocated an important modification, which promises to reduce very considerably the anticipated expense of the undertaking. The essential and most important principles which governed the Board, in arranging

their plan, were, first, to seek their supply in a silicious soil, where little soluble material could exist for its contamination; secondly, to take possession of the water so near to its source that all its original purity might be preserved; and, during conduction, to isolate it from those contaminations which are incidental to the onward passage of a stream through miles of promiscuous country. To fulfil these indications, there were two conceivable courses; and studious local inquiries could alone determine which of them was preferable: on the one hand, if the streams which represent the natural drainage of the country should be found uniformly pure and copious, they might admit of being conducted bodily into the artificial river of supply: on the other hand, it might be requisite to carry the interference of art still further, to absorb the filtering moisture of this large sand-district before it had become confluent into streams, and thus from day to day, by extensively ramified works of artificial sub-drainage, to derive immediately from the soil, the varying contributions of rain-fall and dew. The Board, apparently solicitous for the completer security of their plan, preferred to estimate its cost on the latter very expensive supposition; they allowed apparently for the diffusion of drain-pipes over 150 square miles of country, and for a reservoir which should contain storage of water equivalent to a very long metropolitan consumption. The later examination, made by Mr. Napier and confirmed by others, tends and appears to show, that these large sources of expense may be avoided; that the waters may be collected of unusual purity and softness, where they have united themselves into rivulets of considerable volume; that the gauged and estimated discharge of these rivulets is sufficient day by day

for the needs of the metropolis, according to the largest construction of those needs; that capillary drain-pipes and very extensive storage-room may thus be dispensed with; and that under the modification of arrangement suggested by these facts, some very large reduction might be inferred for the total estimate of this comprehensive plan.

Many of these particulars are already before the public; but in a matter of so much importance to the health of the City, as that of participating in a supply of pure water, collected and distributed on the soundest principles, and sold at the cheapest rate, I did not think it would become me, as your Officer of Health, to remain an indolent auditor. I have felt it my duty to inform myself, so far as I could, on the real merits of this scheme, and on its probable relation hereafter to the sanitary condition of the metropolis. I have spent three days on the site of the proposed sources, and many other days in informing myself on all the bearings of the subject. I have likewise collected water from a proposed tributary of the future supply, which has been analysed, and which shows (as my Appendix will illustrate to you) a remarkable and rare excellence. On one occasion of visiting the country, I was accompanied by Mr. T. Taylor, and we made on the spot a sufficient number of extemporaneous examinations, to assure us that the essential features, shown in the more elaborate analysis, are (as geological considerations would lead us to believe) the general characters of water throughout the district.

On any other than the sanitary relations of this subject I can have nothing officially to say; but, confining myself to these relations, I may certify to your Hon. Court that the water in question is, in my judgment, of a quality admi-



rably suited for domestic purposes; that its distribution through the City of London would conduce to the health and comfort of the population; and that the principles, proposed by the Board for its collection and conveyance, appear to me such as sanitary science, in its present condition, should counsel for the water-service of the metropolis.

There is, however, one aspect of the subject which must not pass unconsidered. Water that is free from earthy ingredients requires a peculiar distributory apparatus. If conveyed in leaden pipes with access of air, or if stored in leaden cisterns, it corrodes the metal of which they are composed, and is liable to derive from this source an impregnation very hazardous to life. Under certain circumstances, especially under alternations of air and water (such as occur in the intermittent supply), or where organic impurities are held in solution or suspension, or probably where from any cause uncombined carbonic acid is present, even the hardest waters are not free from this risk. Speaking generally, however, it affects soft water chiefly; distilled water most of all: and the Farnham water (in common with all pure water) is decidedly liable to this empoisonment, if used with leaden apparatus of conduction and storage. In my Appendix you will find some interesting particulars on this head; and you will observe that with experiments conducted by Mr. Taylor in imitation of the constant supply (*i. e.* with total submersion of the metal) the formation of carbonate of lead in the Farnham water was exceedingly gradual. This concurs with the alleged experience of Aberdeen, where it is said by Professor Clark to have been found (to my mind, by a somewhat dangerous trial) that pure and soft water, *distributed on the principle of constant*

*supply*, does not exert on the leaden pipes any action injurious to the health of the population. You will likewise observe, that when hard water, as at present employed in the City, is softened by boiling, it acquires this property of pure water, and becomes capable of acting on lead; and here is an important observation, as it has been proposed by similar artificial means, employed on a very large scale, to soften all the water now distributed in the metropolis.

Obviously, as regards one and all of the many proposals for supplying water destitute of hardening ingredients, any chemical process, or any change of source, which might lead to the distribution of such pure water through the metropolis, could not be considered as a single and separate reform, but must be undertaken conjointly with such alterations in the distributive arrangements as might be requisite for removing from the new plan *any chance, however slight or remote, of injuring the population by metallic poison.*

What those alterations must be, it would now be premature to decide. The experience of Aberdeen might seem to suggest, that the system of constant supply (on all other accounts so eminently desirable for the metropolis) would, in itself, if accompanied by the total disuse and prohibition of leaden cisternage, give sufficient security against the danger in question; or, on the other hand, further inquiry may show it to be quite indispensable for a safe distribution of the new supply, that leaden pipage should be entirely superseded by the use of some non-metallic material, as earthenware or glass. Should this change become necessary, its adoption would no doubt be facilitated by the comparative cheapness of these preferable materials.

*Offensive or injurious Trades.*

With respect to offensive or injurious trades and occupations pursued within the City of London, you were reminded by your Committee of Health, in their Report of March 26th, 'that upon your attempting to put in force the powers of your Act of Parliament in reference thereto, it was found that considerable difficulties were opposed to your efforts. Sufficient powers (the Report proceeds to say) are not given by the City of London Sewers Act to meet some of the cases alluded to, while other legal and technical objections presented themselves to the enforcement of the powers in question.' The Committee concluded their Report by 'pointing out to you the necessity, when the question of renewing your Act should come into consideration, of procuring additional powers which may enable you effectually to remedy those evils.'

On the grounds thus expressed by your Committee, I avail myself of the present opportunity for bringing the subject again under your notice.

In my former Report I spoke particularly of those trades and occupations which deal with animal substances liable to decomposition; and in expressing my knowledge of their danger to the health of an urban population, I argued that no occupation which ordinarily leaves a putrid refuse, nor any which consists in the conversion or manufacture of putrescent material, ought, under any circumstances, to be tolerated within a town. To that subject I now revert, only to assure your Hon. Court that the past year has given me no reason to alter my opinion. But the trades to which I wish, on this occasion, more especially to request your attention, are those which are complained of on the ground

of their offensiveness, rather than of their injury to health—as nuisances rather than as poisons. During the year, I have received a very considerable number of complaints of this nature; some of them perhaps frivolous, but many well-founded and reasonable.

At the head of this class of evils stands the flagrant nuisance of smoke. Those members of the Court who have visited foreign capitals where other fuel than coal is employed, will remember the contrast between their climate and ours—will remember (for instance even in Paris) the transparence of air, the comparative brightness of all colour, the visibility of distant objects, the cleanliness of faces and buildings, instead of our opaque atmosphere, deadened colours, obscured distance, smutted faces, and black architecture. Those, even, who have never left our metropolis, but who, by early rising or late going to rest, have had opportunities of seeing a London sunrise, can judge, as well as by any foreign comparison, the difference between London as it might be, and London as it is. Viewed at dawn and at noon-day, the appearances contrast as though they were of different cities and in different latitudes. Soon after day-break, the great factory shafts beside the river begin to discharge immense volumes of smoke; their clouds soon become confluent; the sky is overcast with a dingy veil; the house-chimneys presently add their contributions; and by ten o'clock, as one approaches London from any hill in the suburbs, one may observe the total result of this gigantic nuisance hanging over the City like a pall.

If its consequences were confined to rendering London (in spite of its advantages) the unsightliest metropolis in Europe, to defacing all works of art, and rendering domestic cleanliness expensive, I should have nothing officially to say

on the subject; but inasmuch as it renders cleanliness more difficult, and creates a despair of cultivating it with success, people resign themselves to dirt, domestic and personal, which they could remove but so temporarily: or windows are kept shut, in spite of immeasurable fustiness, because the ventilation requisite to health would bring with it showers of soot, occasioning inconvenience and expense. Such is the tendency of many complaints which have reached me, and of their foundation in truth and reason I have thorough conviction and knowledge.

I would submit to your Hon. Court that these evils are not inconsiderable; and that beside the injury to property (with which I have nothing to do) the detriment to health, if only indirect, claims to be removed. Yet, while I am cautious to speak of this latter injury, as though it were only indirect—only by its obstruction of healthy habits, I ought likewise to tell you, that there are valid reasons for supposing that we do not with impunity inhale day by day so much air which leaves a palpable sediment; that many persons of irritable lungs find unquestionable inconvenience from these mechanical impurities of the atmosphere; and (gathering a hint from the pathology of vegetation) that few plants will flourish in the denser districts of London, unless the air which conduces to their nourishment be previously filtered from its dirt.

If the smoke of London were inseparably identified with its commercial greatness, one might willingly resign oneself to the inconvenience. But to every other reason against its continuance must be added as a last one, on the evidence of innumerable competent and disinterested witnesses, that the nuisance, where habitual, is, for the greater part or entirely, voluntary and preventable; that it indicates mismanage-

ment and waste; that the adoption of measures for the universal consumption of smoke, while relieving the metropolis and its population from injury, would conduce to the immediate interest of the individual consumer, as well as to indirect and general economy. For all the smoke that hangs over us is wasted fuel.

The consumption of smoke in private houses is unfortunately a matter to which hitherto little attention has been given; and it would be vain to hope that the reform should begin with those, whose individual contributions to the public stock of nuisance are comparatively trifling. With the progress of knowledge on these subjects, a time will undoubtedly arrive, and at no distant period, when chimneys will cease to convey to the atmosphere their present immense freight of fuel that has not been burnt, and of heat that has not been utilised; when each entire house will be uniformly warmed with less expenditure of material than now suffices to its one kitchen fire; and our successors\* will wonder at the ludicrous ingenuity with which we have so long managed to diffuse our caloric and waste our coal in the directions where they least conduce to the purposes of comfort and utility.

But, while the arrangements of private establishments

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\* To the philosophical thinker there would seem to exist no important difficulty which should prevent the collective warming of many houses in a district by the distribution of heat from a central furnace—perhaps even so, that each house might receive its *ad libitum* share of ventilation with warmed air. Ingenuity and enterprise, in this country, have accomplished far more arduous tasks; and I little doubt that our next successors will have heat-pipes laid on to their houses, with absence of smoke and immense economy of fuel, on some such general organisation as we now enjoy for gas-lighting and water-supply.—J. S., 1854.

may, perhaps wisely, be left to the operation of this spontaneous reform, I would venture to recommend in regard to furnaces, employed for steam-engines and otherwise for manufactures within the City, that you should endeavour to control the nuisance of smoke.

The members of your Hon. Court are probably cognisant of the great mass of evidence on this subject, collected by two separate committees of the House of Commons, and of the almost unanimous conclusions to which that evidence led; 'that opaque smoke issuing from steam-engine chimneys may be so abated as no longer to be a public nuisance; that a variety of means are found to exist for the accomplishment of this object, simple in construction, moderate in expense, and applicable to existing furnaces and flues of stationary steam-engines; that a sufficient body of evidence has been adduced, founded upon the experience of practical men, to induce the opinion that a law, making it imperative upon the owners of stationary steam-engines, to abate the issue of opaque smoke is desirable for the benefit of the community;\*' 'that the expense attendant on putting up whatever apparatus may be required to prevent smoke arising from furnaces is very trifling, and (as some of the witnesses observed) the outlay may be repaid within the year, by the diminished consumption of fuel; that the means of preventing smoke might also be applied to the furnaces of steam-boats, but such application would be attended with rather more expense than on land, from the occasional want of space, and the setting of boilers in a steam-vessel. No doubt, however, existed, in the opinions of those examined,

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\* Report of Committee, 1845.

that the prevention of smoke could be accomplished in steam-vessels.”\*

In two local improvement Acts (those of Leeds and Manchester) clauses have been introduced in accordance with the sense of these conclusions; and in order to render them as little oppressive as possible to those whose interests might be affected by their operation, the enactments (which apply to every variety of furnace) have been so framed as to enforce penalties for the issuing of smoke only when it should appear (as no doubt it commonly would appear) that the proprietor had refrained from “using the best practicable means for preventing or counteracting such annoyance.”

Surely if such applicable means exist, it is a just and reasonable thing that the public should be defended against offence and injury, arising in the mere indifference or obstinacy of those who inflict them; and I venture to hope that your Hon. Court, in renewing your application to Parliament, may procure the enactment of a clause, giving you control over so much of the nuisance as is wanton and avoidable.

There are still under the present head, some points to which I am anxious to advert. During the two years that your Act has been in operation, various complaints have been made with respect to nuisances arising in particular trades; and with many of the causes of complaint you have been unable effectually to contend. Soap-makers, tallow-melters, gut-spinners, naphtha-distillers, preparers of patent manure, dealers in soot, exposers of stinking hides, wire-

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\* Report of Committee, 1849.



makers, dealers in kitchen-stuff, fish-curers, tripe-boilers, type-founders, gold-refiners, slaughterers, varnish-makers, roasters of coffee and chicory, whalebone-boilers, iron and brass-founders, keepers of cattle-sheds, makers of printing-ink, dealers in camphine, cooks of cats'-meat, and manufacturing chemists, have all, at different times and in various degrees, been complained of.

In respect of those of the enumerated trades which deal in the manufacture or sale of organic materials in a putrid or putrescent state, I have already submitted to you my opinion that the City of London, the home of a large and crowded population, is no place for them. With regard to the many other occupations, it would obviously be absurd, in the present state of society, to think of banishing them from the City which their industry has contributed to enrich, and where immemorial custom has given sanction to their continuance, unless you could with certainty affirm of them, that they cause direct and inevitable detriment to their neighbourhood. Every useful purpose, as regards the health of the City, might be fulfilled by the enactment of some moderate restriction.

Manifestly, it is opposed to the spirit of your Act of Parliament, that any trader or manufacturer should possess the right of diffusing in the vicinity of his house, to the detriment and disgust of his neighbours, any product (whether in the form of running fluid, or volatile dust, or vapour, or smoke, or odour) which is either disagreeable to the senses or may be hurtful to the health. Many of the instances which I have enumerated fall within this description, and yet remain unaffected by the restrictive sections of your Act.

I would submit to the consideration of your Hon.

Court, whether, in the renewal of your Act, some comprehensive clause might not be introduced, which should deal with these difficulties, as well as with the nuisance of smoke—and deal with them, too, on the same principle: a clause, which (without enumerating all trades which have been, or possibly may become, sources of nuisance in the City, and without specifying too narrowly the nature of the nuisances to be guarded against) should empower your Commission generally, in respect of every trade practised within the City, to require that its operations shall be conducted with the least possible amount of inconvenience to the neighbourhood; and which should enable you to enforce penalties in case of every nuisance arising in such operations, unless it should be distinctly shown on the part of the proprietor, that every practicable measure for abatement of the inconvenience had been constantly and thoroughly employed.\*

I would beg to express my conviction that your possession of the authority with which such a clause would invest you, would very largely increase your powers of utility, in respect of many acknowledged grievances hitherto beyond your control; and the influence of your example, in the achievement of this great municipal purpose, would, I doubt not, speedily lead to the adoption of general measures throughout the metropolis, for the total suppression of smoke, and for the mitigation of other nuisances which now exist around your territory no less than within it.†

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\* Such a clause was introduced in the Act of 1851 (see page 193) and has been worked with considerable advantage.—J. S., 1854.

† This expectation has recently been fulfilled in the Smoke Prevention Act, for which the metropolis has to thank Lord Palmerston.—J. S., 1854.

*Burial-Grounds.*

In my last year's Report I had occasion to represent to your Hon. Court the evils of intramural sepulture. I testified to that large accumulation of human remains, by which, in numerous parts of the City, the soil of burial-grounds has been raised many feet above its original level; and I advised you of the injury which must accrue to health from the constant organic decomposition thus suffered to proceed in the midst of our crowded population. I likewise invited your attention to the still greater evil of burial in vaults; I explained and endeavoured to remove the misconception which commonly prevails, as to the preservation of bodies under those circumstances; and I showed you how unfailingly, sooner or later after such burial, the products of putrefaction make their way from within the coffin (whatever may have been its construction) and diffuse themselves offensively and injuriously through the air. I concluded by expressing to you my strong conviction of the necessity that some comprehensive measure should be undertaken, for abolishing, at once and for ever, all burial within the City of London.

During the session of Parliament that has intervened between that Report and my present one, an event has occurred, which promises to remove effectually the evils on which I then addressed you. Her Majesty's government, acting at the instigation of the General Board of Health, carried through Parliament a Bill, enacting that the Queen, by Order in Council, may prohibit further burials within any district of the metropolis, so soon (after the close of this year) as the General Board of Health should have pro-

vided the means of extramural interment. The operation of this Act of Parliament is such as, I have every reason to believe, you will welcome within the City of London: and I look forward to the complete cessation of burial within your territory, as a matter for warm congratulation among all who are interested in the cause of sanitary improvement.\*

From the terms of the Act in question I find that Her Majesty's Order in Council is to be preceded by a Report from the General Board of Health, stating their opinion of the expediency, that (in any particular case reported on) burial should forthwith be discontinued. Accordingly, in the present state of the law, it will devolve on that Board to initiate whatever measures may be necessary for the prohibition of further interment in the City.

Two clauses of your Act of Parliament, which have hitherto been inoperative, may perhaps come into requisition whenever Her Majesty's Order in Council closes the burial-grounds of the City; viz., clause 89, which empowers your Commission, if you shall "think fit, to provide fit and proper places, in which the poor, under proper rules and regulations, may be permitted to deposit the bodies of their dead previous to interment;" and the following clause, which authorises your Officer of Health, in case of necessity, and for protection of the living, to cause any dead body to be removed at your expense, to whatever building may have been provided for the reception of the dead, previous to interment. It may hardly be necessary that I

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\* The Act of Parliament here referred to never passed into operation, and was repealed in 1852 by a second Metropolitan Burials Act, under which the City Commissioners of Sewers are at present acting as a Burial Board for the City of London. See the last Reports of this Volume, from page 280 to the end.—J. S., 1854.

should trouble you with any remarks on the subject of these clauses, till such time as they are likely to come into operation.

With respect to the burial-grounds within the City, which will fall into disuse so soon as the new Interment Act becomes operative, I trust that your Hon. Commission will procure the power of regulating and supervising their maintenance, so that they may no longer be hurtful to the health of their vicinity. The arrangement of them, which would be most advantageous to their locality, would be that of planting them with whatever trees or shrubs may be made to flourish in a London atmosphere. The putrefactive changes, which for some years longer must proceed in these saturated soils, will be rendered comparatively harmless and imperceptible, if at the same time there advance in the ground a sufficiency of vegetation, which for its growth would gradually appropriate, as fast as they are evolved, the products of animal decay.

It seems almost superfluous for me to observe, that, from the time when burials are discontinued, no unnecessary disturbance of the soil should be allowed ; nor any attempts at levelling or the like, except under the direct sanction of your Hon. Court.

Another point in connexion with these burial-grounds, to which I may here advert (though I must recur to it hereafter) is, that while great advantage may be expected from the discontinuance of their former uses, if their several areas be left open and without building, so as to subserve the ventilation of their neighbourhood, all that advantage would be lost, and a heavier evil inflicted on the neighbourhood than that of which it purports to be relieved, if these

spaces were at any time to be covered with houses; and I trust it may be found within the province of your Hon. Court to obtain authority for preventing any encroachment of this nature on the limited breathing-spaces of the City.

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### *Habitations and Social Condition of the Poor.*

In my last Report (under its fifth and sixth heads) I particularly solicited the attention of your Hon. Court to certain circumstances connected with the dwellings and habits of the poor, which, though they then lay apparently out of your jurisdiction, as defined by the Act of Parliament, yet appeared to me of immeasurable weight in the sanitary fluctuations of the City, as tending in their operation constantly to thwart your endeavours for improvement, and to neutralise day by day whatever good you could achieve.

I reported to you that there were sanitary defects, inherent in certain large proportions of your municipal cure, which the most absolute control of drainage and water-supply would do nothing to amend,—constructional defects of houses and of courts, whereby their crowded inhabitants were excluded from a sufficiency of light and air, and were constrained, without remission or change, to breathe an atmosphere fetid with their own stagnant exhalations. I reported to you that, however unexceptionable might be the arrangement of such localities in matters already within your control—however clean their pavements, however pure their water, however effective their drainage, yet fever and the

allied disorders could never be absent from their population ; while under opposite arrangements, with nuisances around them, with organic poisons rising from the soil or mingling in the water, their mortality would rise to the horrors of pestilence, and might easily renew the most awful precedents in history. I described to you the class of miserable dwellings alluded to—‘Courts and alleys with low, dark, filthy, tenements, hemmed in on all sides by higher buildings, having no possibility of any current of air, and (worst of all) sometimes so constructed, back to back, as to forbid the advantage of double windows or back doors, and thus to render the house as perfect a *cul-de-sac* out of the court, as the court is a *cul-de-sac* out of the next thoroughfare.’ I affirmed that ‘this could never be otherwise than a cause of sickness and mortality to those whose necessities allot them such residence;’ and assured you of the ‘incontrovertible fact, that subsistence in closed courts is an unhealthy and short-lived subsistence, in comparison with that of the dwellers in open streets.’

In habitations of this kind the death-rate would of necessity be high, even if the population were distributed thinly in the district. A single pair of persons, with their children, having such a court for their sole occupancy, would hardly be otherwise than unhealthy; the infants would die teething, or would live pallid and scrofulous; or a parent would perish prematurely—the father, perhaps, with typhus, the mother with puerperal fever. Judge then, gentlemen, how the mortality of such courts must swell your aggregate death-rate for the City, when I tell you that their population is in many instances so excessive, as, in itself, and by its mere density, to breed disease.

Statistics can give you no conception of this crowding. If you refer to the results of the last census, you find the average population *per* house, in the City of London Union to be 7·1; in the East and West London Unions, 8·8; for the construction of these averages, the most dissimilar materials are blended together; and the density of population is apparently reduced by the very large number of business-houses which have no resident inmates, beyond the porter or the housekeeper who has charge of them. If you turn from the deceptions of an average to the exact analysis of detail, you will find many single rooms in the City with a larger number of inmates than you might otherwise ascribe to entire houses. Instances are innumerable, in which a single room is occupied by a whole family—whatever may be its number, and whatever the ages and sexes of the children; where birth and death go on side by side; where the mother in travail, or the child with small-pox, or the corpse waiting interment, has no separation from the rest.

This is evil enough; but worse remains behind. It is no uncommon thing, in a room of twelve feet square or less, to find three or four families *styed* together (perhaps with infectious disease among them) filling the same space night and day—men, women, and children, in the promiscuous intimacy of cattle.\* Of these inmates it is nearly super-

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\* I purposely refrain from any attempt to illustrate all the horrors which are incidental to this method of life; but, as a single exemplification of the text (chosen, not because of its rarity, but because it happens to occur at the moment) I insert an extract from a note, with which I was favoured a fortnight ago, by Mr. Hutchinson, Surgeon to the North District of the West London Union: ‘I was



fluous to observe, that in all offices of nature they are gregarious and public; that every instinct of personal or sexual decency is stifled; that every nakedness of life is uncovered there. Such an apartment is commonly hired in the first instance by a single pair, who sub-let a participation in the shelter, probably to as many others as apply. Sometimes a noxious occupation is carried on within the space: thus, I have seen mud-larks (*chiffonniers*) sitting on the floor with baskets of filth before them, sorting out the occasional bit of coal or bone, from a heterogeneous collection made along the bed of the river, or in the mouths of the sewers; and this in a small room, inhabited night and day by such a population as I have described.

Who can wonder at what becomes, physically or morally, of infants begotten and born in these bestial crowds?

In my former Report, I drew your attention to this pestilential heaping of human beings, and suggested to you its results; and on many occasions, during the past year, complaints have been before your Hon. Court which have had their real origin in this uncontrolled evil. I revert to it because of its infinite importance. While it maintains physical filth that is indescribable, while it perpetuates fever and the allied disorders, while it creates mortality

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sent for to attend a poor Irish woman in labour, at half-past six o'clock yesterday morning, at 17, Fox and Knot court. There were three families, each consisting of a man and wife and two or more children, in a small room, 15 feet by 8, all lying upon dirty rags on the floor. I found one of the children suffering under small-pox. The adjoining room was occupied by six grown-up persons and two children.' In the circumstances to which my Report refers, scenes of this description must of necessity be *habitual*: and it is to their habit, not to their exceptional occurrence, that my remarks apply.

enough to mask the results of all your sanitary progress, its moral consequences are too dreadful to be detailed. I have to deal with the matter only as it relates to bodily health. Whatever is morally hideous and savage in the scene—whatever contrast it offers to the superficial magnificence of the metropolis—whatever profligacy it implies and continues—whatever recklessness and obscene brutality arise from it—whatever deep injury it inflicts on the community—whatever debasement or abolition of God's image in men's hearts is tokened by it—these matters belong not to my office, nor would it become me to dwell on them. Only because of the physical sufferings am I entitled to speak; only because pestilence is for ever within the circle; only because Death so largely comforts these poor orphans of civilisation. To my duty it alone belongs, in such respects, to tell you where disease ravages the people under your charge, and wherefore; but while I lift the curtain to show you this—a curtain which propriety might gladly leave unraised, you cannot but see that side by side with pestilence there stalks a deadlier presence; blighting the moral existence of a rising population; rendering their hearts hopeless, their acts ruffianly and incestuous; and scattering, while society averts her eyes, the retributive seeds of increase for crime, turbulence, and pauperism.

While I refer to these painful topics, I may remind your Hon. Court of the Report of your Committee on Health, in respect of the same heads in my previous communication, and may strengthen myself with their testimony: 'We feel it due to Mr. Simon to add, from the result of personal investigation, that the statements contained in his Report under this subject, distressing as they are, are not exag-

gerated:' and, as regards whatever I may have recapitulated from that Report, I would beg leave to add, that my experience during the past year has confirmed the opinions which I then expressed; assuring me more and more, that the correction of these crying evils must advance simultaneously with the other labours of sanitary reform.

Recently, while having the honour to attend your Committee of Health in their deliberations on your Act of Parliament, I have submitted to them, as my view of what is desirable for legislation on the subject of my present section, substantially the same suggestions as I formerly laid before your Hon. Court. As their recommendations must shortly come before you for consideration, and as I entertain the deepest conviction that the subject is of paramount importance to the cause in which you are interested, I have hoped you would excuse my recurrence to it, and my brief repetition of those suggestions which the incompleteness of your Act of Parliament has hitherto prevented your adopting.

1. There are within the City some blocks of houses which are, I fear, irremediably bad and pestilential from such errors of construction as I have already described; and which, further, are so dilapidated, as to show at a glance their little pecuniary value. In many instances the destruction of such a block of houses would confer a sensible advantage on the population of a considerable district. Of this class I could hardly give you a better illustration than would be seen in the ground-plan of Seven-step alley. There are other instances (frequent in Cripplegate) where the removal of a single house at the extremity of a court or passage would make a material difference to the ventilation

of several houses, and to the health of a numerous population.

2. Again, in very many parts of the City, you find illustrations of a constructional error to which I have adverted as in the highest degree pernicious to health. You find a number of courts, probably with very narrow inlets, diverging from the open street in such close succession, that their backs adjoin with no intermediate space whatsoever. Consequently, each row of houses has but a single row of windows, facing into the confined court; and thus there is no possibility of ventilation, either through the court generally, or through the houses which compose it. In the Out-Wards of Cripplegate, Farringdon, and Bishopsgate, examples of this arrangement are both most numerous, and I believe, most removable: but they may likewise be found in considerable numbers in the In-Wards of the City; *e.g.*, in the neighbourhood of Printing-house-square, of Great Bell-alley, of Leadenhall-street, of Aldgate, of Skinner-street, and of St. Martin's-le-Grand.

In many of these cases, if the management of the property were under a single control, it is possible that effectual relief might be given, by converting any two rows of houses which are back to back, each having windows only on one side, into a single row of houses, with doors and windows both before and behind: and if changes of this nature were accompanied by the removal of an occasional house, or other impediment to the circulation of air, I would guarantee to your Hon. Court that the next year's register would show a very large diminution in the local amount of preventable sickness and mortality.

3. In other cases, the immediate impediment to ventila-

tion apparently consists in the operation of the window-tax. Your Hon. Court, at various times, has heard how unfortunate for the health of cities is this ill-chosen method of taxation, assessing the amount of rate for houses in proportion to their means of ventilation. You can easily conceive how much it would impede your endeavours to promote health and cleanliness within the City, if an additional direct tax were levied on houses by reason of their *drainage*; or if the assessor regulated his rate according to the *consumption of water* for household purposes. The working of the window-tax is on this principle; and although it may be very true that health is the greatest of treasures, and that, on this ground, its means and appliances are eligible for taxation, I cannot but regret that a struggling population should be tempted by the hope of some small saving, to make a sensible diminution in their chances of life, by retrenching within the narrowest measures their inlets of ventilation and light.

In reference to the more important constructional errors which I have described to you, as affecting the courts and alleys of the City, it will be obvious, from the remedies which I have suggested, that no hope of alteration can be expected from landlords. To throw together the adjoining houses of two different courts, or to remove one house for the advantage of certain others, or to destroy a whole block of houses for the sake of its neighbourhood, could evidently be undertaken, as a matter of private enterprise, only where property of very considerable extent, and close juxtaposition, happened to be in the hands of a single individual; and, as regards the City of London, this is rarely or

never the case. The only manner, then, it occurs to me, in which the requisite remedies could be applied, would be through the wealth and benevolence of the Corporation. If there were vested in your Hon. Court (or in any other authority of the Corporation) the power to make compulsory purchases of house-property, on the ground of its unfitness for human habitation, it would be easy to correct the extreme errors which exist; and, under a single large landlordship of this nature, it might not improbably be found that measures such as I have described would give to the localities in which they might be effected as much improvement in value as in health. After the necessary alterations, such houses would no longer need to continue under tenure of the Corporation, and the proceeds of their sale might again be applied to the reclamation of similar property in other parts of the City.

In throwing out this suggestion to your Hon. Court, I, of course, do not pretend to offer you any details for its realisation. These can more fitly be supplied by others; nor should I have introduced even this general mention of a plan, but for the vividness with which its practicability and usefulness have struck me. During my period of office, I have seen distinctly that what seems incurable in the dark intricacies of our worst courts and alleys often depends for its difficulty on the *number* of landlords, and on their mutual independence. The conviction had thus been forced on me, which I have endeavoured briefly to express to you; that the only available cure for such evils would consist in the Corporation assuming to itself (if only for a time, and in gradual succession) the proprietage of such wretched tenements, and fulfilling towards them those large and liberal duties of

landlordship, which now remain unperformed through the multiplicity and neediness of petty owners. And, as a precedent for one species of such improvement, I may mention to your Hon. Court, that in such property as I have described to you, situated in other parts of the metropolis, private societies have already effected purchases which have enabled them to convert bad and unwholesome residences into the form of model lodgings for the working classes.

Before leaving the consideration of evils, in which over-density of building and defective ventilation form such important parts, I would avail myself of the opportunity to observe, that it is of incalculable importance to preserve, for the health of the City, every open space which at present exists. The density of buildings within the City of London Union is very great, and in the East and West London Unions, is very considerably greater than in any other part of the metropolis; and not merely are the houses closely packed together, but (as I have already described them) very thickly inhabited. Within the City of London Union, each human being, on an average, has less than an eighth part of the space he would have if residing in the district of Islington; and, small as is this pittance, it is more than double what he would enjoy if he were living in the district of the East and West London Unions. With such density of population, it would, of course, be advantageous if any space now occupied by buildings should hereafter become vacant, so as to increase the breathing-room of the neighbourhood; and your Hon. Court will see the imperative necessity of discountenancing, so far as may be, the erection of additional houses on the few unoccupied spaces which remain. In order to do this effectually, it would be desir-

able to procure the enactment of a clause, giving you absolute prohibiting power in this respect, whenever, for sanitary reasons, you might think it right to interfere.

With respect to those evils which I have set before you, as arising from the unrestricted accumulation of persons of both sexes, and of all ages, within a single sleeping-room—dreadful as they are, I do not consider them irremediable. In the first place, I would beg you to observe, that the very restricted definition of a ‘lodging-house’ given in your Act of Parliament, has hitherto rendered it impossible, in any degree, to regulate dwellings of the description referred to. An amendment of that definition might bring them within your control, and might enable you, not only in these instances, but in many others, to restrict the numbers of inmates, to compel the removal of persons with infectious disease, and to enforce provisions of decency, cleanliness, and ventilation.

Not, however, alone to restrictive and compulsory measures do I look for the social improvement of numbers, now so destitute and miserable. That our entire industrial population within the City might, in such respects, gain great advantage from an enlightened supervision and guidance, I formerly endeavoured to show. I sought (from other experience) to illustrate the benefits they would derive, not only from your exercising habitual inspection, and possessing a more extensive control, in many matters relative to their dwellings and mode of life; but likewise, from the establishment, under the auspices of the Corporation, of institutions which, raising before them a higher standard of civilisation, would improve their social habits by an indirect educational influence, and would elevate the general tone and character of their class.



On the subject of Model Dwellings for the labouring classes, and of Public Baths and Wash-houses, as illustrating this view, I dwelt at some length in my former Report; and, deeply convinced of the boon which their establishment would confer on the poor, I explained, to the best of my ability, the nature and the extent of their usefulness.

I now recur to the subject, only that I may repeat my profound conviction of its importance; and that in doing so, I may congratulate your Hon. Court, and may utter my deep thankfulness for the labouring and suffering poor of this great community, that, in compliance with the Standing Orders of Parliament, formal notice has been given on the part of the Corporation of the City of London, of their intention, in the approaching session of the Legislature, to apply for authority which may enable them to achieve, for their dependent fellow-citizens, this almost incalculable good.\*

I cannot too strongly express the importance I attach to this implied intention of the Corporation, to establish model dwellings for the industrial population of the City. But the first and immediate operation of such an Act will, from the nature of things, hardly reach to those very destitute and degraded classes of which I have spoken. Model lodgings of the ordinary character will become the residence of men, who now pay from two to five shillings a week for such space as they occupy, and who have the habit of sleeping in beds. To them the gain will be very great;

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\* The intention of the Corporation, here spoken of, has not hitherto been carried into effect.—J. S., 1854.

and the example of improved domestic habits will be beneficial to their entire class. But among the lowest order which I have described to you, as it subsists in thronged and pestilent heaps within your worst quarters, there is little knowledge of beds. The first hirer of the room may possibly have a pile of rags on which he lies, with his wife and children, in one corner of the tenement; but the majority of his sub-tenants (paying for their family-lodging from six-pence to ten-pence a week) lie on straw, or on the bare boards. It will be obvious to you, that no *Model Lodging-house* could be reduced to the level of their means. By those restrictions to which I have adverted, something may be done, no doubt, for improving the arrangement of houses so tenanted—something to prevent the more glaring outrages of decency which at present prevail—something to maintain comparative cleanliness, and to check the spread of disease. I fear that no further remedy than this would prove effectual, unless it were universal for the metropolis. Unquestionably, it would be possible, with persons even of the lowest sort above pauperism, to proceed on the same principle as in the establishment of model-lodgings for the working orders; to provide for them, namely, under respectable control and supervision, the best accommodation which their price could purchase, of the kind to which they have been habituated; to give them the means of lying down, free from damp or cold, partitioned from one another, and with isolation of sexes, in a building constructed or arranged for the purpose, where the ventilation and the facilities for cleanliness might be complete. There seems little room to doubt that this might be done, on a very large scale, at a rate considerably less than the poorest now pay

for the right of lairage amid vermin, filth, obscenity, and fever; and with such dormitories, obviously, there might be connected other arrangements for giving comfort and cleanliness to the very poor and destitute, at the lowest possible price. Of gratuitous reception I do not speak, because that is already provided, under certain regulations, in all the work-houses of the metropolis. But while I conceive that such a measure, if generally adopted throughout London, would defray its own cost, and would remove evils and miseries horrid to contemplate, I cannot but feel that it would be inadmissible (in its cheapest form) as a local measure. For if the price of reception—for instance, here, were so low as to allure the wretched population in question from their places of present resort within the City, it cannot be doubted that its influence would extend beyond your jurisdiction, and would throng your dormitories with the destitute of other districts. As the evil is metropolitan, so ought the remedy to be; and if there were thus instituted within each Union of the metropolis, a *Ragged Dormitory* of the nature described, I am persuaded, from my knowledge of the poorest classes, that its establishment would be of infinite advantage in improving the habits, and diminishing the mortality of those who would become its inmates.

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### III. SUGGESTED ALTERATIONS IN THE ACT OF PARLIAMENT.

FINALLY, gentlemen, considering that you are about to procure a renewal of your Act of Parliament, and that you contemplate strengthening it with such additional clauses as may render it effective for the eradication of all preventable disease within the City of London, I would ask permission, in this point of view, to submit to you in a connected series, such modifications as in my judgment would contribute to that purpose. Most of these I have already had the advantage of suggesting to your Committee on Health; and to many of them I have adverted by anticipation, in previous passages of my Report. I would beg to enumerate the *desiderata* under the following heads, *viz.*

1. A clause, which would give you control over the supply and distribution of water, would enable you in your corporate capacity to contract with any person or any company for the total service of the City; and would authorise you to defray the expenses of such contract by certain specified rates.

2. A clause empowering you to require, that every trade or manufacture practised within the City shall be carried on with such precautions, and with such available improvements, from time to time, as shall reduce to the lowest practicable amount whatever nuisance or inconvenience to the neighbourhood is apt to arise therefrom.

3. Such change in the definition affixed to your 91st

clause as would render this operative for the regulation and improvement of a larger number of houses; and such addition to the clause as would enable you, on the joint certificate of your Officer of Health and Surveyor, to enforce the making of additional windows, where requisite for the proper ventilation of houses.

4. A clause permitting and empowering you, on sufficient medical testimony, to remove, or to call upon the Board of Guardians to remove, from any lodging-house, within the new definition of your Act, any person diseased with fever or other infectious malady, whose continuance there would endanger the lives of other inmates.

5. A clause prohibiting the occupation of under-ground cellars for the purposes of dwelling.

6. A clause prohibiting the keeping of cattle in or under dwelling-houses.

7. A clause vesting in the Commission a right to purchase houses by jury valuation, in any case where they shall determine that such houses are permanently unwholesome and unfit for human habitation, or that their alteration or removal is necessary for the public health.

8. A clause enabling the Commission to control all further encroachments on spaces which are now open within the City; so that on ground now unoccupied by buildings, no future erection shall be made, except with the sanction of the Commission.

9. A clause to protect the purity and wholesomeness of human food, as sold within the City, by affixing penalties to its exposure for sale in any adulterated, decayed, or corrupted condition, which may impair its fitness for consumption.

These are the heads under which it has appeared to me that the most useful additions might be made to your Act of Parliament, in matters within the scope of my official observation. There are some other minor modifications, which I have submitted to your Committee of Health, and which, as they relate merely to detail, it is unnecessary for me to bring before you. All the recommendations which I have made on this subject result from a careful scrutiny of the operation of your present Act, during the two years that I have had the honour of serving you. Each separate paragraph of my enumeration founds itself upon a distinct recollection of occasions, sometimes numerous, wherein, for want of such enactments, nuisances which you were anxious to suppress have eluded your authority, or advantages which you were desirous to realise have stood beyond your attainment.

It was in the nature of things that this should be so; for the period has been one of experiment. When the City Sewers Act became law for a period of two years, every one interested in its success must have felt the advantage of that limited duration, and have rejoiced in the opportunity, thus afforded, of rendering it eventually the most perfect embodiment of sanitary law.

Parts of the Act have abundantly fulfilled your intention. In the all-important particular of house-drainage—in the enforcement of water-supply, so far as circumstances rendered possible—in the effective preservation of exterior cleanliness—in the abatement of innumerable nuisances—in the provision and maintenance of sewerage and paving and lighting throughout the City—the public has seen your Hon. Court exercising very large powers with very unusual

success. And this, let me add, during a time of no ordinary difficulty: a time when, day by day, the vast importance of sanitary improvement has been gaining ground among the educated classes of the country, as a deep and settled conviction; a time when the feelings of all classes have been powerfully excited, and when the metropolis especially has been convulsed with alarm, in the anticipation and in the aspect of a pestilence.

In some other respects the Act has been less operative, and for an obvious reason. To legislate for health was new to you. It was only through the gradual investigation of officers, appointed under the Act, that you could become adequately informed of those sanitary requirements on which your ultimate legislation for the City must found itself. Only by their slow experience, only by failure as well as by success, was it possible that correct knowledge could be obtained of the powers really needful for fulfilling your sanitary intentions.

In carefully watching the fluctuations of health amid your population; in investigating the causes which determine them; and in testing, on every occasion, how far these causes are amenable to the control of your Act of Parliament, I have arrived at the conclusions submitted to you in the present and in my previous Report.

To excuse the length at which I have addressed you, I have but another word to say. My apology consists in the assurance, which again I lay before you, that in spite of all your exertions, untimely and preventable death still prevails most largely in the population under your charge. If the deliberate promises of Science be not an empty delusion, it

is practicable to reduce human mortality within your jurisdiction to nearly the half of its present prevalence.

It is the sad prerogative of my Profession to have such knowledge of death as cannot lie within your experience. Knowing all that is implied in each one separate instance of its visitation—how much pain and sorrow, often how much bereavement and destitution, we, perhaps better than others, learn to appreciate that vast amount of social misery which has its symbol in the high death-rate of a population. It is from this practical point of view that I have ever estimated the importance of your functions, and have fixed the obligations of my own humbler office. Notwithstanding all that Medicine can achieve, to succour the body as it struggles against actual disease—notwithstanding those resources of drugs and handicraft, by which the physician or surgeon opposes death or mitigates pain in the detailed exercise of his art, all past experience, and every transaction of our daily practice, confirm the popular adage that *prevention is better than cure*. If this be true in any particular case, much more is it true in the largest application. While *Curative Medicine*—ministering step by step to the individual units of a population, can produce only minute and molecular changes in the health of society; Sanitary Law, embodying the principles of *Preventive Medicine*, may ensure to the aggregate masses of the community prolongation of life and diminution of suffering: in the working of some single enactment, it may affect the lives of generations of men, and may moderate in respect of millions the sources of orphanage and poverty.

Surely, it is no common epoch in the history of the metropolis when you are appealing to the Legislature, on



behalf of the Corporation, for the grant of additional powers towards the accomplishment of so great a beneficence. To me it has always been an act of the deepest and most anxious responsibility to address you ; and it would ill have become me now, in the attempt to discharge so grave a duty, if I had spared any pains or withholden any conviction.

While endeavouring in this, and in my previous Report, faithfully and in detail to depict for you the actual condition of human life within the City, and while seeking to deduce for you, from reason and experience, those sanitary principles which are applicable for its improvement, I have had no trivial or easy task ; and you will pardon me, I hope, both if I have incompletely surmounted the difficulties of so large a subject, and if, by the length of my Report, I have made too great claims on your indulgence.

I have the honour to remain,

&c., &c.

## Note to Column I.

Speaking generally, this column may be taken to express the number of houses in each Ward. Exception must be made, however, in respect of the four wards marked with asterisks; for in them the real number of houses somewhat exceeds the number of assessments. This discrepancy depends on the fact that, in the specified wards, a court containing several houses is often assessed by composition as a single property. Mr. Daw informs me that in order to correct on this score the numbers which stand opposite the Wards in question, addition should be made as follows:—to Bishopsgate Without, 80—raising its number to 1100; to Cripplegate Without, 150—raising its number to 1112; to Farringdon Without, 100—raising its number to 3633; to Portsoken, 150—raising its number to 1408. This would raise the total number to 16,384, which is about the estimated number of houses in the City. From the results of the last census it appeared that the population of the City was distributed as follows:—within the district of the City of London Union on an average of 7·1 persons to each house; within the district of the East and West London Unions on an average of 8·8 persons to each house.



Letter by Mr. THOMAS TAYLOR, Lecturer on Chemistry at the Medical School of the Middlesex Hospital, on the Chemical Qualities of certain Waters.

4, Vere-street, Oxford-street,  
November, 1850.

DEAR SIR,

HAVING, by your desire, submitted the following samples of water to chemical analysis, I now beg leave to lay before you the result; and also, at the same time, to reply to certain questions which you likewise proposed.

The samples of water taken for examination were derived from the following sources:—

- A. Water supplied by the New River Company.
- B. Water supplied by the East London Company.
- C. Water from a spring in the neighbourhood of Haslemere, Surrey.
- D. Water from a well in Bishopsgate-street.

A. This water was taken from an upright pipe in a court-yard of the Guildhall. It was slightly opalescent, inodorous, and tasteless; numerous small particles floated in it, which took a considerable time to subside. The matter deposited was of a rust colour, and consisted of peroxide of iron, with a little sulphate and carbonate of lime, and organic matter. It is to be observed that, as the water from this pipe is seldom used, these impurities collect in the pipe, and are therefore in some measure accidental, although, prior to collecting the water, a considerable quantity had been allowed to run away. The water was allowed to free itself from these impurities by subsidence, before being submitted to analysis.

By evaporation to dryness, an imperial gallon left a solid residue, weighing 17·33 grs., which consisted of—

|   |       |
|---|-------|
| Carbonate of lime, with a little oxide<br>of iron . . . . . | 11·12 |
| Carbonate of magnesia . . . . .                             | 0·60  |
| Sulphate of lime . . . . .                                  | 1·56  |
| Chloride of sodium . . . . .                                | 2·40  |
| Silicic acid . . . . .                                      | 0·37  |
| Organic matter . . . . .                                    | 1·19  |
|   | <hr/> |
|   | 17·24 |

When heated, this water became turbid; and, by continued boiling for two hours in an apparatus so arranged that the whole of the steam was condensed and returned to the water, 10·95 grs. of the earthy carbonates, coloured by oxide of iron, were deposited.

The relative hardness of this water, as determined by the soap test, distilled water being taken as unity, was 13·3.

B. The second sample of water was taken from a small tap in the house of Mr. Hall, Bishopsgate-street. The tap was attached to the main.

This water was without smell or taste, and free from floating matter. After standing some time, it deposited a very small quantity of oxide of iron. Although clear and transparent, it was not bright.

It contained 19·10 grs. of solid matter in the imperial gallon. The solid matter consisted of—

|   |       |
|---|-------|
| Carbonate of lime, with a little oxide<br>of iron . . . . . | 14·58 |
| Carbonate of magnesia . . . . .                             | 0·44  |
| Sulphate of lime . . . . .                                  | 1·54  |
| Chloride of sodium . . . . .                                | 1·71  |
| Silicic acid . . . . .                                      | 0·32  |
| Organic matter . . . . .                                    | 0·72  |
|   | 19·31 |

Like the preceding water it became turbid when heated to the boiling point, and by continued ebullition for two hours, 12·90 grs. of carbonate of lime, coloured by oxide of iron, were precipitated.

Hardness in reference to distilled water as unity = 19.

C. This water was taken by ourselves from a spring-head near Haslemere, Surrey. The spring issued from the foot of a low sand-hill covered with bushes, and was received into a natural basin about four or five feet in diameter, the bottom of which was lined with pebbles and small gravel. From this basin the water flowed into a large shallow pond.

The temperature of the spring at its source was 49° Fahr., that of the air being 56° Fahr.

This water was perfectly clear and brilliant, but not sparkling. It had no appreciable taste, but was peculiarly soft and agreeable. It did not contain carbonic acid in a free state, for when mixed with a

solution of chloride of calcium and of ammonia not the slightest turbidity was produced. When boiled it did not lose its transparency, nor produce any deposit, until concentrated to about one-sixth of its volume, when glittering scales of hydrated silicic acid separated.

An imperial gallon, when evaporated to dryness, left a solid residue, which weighed 5·24 grs.

This residue was perfectly white when dried at 300° Fahr.; when heated to low redness, it charred slightly at the edges. The quantity of organic matter was therefore exceedingly small.

Hardness in reference to distilled water as unity = 2·4.

On analysis, an imperial gallon was found to contain—

|                              |       |
|------------------------------|-------|
| Carbonate of lime . . . . .  | 2·00  |
| Chloride of sodium . . . . . | 1·46  |
| Sulphate of soda . . . . .   | 0·407 |
| Silicic acid . . . . .       | 1·143 |
| Organic matter . . . . .     | 0·23  |
|                              | 5·24  |

Traces of an alkaline nitrate were also detected.

During the short visit I made with you to Farnham, we examined several other springs near to their sources. In their general characters these waters closely resembled the preceding sample, all of them being remarkably soft, clear, transparent, inodorous, and free from any excess of organic matter, or of oxide of iron.

By your desire two samples were subsequently sent to me; one marked 'Barford,' the other 'Boorley.'

The water marked Barford contained 6·30 grs. of solid matter in the imperial gallon; when evaporated, scales of silicic acid separated from it in the same manner as from the water taken at Haslemere. Neither of these waters contained any trace of carbonic acid. Their relative hardness (distilled being unity) was—Barford 2·4, Boorley 1·5.

D. The fourth sample of water was drawn from the pump near the church in Bishopsgate-street.

This water was selected as exemplifying the general composition of the shallow well-water of the City of London, when the well is situated near to a burial-ground, as is frequently the case with the parochial wells.

The water from this well is perfectly bright, clear, and even brilliant; it has an agreeable soft taste, and is much esteemed by the

inhabitants of the parish, although, as will be seen by the subjoined analysis, it is an exceedingly hard water, and the large quantity of earthy salts it contains renders it unfit for all culinary and for most domestic purposes.

When heated to the boiling point, this water becomes turbid, and by continued boiling of an imperial gallon of the water for two hours, 23·03 grs. of solid matter were deposited, consisting of 22·15 grs. carbonate of lime, and 0·88 carbonate of magnesia, with a trace of phosphate of lime.

An imperial gallon of this water, when evaporated to dryness and the residue dried at a temperature of about 300° Fahr., left a residue which amounted to 88·07 grs. From another sample of the same water taken a month afterwards, 84·53 grs. of solid residue were obtained.

By an analysis, an imperial gallon of the water gave—

|                                 |        |
|---------------------------------|--------|
| Carbonate of lime . . . . .     | 28·97  |
| Carbonate of magnesia . . . . . | 2·61   |
| Sulphate of lime . . . . .      | 17·85  |
| Chloride of sodium . . . . .    | 16·95  |
| Nitrate of potass . . . . .     | 12·40  |
| Nitrate of soda . . . . .       | 1·50   |
| Nitrate of magnesia . . . . .   | 4·92   |
| Nitrate of ammonia . . . . .    | 4·01   |
| Silica . . . . .                | 0·80   |
| Phosphate of lime . . . . .     | traces |
| Organic matter . . . . .        | —      |

90·01

The residue left by evaporation was of a light brown colour; when calcined at a low red heat it became slightly charred; but I could not, with any degree of certainty, determine the precise quantity of organic matter it contained: it was certainly very small.

The excess of solid matter, as shown by the analysis, over the quantity obtained by evaporating the water to dryness, is owing to the decomposition of the nitrate of ammonia.

The quantity of alkaline and earthy nitrates in this water is very remarkable. These salts are doubtless derived from the decomposition of animal matter in the adjacent churchyard. Their presence, conjoined with the inconsiderable quantity of organic matter which the water contains, illustrates in a very forcible manner the power the earth possesses of depriving the water that percolates it of any

animal matter it may hold in solution; and moreover shows in how complete and rapid a manner this process is effected.

In this case the distance of the well from the churchyard is little more than the breadth of the footpath, and yet this short extent of intervening ground has, by virtue of the oxidizing power of the earth, been sufficient wholly to decompose and render inoffensive the liquid animal matter that has oozed from the putrefying corpses in the churchyard.

The result of these analyses confirms the general statement that the water derived from the sandy districts of Farnham and Bagshot is of eminent purity, and therefore peculiarly fitted for all those purposes of domestic and manufacturing economy which require the use of a very soft water.

When regarded in conjunction with the analyses made by other chemists, of the water taken from the streams, pools, and other collections of water in the same locality, it also points out that, if it be desirable to secure the water in its utmost state of purity, it should be collected at its very source, before it has had time to become impregnated with the various mineral and saline ingredients of the different soils through which it would have to pass. The total absence of free carbonic acid in these waters is a very remarkable fact, and one which I believe has not been hitherto noticed.

It will also be perceived that the principal solid constituent of the water supplied by the New River and the East London companies is carbonate of lime, held in solution by an excess of carbonic acid, an opinion already expressed by several chemists. These waters also contain an appreciable quantity of oxide of iron.

When the water from these sources is boiled, or simply brought to the boiling temperature, the excess of carbonic acid is driven off, and the carbonate of lime being thus deprived of its solvent, the greater portion of it, together with the oxide of iron, is thrown down in the form of an insoluble crystalline powder, while the water is rendered comparatively soft and pure.

Were it therefore possible that means could be devised by which the quantity of water necessary for the daily supply of London could be deprived of its excess of earthy carbonates in a manner sufficiently economic, comprehensive, and effectual, the citizens of the metropolis would enjoy the advantage of a tolerably pure soft water, free from those inconveniences which attend the use of the present hard-water supply.



Confining myself wholly to a chemical view of the subject, the principal disadvantages attending the use of hard river waters are—

First, The precipitation of earthy matter on the inside of vessels in which the water is heated. This furring of the vessel, as it is called, leads to its more rapid destruction, and has also the inconvenience of rendering it more difficult to cleanse, so that the flavour and odour of the various substances cooked in it are not readily removed. From the non-conducting power of the earthy crust, an increased consumption of fuel is also required for the due heating of the vessel.

Secondly, The admixture of the earthy salts with the various articles of food submitted to the action of hot water.

Thirdly, Diminished solvent power, as required for the purposes of the chemist, the brewer, and for many domestic purposes, as in the making of tea, soups, &c.

Fourthly, Diminished cleansing power, both as regards the direct solvent action of the water, and also as causing the decomposition of soap, and consequent increased consumption of that article. I must, however, remark that the annual loss reported to arise from this cause appears to me considerably overrated, since water is rarely used for the washing of linen until previously boiled, and the common practice of adding carbonate of soda to the water completely destroys the ill effects resulting from the hardness of the water. The additional expense of the carbonate of soda, thus added, is too trifling to merit notice; but when this salt is used in excess, as is generally the case, it produces the more serious evil of materially impairing the strength of the fabric submitted to its action.

The only real advantage which hard water possesses over soft (and in the present state of things one of considerable importance), is, that it does not act upon or erode the lead of the pipes and cisterns in which it is contained.

There are also some particular cases of minor importance in which hard water is preferred; thus dyers prefer hard water for rinsing of their goods, soft water extracting too much of the colour; but these cases are comparatively rare, and might be easily accomplished by an artificial hardening of the water.

The following Table indicates the relative hardness of the different waters as determined by the Soap test; distilled water being taken as unity, as proposed by Professor Brande. It also shows the effect of boiling in reducing the hardness of the water. The num-

bers express the direct quantity of an alcoholic solution of soap, which an equal bulk of each water requires in order to form a lather remaining permanent for from five to ten minutes.

|   |      |
|---|------|
| Distilled water . . . . .                   | 1·0  |
| Water from Haslemere . . . . .              | 2·4  |
| Boorley . . . . .                           | 1·5  |
| Barford . . . . .                           | 2·4  |
| Water of the New River Company . . .        | 13·3 |
| Ditto after being boiled                    | 4·7  |
| Water of the East London Company . . .      | 19·0 |
| Ditto after being boiled                    | 5·6  |
| Water from the well in Bishopsgate-street . | 47·4 |
| Ditto after being boiled                    | 26·6 |

The experiments which I have recently made on the action of pure water upon lead, clearly point out the necessity of keeping the pipes always full, especially in those instances in which the water has a tendency, however slight, to erode the lead. As the importance of this part of the question does not appear to have been sufficiently appreciated by the advocates of a constant instead of an intermittent supply, I will briefly recount the facts of the case, although I do not offer them as presenting anything particularly novel. If a piece of bright lead be placed in a stoppered bottle, completely filled with recently distilled water, so that the access of air be wholly excluded, the lead is but very slightly acted upon, and it is only after the lapse of three or four days that its surface becomes spangled with a few minute crystals of carbonate of lead.

If the stopper of the bottle be now removed, the lead still remaining beneath the surface of the water, the erosive action of the water on the lead proceeds more rapidly, but still slowly. But if now a portion of the water be poured off, so as to leave the lead only partially immersed, rapid action on the lead immediately commences. In the course of thirty-six or forty-eight hours, its surface becomes coated with crystalline scales of carbonate of lead, which, falling off, are succeeded by others, so that after the lapse of a few days an abundant deposit of carbonate and hydrated oxide of lead is found at the bottom of the vessel. If the experiment be made with distilled water that has been previously agitated with air, so as to completely aërate it, the lead is more rapidly acted upon, even in a closed vessel, thus clearly showing how much the action of the water upon the lead depends upon the presence or absence of atmospheric air.

Now, in a minor degree, this is precisely what takes place in a leaden pipe conveying water capable of eroding lead. While the pipe is full, comparatively but little action occurs; but when the pipe is filled alternately with air and with water, it is placed under the most favourable circumstances to ensure a rapid erosion of its substance, and consequent contamination of the water.

The rush of water necessarily produced by an intermittent flow must also detach portions of carbonate of lead from the sides of the pipe, even in those cases where the water has no very decided action on lead, and it is therefore far from improbable that in this manner the poison of lead is occasionally conveyed into our kitchens, and becomes mixed with our food.

According to your desire, I have examined the action of the waters from the above-mentioned sources on clean lead, and have arrived at the following conclusions:—the water from Haslemere has a slow though decided action upon the metal, no effect taking place until the lead had been partially immersed for four or five days. After that time, a small deposit of carbonate of lead was perceptible at the bottom of the vessel, although none could be detected in solution. The absence of carbonic acid in the water from Haslemere, Boorley, and Barford, would in all probability prevent their acting upon lead, were atmospheric air at the same time excluded. A piece of lead that had been kept for a week in a closed bottle filled with water from Haslemere did not exhibit the least trace of carbonate of lead, nor could the presence of lead be detected in the water.

It is scarcely necessary to add, that the water as drawn from the pipes of the New River and East London Companies does not exhibit the least solvent action upon lead; when, however, purified by boiling, and placed in contact with lead, crystals of carbonate of lead were observable after the lapse of three days in the water of the New River Company, while, owing to its greater hardness, the water of the East London Company did not exhibit any traces of carbonate of lead until the expiration of more than a week, and even then only in a slight degree. The same waters purified by the patented process of Clark did not exhibit so decided an action upon lead as when purified by boiling; but after evaporating to dryness the water in which lead had been immersed for three weeks, and dissolving the residue in dilute nitric acid, the presence of a minute quantity of lead was rendered evident.

It therefore appears that if leaden pipes, and especially if leaden

cisterns, are to be employed in the distribution and storage of water, on the system of interrupted supply, it will be a necessary safeguard, that the water thus conveyed and stored should not be of less hardness than from six to seven degrees, compared with distilled water as unity; and conversely, it also follows, that if the inhabitants of the metropolis are to gain the advantage of using a still purer and softer water, it will be requisite to do away with the existing leaden pipes and cisterns, and to substitute for them some material which shall not communicate any poisonous or noxious ingredient to the water. As matters now stand, we escape daily poisoning by the use of water loaded with earthy salts, and are thus compelled to drink an impure water on account of the impurity of our vessels. Would it not be better, and is it impossible, to drink the pure element from a pure cup?

I remain, dear sir, with much respect,  
Yours obediently,

THOMAS TAYLOR.

To JOHN SIMON, Esq., F.R.S.,  
Officer of Health to the City of London.

## THIRD ANNUAL REPORT.

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November 25th, 1851.

GENTLEMEN,

I HAVE the honour of laying before you, in the various subjoined tables, such information as will enable you to measure the present sanitary condition of the City of London.

1. The first table (Appendix, No. I.) contains a statement of the present population of the City, as derived from the Registrar-General's recent census; and it compares the existing numbers in each division of the City with those given at the last enumeration in 1841.

In examining this table you will observe that, during these ten years, the general population of the City has increased about  $3\frac{2}{3}$  *per cent.*; that this increase has not been uniform through the nine sub-districts of your jurisdiction; that in some it has been unimportant; that in others there has been an actual decrease, extending even to  $4\frac{2}{3}$  *per cent.* on the previous population; while in the whole East London Union the numbers have risen considerably above the aggregate rate of increase, and in the St. Botolph sub-district exceed those of the former census by more than 16 *per cent.*

Passing over the minor differences which have taken place in the distribution of the population, I cannot regard

that larger increase without apprehension and regret. Probably for the most part it represents the continued influx of a poor population into localities undesirable for residence, and implies that habitations—previously unwholesome by their over-crowdedness—are now still more densely thronged by a squalid and sickly population.

I congratulate your Hon. Court on the recent acquisition of powers (to the nature of which I shall presently advert) for the reduction and prevention of this serious evil.

2. The second table\* presents a summary of the City mortality for the year which terminated at Michaelmas last; showing the deaths, as they have occurred, male and female, during each quarter of the year, in the several districts and sub-districts of the City; and including at the foot of each column, a statement of the year's death-rate *per* thousand of the living in each such district and sub-district.

You will observe that, during the 52 weeks, dated from September 29th, 1850, to September 27th, 1851, there have died of the population under your charge 2978 persons; giving, for the City aggregately, a rate of nearly 23 deaths for every thousand living persons.

The rate of last year was little over 21 *per* thousand.

In my last Annual Report I suggested that the death-rate then prevailing was probably (from temporary circumstances) more favourable than the true average of the City; that it corresponded to the period of recovery from severe

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\* *Appendix*, No. V. The calculated death-rates are omitted from this, as from the other annual tables:—the quinquennial rates (App. No. II.) giving more useful results.—J. S., 1854,

epidemic influences; that it seemed exceptional; and that you might be prepared for this year's mortality showing again a tendency to increase.

Such has been the case; and it illustrates the necessity of appealing to cyclical averages for correct intelligence as to the healthiness of a population. To my mind the increased mortality of this year does not indicate any deterioration of the City in respect of sanitary matters under your control; it shows merely that the death-rate, which must be considered our present average for the City, is in truth higher than that which favourable circumstances, foreign to your jurisdiction, last year permitted us to attain.

Looking to the total mortality of the last three years (the period for which I have had the honour of serving your Commission), I find that 9493 deaths have taken place; which, the mean population of the time being 129,922, gives an average rate of 24·35 deaths *per thousand per annum*. This accords very nearly with a death-rate (24·36) deduced from the septennial period 1838-44, during which (according to the Registrar-General) 22,127 deaths occurred in a population estimated at 129,739.\*

Assuming our City mortality to be accurately represented by these averages, I need not inform your Hon. Court that such a death-rate is unduly high. I have already, in previous Reports, laid before you the materials for measuring its excess,—materials which seem to show that our existing

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\* Since 1841, when the Census gave these figures, the limits of the West London Union have been slightly altered. The Inner Temple and Barnard's Inn have been added to it, while part of St. Sepulchre's parish has been taken away.

death-rate is nearly the double of that which better circumstances have elsewhere rendered attainable.\*

It is not to the City alone of metropolitan districts that this high mortality belongs. Unhappily it affects the entire Metropolis; and we may find other towns in England, and still more on the Continent, where the death-rate is higher than under your jurisdiction. Yet your Hon. Court will not doubt that the standard to be adopted for your estimate of healthiness ought to be the lowest known death-rate; that every avoidable death represents an evil to society; and that, if a mortality of 12, or 13, or 14 *per* thousand *per annum* can be reached for one mixed population, there is ample room for discontent among any other population, which finds itself doomed to perish at double the rate of the first.

3. In the third table† all the deaths of the last three years are enumerated in a form which may enable you to compare one year with another, and one sub-district with another, in respect of their several contributions to the total mortality.

4. In the fourth table‡ are classified, according to the

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\* The death-rate to which I particularly refer in the text, and which I cited in my last year's report, is that of a large district in Northumberland, numbering 27,628 inhabitants, where, during the seven years 1838-44, the mortality was at the rate of only 14 *per* thousand *per annum*; and even in this comparatively low proportion a very distinct share might still be called preventable deaths.

† This information is now included in the Quinquennial Synopsis, Appendix, No. II.

‡ Now embodied in Table VIII.



ages at which they occurred, 9476\* deaths of the last three years. This table is arranged in a manner to display its results—(1) for each year separately, and (2) for each Union separately, in order that you may observe what local or annual differences have obtained as to the ages of chief mortality. You will notice that in 3469 instances, nearly three-eighths of the whole, death has befallen children under five years old. Children at this age constitute about a tenth part of the population of the City. They accordingly die at about four times the rate which would fall to them as equal participators in the average mortality of the district. The next table will throw some light on this disproportionate excess of infant deaths.

5. In it† an enumeration is made of such deaths, during the last three years, as have arisen in consequence of acute disease partially or entirely preventable. They amount to 3923—more than two-fifths of the entire mortality of the period.

I would especially beg the attention of your Hon. Court to the particulars set forth in the successive columns of this table.

The first column shows 391 deaths by fever; and of these, without hesitation, I would speak as entirely preventable. Under favourable sanitary conditions fever is unknown. The deaths arising from it befall for the most part persons in the prime of life, whose premature removal, in the midst of their vigour and usefulness, is not only a

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\* In the remaining number (17) the particulars of age and residence could not be correctly ascertained.

† *Appendix*, No. IX. includes this Table.

direct weakening of society, but is also, in respect of orphanage and widowhood, a frequent source to the public of indirect detriment and expense.

In the second column, swelled by the epidemic visitation of 1849, you will find 902 deaths referred to Asiatic Cholera, and to other kindred diseases. Comparatively few cases of the kind have occurred since Michaelmas, 1849; an overwhelming majority belonged to the summer quarter then terminating, when the Metropolis generally was suffering from the presence of Cholera. I have already had occasion to show you that this frightful pestilence belongs only to localities which, by their general epidemic mortality, have previously been stigmatised as unhealthy; that, over districts otherwise healthy, it migrates without striking a blow; that it may, therefore, with confidence be spoken of as a disease proportionate to removable causes—in other words, as a preventable disease.

I cannot pass over these two columns, without begging you to observe what perhaps may be novel to you. If, instead of reckoning the cholera-deaths as belonging solely to the one year in which they happened, you reckon them as belonging to the whole term of years which elapsed between the two visitations of the epidemic, and distribute them equally over that period, so as to form an average—say for fifteen years, you cannot fail to notice how largely, in the long run, the destruction by fever (which is always here) surpasses the fatality of that Eastern disease; so much so, that the average annual mortality by the latter probably does not amount to half the fatality of the former.

Nor must it be lost sight of, that if the *deaths* by typhus double in number those produced by cholera, the list of *persons attacked* by the former disease; and thereby for a

long while incapacitated and suffering, is immeasurably beyond this proportion. Two or three times the number of deaths by cholera would give you the number of seizures, and enable you to estimate all the direct mischief caused by it; while, in regard of typhus, probably for one death there are twenty cases of protracted illness, tardy convalescence, and injured constitution. Not only are the deaths double in number, but each of them indicates an infinitely larger amount of sickness and suffering not immediately productive of death.

The frightful suddenness of the rarer disease, and the condensation of its epidemic fatality into some single year, give it more apparent importance than belongs to the familiar name of typhus; but I can assure your Hon. Court, that if a large amount of preventable death, and a still larger amount of preventable misery, be strong arguments for sanitary improvement and activity, those arguments are more abundantly derivable from the constant pressure of fever and its kindred maladies, than from the sharper but infrequent visitations of the foreign pestilence.

In the third column of this table come deaths by scarlatina. Of these, perhaps a certain proportion would occur even under favourable circumstances; for, whatever may have been the original derivation of the disease, it is impossible to doubt that the severity of its attack mainly depends on conditions peculiar to the person of the patient, and that no perfection of external circumstances will ensure mildness of infection. But on the other hand it is certain, that, under attacks of the disease at first equally malignant, adequate ventilation with pure air will enable one patient to wrestle successfully against the poison, while another, less favourably circumstanced, will rapidly sink beneath its in-

fluence; and hence I have no hesitation in assuring you, in respect of the 213 deaths registered under this head, that a majority would have been avoided under improved domestic arrangements.

In the fourth column, you will read of 91 deaths by small pox. Your judgment will not be a harsh one, if you assume that 90 of these were the result of criminal negligence. Under the present administration of the Poor Laws, vaccination is not only accessible to all members of the community, but is literally pressed on the acceptance of the poor. Those stupid prejudices, which for some years retarded the universal adoption of Jenner's great discovery, have now died away; the neglect of vaccination must be regarded as the omission of a recognised and imperative duty. Deaths of children, arising in this parental neglect, ought to be considered in the same light as if they arose in the neglect to feed or to clothe; and I am disposed to believe, that the readiest way of bringing this view of the case before those uneducated classes, where the omission usually arises, would be to procure Coroner's inquests every year in respect of some half dozen or more instances where the evidence of neglect might happen to be glaring.

In the fifth column of the table stand recorded a hundred deaths by the poison of erysipelas, in one form or another; arising sometimes spontaneously, sometimes in connection with the child-bearing state, sometimes in sequel of accidental lesions and surgical operations.

My daily experience as a Surgeon—especially as a Hospital-Surgeon, enables me confidently to speak of these diseases as an artificial product of unhealthy exterior conditions. The contrasting results of surgical operations in town and in country—of operations undertaken amid pur-

ventilation, in spacious cleanly rooms and dry localities, with those undertaken under opposite circumstances (in the dwellings of the poor for instance, or wherever else amid damp, dirt, and over-crowding), and the similar experience which exists as to the origination of puerperal fever, would be quite conclusive as to the fact, that of the 101 deaths under this head, a large majority might have been prevented.

Next, in the sixth, seventh and eighth columns, stand deaths arising in the chief acute diseases of infancy, those to which the disproportionate mortality of infants is mainly due. Many careful statistical observations, as well as personal experience, convince me that the immense fatality recorded under this head, is, to a very great extent, due to obviable causes.

To bring this matter distinctly before you, I must take, as a standard of comparison, some district where the general death-rate is sufficiently low to distinguish it as eminently healthy; and in such an one you will notice a marked diminution, not only (of course) in the *number* of infant deaths, but likewise in their *proportion* to the total mortality.

Such a district is that of the combined parishes of Glendale, Bellingham and Haltwhistle, in the county of Northumberland. In it the general death-rate is 14; in the East and West London Unions of the City of London, the general death-rate is 26·73. In the former district, children under five constituting more than an eighth of the population ( $\frac{1}{7\frac{1}{2}}$ ), their deaths form about a quarter of the whole mortality; while in the latter district, where the children are in smaller proportion—namely about  $\frac{1}{9}$  of the population, their deaths are not much less than half ( $\frac{1}{2\frac{1}{2}}$ )

of the whole mortality. Thus, in the healthier district they die at less than double the average rate for all ages; in the unhealthier, at more than four times that average.

A still better method of district-comparison, is to arrange in a series the death-rates prevailing in several localities for persons *over five years of age*, and side by side with this column, another for the death-rates of children *under five years of age*. The first column will of course indicate very well the relative sanitary conditions of the districts; but the differences between them will be expressed far more clearly, and, as it were, in a magnified form, in the column of infantine death-rates. Thus, for instance—to repeat the comparison just instituted between the Northumberland and the London district; the death-rate for all ages over five is about 12 in the former district, and nearly 15 in the latter; a difference quite sufficient to establish the inequality of their sanitary conditions. But, how much more strongly is this disparity expressed in the comparison of the infantine death-rates—26·5 for the healthier district, 107·57 for the unhealthier one!

Nothing can be more conclusive than the evidence afforded by statistics, as to the dependence of high infantine mortality on the general causes of endemic unhealthiness. My own observation within the City gives complete confirmation to this view, showing me that the diseases specified in my table (diarrhœa, bronchitis and pneumonia, hooping-cough, croup and measles, hydrocephalus and convulsions) however various in nature they may seem, and however apt you may be to dissociate their occurrence from the thought of local causation, yet unquestionably multiply their victims, in proportion to the otherwise demonstrable unhealthiness

of a place, owe most of their fatality to local causes, and may, therefore, to a great extent be disarmed of their malignity.

The last column gives the total of those which have preceded it, and shows, out of 9493 deaths, 3923, all from acute disease, in intimate dependence on local and obviabile causes. It will be a moderate computation with respect to these deaths, if we estimate that two-thirds of them might have been hindered.

And yet it is not only by *acute* disorders, that preventable death succeeds in ravaging the population. If we turn to the examination of *chronic* ailments producing death, we may quickly recognise many indications of their preventability, and may satisfy ourselves that here also the general mortality might be very largely reduced.

Look, for instance, at the whole immense class of scrofulous diseases, including pulmonary consumption, a class probably causing, directly or indirectly, at least a quarter of our entire mortality; and consider the vast influence which circumstances exert over its development.

Of such circumstances some lie within your control, and affect masses of the people; but the more special causes of chronic disease lie rather out of your jurisdiction, and the option of avoiding them is a matter of individual will. Vicious habits and indiscretion; a life too indolent, or too laborious; poverty and privation; vicissitudes of weather and temperature; intemperance in diet; unwholesome and adulterated food; and, not least, inappropriate marriages tending to perpetuate particular kinds of disease; these words may suggest to you, briefly, that there are many influences, within the sphere of private life, by which the

aggregate death-rate of a population is largely enhanced, but the control of which, if attainable, lies almost entirely at the discretion of the classes subject to their operation.

Considering all these causes, and the needless waste of life occasioned by them, I can have little doubt that as much might be done by individuals, under the influence of improved education, to lessen the mortality from chronic disease, as by sanitary legislation to stay the sources of epidemic death. And regarding both classes of disease together—those, on the one hand, which are of endemic origin (arising in imperfect drainage, in defective water-supply, in ill-devised arrangement of buildings, in offensive and injurious trades, in the putrefaction of burial-grounds, and the like) and those classes, on the other, which arise in the circumstances of individual life, I can have no hesitation in estimating their joint operation at a moiety of our total death-rate, or in renewing an assertion of my last years' Report, 'if the deliberate promises of Science be not an empty delusion, it is practicable to reduce human mortality within your jurisdiction to the half of its present average prevalence.'

To revert, however, to your more special branch of the subject,—I have thought the present a convenient time for indicating to you the pressure of preventable death, arising in acute disease, because of the great addition which you have recently gained to your powers for enforcing prevention.

That an average death-rate of nearly 25 *per* thousand *per annum* prevails in the City; that three-eighths of your mortality consists in a premature extinction of infant life; that fatal disease, in more than two-fifths of its visitations,



is of a kind which operates endemically and preventably;— these are the facts to which I have appealed, as my evidence of the need for sanitary activity and perseverance.

On other occasions I have endeavoured to set before you what are those agencies hostile to life, which affect the masses of an urban population; and during the last three years your Hon. Court has shown its recognition of these causes, and has devoted attention to the means of counter-acting them by appropriate sanitary measures.

In too many instances, the powers first given you by the Legislature were inadequate to this great purpose. But now, armed with the further authority of your new Act of Parliament, you enjoy such means for sanitary improvement as have never yet been possessed by any Corporation in the country; such means as, judiciously wielded, cannot but produce the greatest advantage to persons living under your jurisdiction.

As you are only now entering on the exercise of these powers, it may be convenient that I should submit to you a brief account of them, and I gladly turn from contemplating the spectacle of preventable death, to analyse the means of prevention now vested in you by the Legislature.

1. In regard of *public drainage or sewerage*, the first and most elementary condition of endemic health, I need hardly tell you that within the City, your powers are absolute. You have entire and sole responsibility for the construction and maintenance of sewers, for their cleaning or flushing, and for the prevention of noxious effluvia from their innumerable gully-holes.

2. In the all-important particular of *house-drainage*, your

authority is sufficient for every purpose. You can order the complete abolition of cesspools; the construction of drainage in any premises within fifty feet of a sewer; its repair, cleansing, or renewal, whenever it may be disordered: and not only can you order these works to be done, but—failing the owner's compliance with your notice, you can devolve the performance of his duty on your own workmen, and can recover your expenses from the recusant.

3. In regard of *water-supply to houses* your powers are equally cogent, though the unsatisfactory condition of the water-trade continues a serious obstacle to their effective employment. You have authority here, as with house-drainage, to order the construction of all necessary apparatus, and to enforce the fulfilment of your order.

Under both these heads, you possess a power hitherto but imperfectly used, the complete and constant exercise of which I would strongly recommend to your Hon. Court. In all those clauses of your Acts of Parliament, which relate to private works of house-drainage and water-supply, there occurs a very important phrase:—such works shall be constructed 'to the satisfaction of the Commissioners.' Now, of private works effected under the authority of your Act, during the last three years, a certain, not inconsiderable, share proves inoperative and bad. The mere overflowing of a water-butt (and in numberless instances this is the arrangement evasively adopted under your orders) can never suffice for the effectual cleansing of house-drains. I need scarcely inform you that an obstructed drain and choked privy, wherever they occur, are equivalent to a cesspool;

shedding abroad the same effluvia, and producing the same deadly results. No gain is gotten to the wholesomeness of a house, by substituting for its former cesspool an equally offensive and inoperative drain. To my knowledge, much of the drainage done during the last three years is liable to this risk; and it appears to me indispensable that you should exert direct supervision against so serious an evil.

I would recommend to your Hon. Court that, in issuing orders for the construction of drainage and water-supply, you should require a full specification to be delivered you of the works about to be undertaken, and should distinctly decide as to their sufficiency; or by a still simpler process, that you should fix and determine a certain standard of combined works; a model plan, in short, for house-drainage, privies, and water-supply, and should direct your Inspectors to certify to you the sufficiency of only such works as may accurately correspond to this design.

I cannot but regard it as a grave calamity, that the general supply of water to the City remains beyond your control, in the hands of irresponsible traders; for its imperfect adaptation to the requirements of the public constitutes the largest sanitary evil of the day.

4. You have entire control over the *pavement of every public way* within the City, for its construction, maintenance, and cleansing; and in this respect you exercise a power of great sanitary value. The preservation of cleanliness along the whole extended surface of the City, including its many hundred courts and alleys, is indeed a branch of your functions which can hardly be over-estimated for its importance; and the fines which you have the power of

levying from your contractors, whenever the scavenging is neglected, are useful securities for the general performance of their duties.

It lies within your power to order, wherever you may think fit, the employment of the hose and jet for the purpose of surface-cleansing in courts and alleys: and, I may add, that the advantages of this most effective sanitary process have been highly appreciated where you have directed its application.

In some of the poorer localities, complaints have arisen in a matter relating to the pavements, where you are not able to afford the complainants effectual relief: viz., with respect to certain inhabitants throwing refuse and offensive matters from the houses into the public way, so that nuisance is created. I have already suggested to your Hon. Court, and I beg leave here to repeat, that in the 41st clause of the City Police Act, provision is made for the prevention of this particular offence, and that your four Inspectors are manifestly unable to relieve the Police Force of their legal responsibility in the matter.

5. Your powers for enforcing the wholesome *cleanliness of private premises* are equally considerable. You can order the removal of offensive matter, the purification and white-washing of premises, and the abatement of any nuisance arising in conditions of filth. In case of need, as shown by a medical certificate, you can summon the offender before your Court; and (under your new Act) you can punish with a heavy fine any repetition of the nuisance against which your order has once been issued.

6. So long as *slaughter-houses* are tolerated within the

City (and it is to be hoped this may not be long) you have power to regulate their use, according to your discretion, with a view to their cleanliness and better management; and in case of disobedience to your orders, you have power to enforce the temporary suspension of slaughtering. Your new Act renders illegal any slaughtering in cellars, or any keeping of cattle there: and it prohibits that offensive exposure of putrescent hides, which has so often been complained of in the vicinity of Leadenhall Market.

7. In close connection with the regulation of slaughter-houses, your new Act gives you authority in a matter hitherto quite foreign to your jurisdiction, but where your vigilance may no doubt be exercised with great advantage to the public health. You are authorised to *appoint Inspectors of slaughter-houses and of meat*; and these officers are required to inspect shops, markets, and slaughter-houses, and to seize and destroy any meat which may appear to them unsound or unwholesome. A further clause of very extensive application enables you to deal generally with all cases, where *unwholesome provisions* are exposed for sale; and this clause is so constructed as to include and render penal all those *fraudulent adulterations of food* which render it detrimental to health.

8. You are invested with important authority against *such trades and occupations as are offensive or injurious* to their neighbourhood. Under your former Act, you can subject to penalties any person who shall 'roast or burn, boil, distil, or otherwise decompose any root, drug, or other article or thing, in any house or building, and thereby cause

offensive or injurious smells or vapours to be emitted therefrom, so as to become a common nuisance;’ and the same Act also gave you a very inoperative clause against such nuisance-causing manufactories as might begin to work in the City after the commencement of that Act.

Your new law enacts that everything practicable shall be done for the suppression of all nuisances arising in manufactures and the like:—that, after the first of January next, every furnace used in the City shall be such as to consume its own smoke; and that whatever trade or business may occasion noxious or offensive effluvia, or otherwise annoy the inhabitants of its neighbourhood, shall be required to employ, to your satisfaction, the best known means for preventing or counteracting such annoyance.

9. You have certain powers, to which I adverted in my former Report, as likely to come into activity whenever the injurious practice of intramural burial might cease; powers, namely, relating to the *disposal of dead bodies* in certain specified cases: and under your new Act, you have acquired some further authority (likewise only to be exercised after that cessation, and with the consent of the Bishop of London) to *appropriate the disused burial-grounds* for purposes of improvement. At the time of my last Report I looked ‘forward to the complete discontinuance of burial within your territory as a matter for warm congratulation among all who are interested in the cause of sanitary improvement;’ and it is with proportionate disappointment and regret, that I have now to report to you that the Order in Council, which was to have closed all metropolitan burial grounds, has never yet been issued; and that negotiations,

conducted by the General Board of Health for the purchase of a sufficient extramural cemetery, were suddenly arrested at the close of the last session of Parliament. Your powers in relation to these matters remain of course meanwhile inoperative.\*

10. The most important additions made to your power relate to *the dwellings of the poor*, and are embodied chiefly in the tenth section of your new Act. The definition of 'lodging-house' given in this clause is so extensive, and the power of regulation conceded to you is so unconditional (where once the necessity for your interference is shown) that your Hon. Court can now exert your authority for every legitimate object, in respect of all the poorer houses in the City.† The definition is, that 'the expression *common lodging-house* shall, for the purposes of this Act, mean any house, not being a licensed victualling house, let, or any part of which is let, at a daily or weekly rent not exceeding the rate of three shillings and sixpence per week; or in which persons are harboured or lodged for hire for a single night, or for less than a week at one time; or in which any room let for hire is occupied by more than one

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\* In the Parliamentary Session of 1852, the Interments Act of 1850, which had remained inoperative, was repealed under a new 'Act to amend the Laws concerning the Burial of the Dead in the Metropolis,' which became law July 1st, 1852. Under this Act, the powers, alluded to in a later part of this volume, were given to the Commissioners of Sewers of the City of London as a Burial Board for the City.—J. S., 1854.

† Circumstances, which need not here be detailed, have led to disappointment in the working of this clause, and have shown, to my great regret, that I over-estimated the benefits it was capable of conferring.—J. S., 1854.

family at one time.’ And your powers are to the following effect:—Wherever over-crowding has taken place unwholesomely or indecently—wherever undue illness has prevailed—wherever from any one of several causes the house is unfit for occupation, you can require its *immediate registration*; you can then *make such rules* as you think fit for the *maintenance of decency and health*; and you can enforce conformity to those regulations with appropriate penalties.

The terms of the clause throw on your Medical Officer the responsibility of initiating these proceedings; and his task in the matter will be one of anxiety and arduousness. In most other clauses of your Acts of Parliament, an alternative is allowed as to your taking the opinion ‘of the Officer of Health, or of any two duly qualified Medical Practitioners:’ but in this clause you are expressly restricted to the certificate of your Officer of Health.

In my two former Reports, I have addressed you at length on those conditions relative to the dwellings and social habits of the poor which made the enactments of this clause indispensable; and I look forward to its operation with a sanguine belief that it may be rendered one of the most important boons ever conferred on the labouring classes of the community.

I subjoin to my Report the schedule which I would suggest for the registration of lodging-houses, and which (as you will observe) requires detailed information as to every sanitary particular of the dwelling.\* I would recommend that in every case, where registration is made, the owner’s specification of these particulars should be accompanied by a written certificate from your Inspector; testi-

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\* Vide page 210.



fyng (in some such form as that annexed to the schedule in my Appendix) first, to the accuracy of the statement, and; secondly, to the general condition of the house.

With respect to the rules, which, under authority of this clause, you may find it requisite to lay down for better regulating the residences of the poor,—the conditions for which you have to legislate are so various and complicated, that no formula will apply universally; and you will often be called on to adapt special rules to particular cases as they come before you. I can therefore only venture at present to offer you general suggestions on the subject.

You will find that the houses in which your interference is required fall into three cases, characterised as follows:—

(1) Where the house is let in several independent holdings (often as many holdings as rooms) each occupied by a single family and no more, and paid for at a rent not exceeding 3s. 6d. *per* week;—(2) Where the house is thus let in several independent holdings, and where the renter of each or any portion, admits other persons to share his holding with him, on their payment to him of a sub-rent *per* week or *per* night, so that a room comes to be occupied by more than one family at a time;—(3) Where the entire house, or all such part as is let in lodgings is under the direct management of a single resident proprietor or keeper, where the lodgings are let at . . . *per* night, and where many persons not belonging to one single family are lodged together in some single room, or in various single rooms of the house.

Of the first arrangement, where a single room is the residence of a single family, you have innumerable illustrations in the City; as, for instance in the large houses of Windsor-street (to which I have recently drawn your atten-

tion) where in one house there are sixteen such holdings:—of the second arrangement—the most abominable and brutalising which can be conceived, you have sufficient illustrations in Plumtree-court:—of the third—comparatively little known in the City, there are instances in Field-lane.

In respect of the first class of houses, I should be disposed to look upon each holding as the house of its occupier, and not to interfere within his threshold, except on the ground of some commanding necessity. I would require only that the general arrangements of the house should be adapted to the number of its holdings; that, for instance, numerous families should not be left competing for the use of a single privy, but that such accommodation should be provided in strict proportion to the requirements of the inmates; that every room should be efficiently ventilated; that water should be supplied to the highest occupied part of the house, and a water-tap and sink furnished on every floor; that the dust and refuse of the house should be removed at least once daily.

In dealing with the worst specimens of this class, it may be requisite to go further than I have here intimated; and it appears to me that for this purpose your Hon. Court must address your regulations not to the tenant, but to the landlord. He, I apprehend, must be held responsible for the decent and wholesome condition of his property, and for such conduct of his tenants as will maintain that condition.

Seeing the punctuality with which weekly visitation is made for the collection of rents in these wretched dwellings, it would not be unreasonable, I think, to insist on some such regulation as the following:—The owner of the house,

or his agent, or collector, shall visit each room on an appointed day, at least once weekly, between the hours of eleven and three; he shall see that the floor and other woodwork of the room have been properly washed on that day, that the room be free from all dirt, rubbish, or offensive smell, that no objectionable trade be pursued in it, and that it be generally in good and proper repair; he shall see that the premises generally\* be in a clean and wholesome condition, that water be sufficiently supplied, and that the dustman's work be regularly performed; and failing either of the two latter conditions, he shall forthwith lay complaint thereof before your Commission; in case of any inmate suffering from cholera, small-pox, erysipelas, or any kind of fever, the owner, or his agent or collector, shall immediately give notice of such illness to the Inspector of his district; and at the meeting of the Commission next after such notice, he shall, if required, attend your Court, to receive any order which you may issue for reducing the number of his lodgers, or for improving the condition of his house, or for employing any disinfectant process; and he shall fulfil any such order within the time therein specified.

In a proceeding so experimental as the present, I cannot assure you of infallible means for meeting every evil contingency; but it seems to me that a regulation having the general tendency here indicated, enforced by moderate penalties, would work an important revolution in the economy of dwellings affected by its operation, would render it

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\* Namely—passages, staircases, area, cellar, yard, privy, &c., and if common privies and urinals exist, he shall provide for the cleansing of these, where requisite, at least once daily.

indispensable to the landlord of such holdings to promote cleanly and decent habits among his tenants—even to obtain security for their good behaviour, and it would make it difficult or impossible for persons of opposite habits to obtain holdings under a landlord who would be virtually punishable for their misconduct.

Such a regulation would apply, as I have said, to the lowest and filthiest specimens of the first class of lodging-houses; for, to the large majority of that class less stringent rules would suffice; and it would apply most usefully to the second class of lodging-houses—those in which the single rooms of a house are severally occupied by more than one family. So great are the physical and moral evils attending this indiscriminate admixture of adult persons of both sexes (as I have submitted to you in my former reports), that I entertain no doubts of the necessity for prohibiting it in the most absolute manner. A regulation to the following effect would, probably, fulfil the purpose contemplated by the law, and would disperse these loathsome heaps of disease, destitution, and profligacy: viz.—There shall not be lodged in a sleeping-room, at any one time, more than two persons over fourteen years of age, if of different sexes; nor more than\* — such persons, if they be all of one sex.

This order—in addition to its wholesome influence on the second class of lodging-houses, would apply beneficially to the third class; and, in further relation to the latter, there would probably be required various minor regulations with

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\* This number would be proportioned to the cubical contents of the room, and its facilities for ventilation, of which mention would be made in the registration-schedule of the house.

respect to facilities for washing, lighting, ventilation and the like, which admit of being fixed in detail, only as each particular case comes under your notice, with its deficiencies recorded in the schedule of its registration.

11. In addition to this power of regulating lodging-houses, a further authority has been conceded you by the Legislature, for the *amendment or removal of houses presenting aggravated structural faults*. Wherever your Officer of Health may certify to you that any house or building is permanently unwholesome and unfit for human habitation, you are empowered to require of the owner (or, in his neglect, yourselves to undertake) the execution of whatever works may be requisite for rendering the house habitable with security to life.

Finally,—under your former Act you were authorised, and indeed *required, to appoint Inspectors of Nuisances*, whose duties were to consist in the following particulars:—They were to superintend and enforce the due execution of all duties to be performed by the scavengers; to report to your Commission all breaches of your rules and regulations; to point out the existence of nuisances; to record whatever complaints might arise in relation to the supply of water, or in relation to any infraction, either of the Act, or of any of the regulations made by you under its authority for the preservation of order and cleanliness and for the suppression of nuisances.

Hitherto your Hon. Court has deemed it sufficient compliance with the terms of the Act, to engraft the functions above described on the office of your previously appointed

Inspectors of Pavements; and these Officers have endeavoured very diligently to fulfil the multifarious obligations thus imposed on them. During the past year it has become obvious to me that this arrangement of their duties is inconvenient, and that the occupation of their time as Inspectors of Pavements prevents them devoting the requisite number of hours to the other important duties.

I need hardly add, for the information of your Hon. Court, that the immense increase of sanitary business implied in your new Act (an increase probably equivalent to doubling or trebling the former amount) renders a continuance of the former arrangement still less possible than heretofore; the important functions assigned to your Inspectors of Nuisances will now require to be discharged, under the superintendence of your Officer of Health, with uninterrupted assiduity and vigilance; and I would therefore take the liberty of begging your Hon. Court to refer this subject to the consideration of your Committee, together with some other points relative to the administration of your new powers.\*

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Here, gentlemen, terminates my statement of the powers now vested in you for the maintenance of the public health. Authority so complete for this noble purpose has never before been delegated to any municipal body in the country. In exercising the means of such wide beneficence, your

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\* Two additional Inspectors came into work, under appointment of the Commission, at Christmas, 1853. See last Annual Report.—J. S., 1854.

Hon. Court will be discharging duties of immeasurable importance to the public welfare; and those who have the honour and responsibility of giving you professional advice will have a task of more than ordinary difficulty.

It is easy to foresee the numerous obstacles which interested persons will set before you to delay the accomplishment of your great task. Sometimes technical objections will be raised to your proceedings: sometimes vexatious delays and evasions will occur in the fulfilment of your injunctions.

When your orders are addressed to some owner of objectionable property—of some property which is a constant source of nuisance, or disease, or death; when you would force one person to refrain from tainting the general atmosphere with results of an offensive occupation; when you would oblige another to see that his tenantry are better housed than cattle, and that, while he takes rent for lodging, he shall not give fever as the equivalent;—amid these proceedings, you will be reminded of the ‘rights of property,’ and of ‘an Englishman’s inviolable claim to do as he will with his own.’

Permit me, gentlemen, to remind you that your law makes full recognition of these principles, and that the cases in which sophistical appeal will oftenest be made to them, are exactly those which are most completely condemned by a full and fair application of the principles adverted to. With private affairs you interfere, only when they become of public import; with private liberty, only when it becomes a public encroachment. The factory chimney that eclipses the light of heaven with unbroken clouds of smoke, the melting-house that nauseates an entire

parish, the slaughter-house that forms round itself a circle of dangerous disease—these surely are not private, but public affairs. And how much more justly may the neighbour appeal to you against each such nuisance, as an interference with his privacy; against the smoke, the stink, the fever, that bursts through each inlet of his dwelling, intrudes on him at every hour, disturbs the enjoyment and shortens the duration of his life. And for the rights of property—they are not only pecuniary. Life, too, is a great property; and your Act asserts its rights. The landlord of some overthronged lodging-house complains, that to reduce the numbers of his tenantry, to lay on water, to erect privies, or to execute some other indispensable sanitary work, would diminish his rental: in the spirit of your Act, it is held a sufficient reply, that human life is at stake, and that a landlord, in his dealings with the ignorant and indefensive poor, cannot be suffered to estimate them at the value of cattle, to associate them in worse than bestial habits, or let to them for hire, at however moderate a rent, the certain occasions of suffering and death.

And indeed, gentlemen, the mere pecuniary import of life thus squandered is not inconsiderable. The costs of medical attendance on these superfluities of disease are heavy items of parochial expenditure: and although much of the undue mortality is of children, and consists in the premature extinction of life that hitherto has no market value—costing only the tears that are shed for it; yet there likewise occur among your preventable deaths, very many cases in which adult life is sacrificed, with all its strength and utility; and where, besides the wasted capital which that loss implies, there often remains for the district



which has poisoned the man an entailment of orphanage and widowhood.

Nor, again, can it be questioned, that year by year, as general education advances, the sanitary condition of a district will be an important element in determining the value of its property. In engaging houses, men will not only look to rent, and to rates on rent; they will look also to rates on life, and will doubt the cheapness of a town residence, however small in rental, where their lease of life must be shortened from its intended duration, and form part of an average mortality two-thirds higher than in the suburbs. It is an instinct in this direction, or perhaps the guidance of knowledge, that within late years has given so much extension to suburban residence, and has carried numbers of the wealthier inhabitants of the City to dwell so far from their places of daily business: and the same instinct or knowledge yearly acts more towards the less affluent classes, urging them to fly as far as possible beyond the smoke and crowding and unwholesome vapours of the metropolis. I entertain great hope and little doubt, that, within a few years, the working classes will have organised for themselves extensive means of suburban residence; that vast barracks of model-houses, rising on healthier soil and amid purer atmosphere, will receive hundreds of thousands of inmates from those classes of society which now throng the courts and alleys of the metropolis; and that by this spontaneous emigration, in so far as it may affect the City, great assistance will be given to those endeavours which will be made, under authority of your Act, to thin the court population of the City, and to diminish the too dense array of houses inhabited by the poor.

As I look to the poor-rates of the City of London, as well as to the other circumstances just adverted to, I feel the deepest conviction that *property*, no less than *life*, is interested in the progress of sanitary reform: and once again, most earnestly, I beg leave to congratulate your Hon. Court on the acquisition of powers, conferring on you the inestimable privilege of doing so much good for those whom you represent, and for the often unrepresented poor; of relieving so much suffering; of prolonging so much life.

That much improvement remains to be accomplished within your province, is a certainty which I have endeavoured here, as on former occasions, plainly to set before you.

But I cannot close my Report without adverting to the fact, that both within and around the City, there are sanitary evils for which you are not responsible—evils beyond your control—powerful causes of diseases in hourly operation; and that these are so extensive in their agency, as to neutralise much of the good which it lies in your competence to effect.

The mere fact, that for the metropolis generally there is hitherto no sanitary law, such as you possess for your territory, is an evil to you. When, at the commencement of next year, you will be proceeding to suppress the several nuisances against which you are armed; when the various trades of the City will have ceased to send forth smoke or stink, you can raise no barrier against invasions from around; southward, you cannot exclude the unwholesome airs wafted from the river and from across it; nor on either side, east or west, the soot that showers down from innu-

merable shafts encircling you ; nor northward, the odours that rise from the shambles of Clerkenwell.

And likewise within the City there will be remaining—out of your control, unremedied evils, the existence of which has long been denounced, and the removal long expected.

In 1849, with the cholera amidst us, great exertions were made, and greater promises. In that dreadful week, when two thousand victims of our metropolitan population fell beneath its poison; when every household, from hour to hour, trembled at the visible nearness of death; the public were scared out of indifference. If the visitation could have been bought away, at the expense of doubling all local rates in perpetuity, no doubt the sacrifice would have been made. Public opinion was kindled to overwhelm all opposition.

The metropolis was to be drained afresh; the outfall of sewerage was no longer to be beneath our windows; the river was to be embanked; its rising tide was no longer to make our sewers disgorge their poisonous contents into our streets and houses; dead bodies in their decay, were no more to desecrate the breathing-space of the living; water was no longer to be supplied—clumsily, insufficiently, and unwholesomely, at the discretion of private capitalists: all was to be amended.

For participation in these advantages, the City had to look beyond its own representatives, and to await the more comprehensive measures of Her Majesty's Government.

Two years have elapsed, and none of the measures referred to has made visible progress. The water question remains unsettled; arrangements for extramural interment of the dead have been disconcerted at what seemed the

moment of their completion; the river still receives the entire sewage of this immense metropolis, and still at each retreating tide, spreads amid the town, as heretofore, its many miles of fetid, malarious mud.

In justice it should indeed be remembered, that any one of the required amendments could only be the result of long preparatory labour, and that its organisation would often of necessity be the travail of some single mind, not insusceptible of fatigue. Particularly as respects the scheme (now understood to approach its maturity) for the complete drainage of the metropolis, it cannot be overlooked that very extensive surveys, superficial and subterranean, with innumerable drawings and specifications, were necessary to the construction of so comprehensive a plan.

But neither can it be disguised or disregarded, that meanwhile, in the absence of these sanitary works, there are dying needlessly and prematurely thousands of the population; that preventable death, hitherto unprevented, is proceeding at its accustomed pace; that children continue to perish at three or four times their due rate; that time, which carries us from one visitation of the great epidemic and obliterates the remembrance of our alarm, also, too probably, carries us towards the day of another outbreak: that typhus—our home-bred and daily visitant, rehearses the same warnings as heretofore, moving uniformly onward like the shadow on a dial, toward the hour when that Eastern pestilence may again be here.

Therefore, gentlemen, I have felt it my duty to represent to you that, in the promotion of those metropolitan works, the population of the City of London have an incalculable interest;—that the emancipation of human life from such

fetters of disease as weigh on it, can never even approximate to completion within your City, while the saturated burial-grounds still continue to receive their annual multitudes of the dead, while the administration of the water-supply interposes an effectual hindrance to your most important functions, and while the river, contaminated and unembanked, diffuses injurious miasms through the whole extent of your jurisdiction. And I would further venture to urge on the consideration of your Hon. Court, that your legitimate influence with Her Majesty's Government and with Parliament—your influence as trustees of the Public Health for so large a constituency, exerted in furtherance of those metropolitan reforms to which I have adverted—would be tending, not only to the general good, but directly and eminently to the sanitary advantage of the City of London.

I have the honour,

&c., &c.

*Proposed Schedule of specification for the Register of Lodging-houses.*

House situate at No. \_\_\_\_\_

Name and Address of Owner \_\_\_\_\_

Number of Floors (including Cellars and Lofts) \_\_\_\_\_

Rooms \_\_\_\_\_

| No. on door. | Situation. |         | Height. |     | Length. |     | Breadth. |     | Windows. | Flooring. | Fire-place. | Ventilators. | Rent. | Number of Inmates.                 |                       |
|--------------|------------|---------|---------|-----|---------|-----|----------|-----|----------|-----------|-------------|--------------|-------|------------------------------------|-----------------------|
|              | Floor.     | Aspect. | ft.     | in. | ft.     | in. | ft.      | in. |          |           |             |              |       | Weekly, or monthly, or per person. | Under 9 years of age. |
| 1            |            |         |         |     |         |     |          |     |          |           |             |              |       |                                    |                       |
| 2            |            |         |         |     |         |     |          |     |          |           |             |              |       |                                    |                       |
| 3            |            |         |         |     |         |     |          |     |          |           |             |              |       |                                    |                       |
| 4            |            |         |         |     |         |     |          |     |          |           |             |              |       |                                    |                       |
| 5            |            |         |         |     |         |     |          |     |          |           |             |              |       |                                    |                       |
| 6, &c.       |            |         |         |     |         |     |          |     |          |           |             |              |       |                                    |                       |

Account of Rooms separately.

Staircase, if with windows or skylight \_\_\_\_\_

Sinks \_\_\_\_\_

Privies... { Number \_\_\_\_\_

Situation \_\_\_\_\_

Dustbin \_\_\_\_\_

Water-supply... { Receptacles... { Material \_\_\_\_\_

Capacity \_\_\_\_\_

Situation \_\_\_\_\_

Taps, where situated \_\_\_\_\_

Yard—size of uncovered area \_\_\_\_\_

Pavement \_\_\_\_\_

Laundry \_\_\_\_\_

Signature of Owner \_\_\_\_\_

Date \_\_\_\_\_, signed \_\_\_\_\_ Inspector.

NOTE.—I, \_\_\_\_\_, Inspector for the Commissioners of Sewers of the City of London, do certify that the above schedule contains a true account of the matters to which it relates; also that I have examined the privies, drains, sinks, and water-supply in the above house, and do find the same to be in an efficient and satisfactory condition; also that the house generally is in good repair, perfectly clean, and free from disagreeable smell.

# FOURTH ANNUAL REPORT.

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*September 28th, 1852.*

GENTLEMEN,

I BEG leave to lay before your Hon. Court the several tables\* which I have prepared, to illustrate the mortality of the City of London during the past year. They refer to fifty-two weeks, dating from September 28th, 1851, to September 25th, 1852.

In the first table I have distributed the 3064 deaths of the period, according to their localities and seasons; showing them as they occurred, male and female, during each quarter of the year, in the several districts and sub-districts of the City. For the foot of each column, I have calculated the year's death's rate, per thousand of the living, in the district or sub-district referred to; and at the head of the columns, for facility of reference, I have introduced an analysis of the population, founded on the Registrar-General's recent census.

In the second table all the deaths of the last four years are stated, in a form which will enable you to compare one year with another, and one sub-district with another, in respect of their several contributions to the total mortality of the period.

In the third table 12,540 deaths† of the last four years are classified according to the ages at which they befell. This table is

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\* These tables are not here reprinted in a separate form, except the enumeration of deaths for the year, which is No. VI. in the Appendix. The others are embodied in the different quinquennial tables of the Appendix.

† In the remaining number (17) the particulars of age and residence could not be correctly ascertained.

arranged in a manner to display its results, first for each year separately, and next for each Union separately; in order that you may observe what local or annual differences have obtained as to the ages of chief mortality.

The fourth table also relates to the last four years. It restricts itself to those various forms of acute disease—epidemic, endemic, and infectious, which occasion, most of all, the predominant mortality of particular districts or seasons; and which are susceptible, in the highest degree, of being mitigated or removed under an efficient sanitary system.

In their general import these documents agree very nearly with last year's record; though showing unfortunately a somewhat higher death-rate (23·62) and especially a larger proportion of fever.

On former occasions I have examined, with great minuteness, all such facts as these tables set forth, and have offered you the best suggestions in my power for the mitigation of preventable disease.

The sanitary condition of the City is now substantially the same as at the date of my last Report; and any comment which I might make on the present tables could be little else than a repetition of arguments already submitted to your notice.

Therefore, as other topics\* of importance to the health of the City press for more immediate consideration, I refrain from occupying your time by any further remark on the materials which I subjoin.

I have the honour,

&c., &c.

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\* We were at this time closely occupied in considering the general questions of extramural interment for the City.—J. S., 1854.



## FIFTH ANNUAL REPORT.

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*November 29th, 1853.*

GENTLEMEN,

ACCORDING to the practice of previous years, I lay before you, in the annexed tables, a brief digest of your death-register for the fifty-two weeks which terminated at Michaelmas last.

The deaths there enumerated amount to 3040—being 24 fewer than in the last preceding similar period.

Beyond these statistics of the past year, there are other facts which I have thought it well to tabulate for your information. They relate to the entire term of five years, during which I have kept record of your mortality. Mid-way in this quinquennial period—namely, in the spring of 1851, the general census happened to occur. The inhabitants of the City, then enumerated, may fairly be taken to represent the mean of your somewhat fluctuating population; and the five years' mortality, compared with the numbers of this mean population, will express pretty accurately their habitual death-rate.

The period mentioned is indeed short for the purpose of establishing an average; but ten years at least must elapse before even similar materials can again be given for calculation, and a still longer time before the statistical basis can be enlarged. I have therefore thought it desirable to make the best use in my power of such facts as were before

me, for the construction of quinquennial tables; out of which, with sufficient accuracy for all practical purposes, you may draw your own inferences as to the health of that large population which is under your sanitary government.

The facts are classified, as heretofore, in the manner which will most easily display their practical meaning. First, namely, the deaths of the period are recorded in their local distribution, so that you may compare one part of the City with another in respect of healthiness. Next, they are so tabulated according to ages, as to indicate the prevailing proportion of untimely death. Thirdly, those of them are separately enumerated which, in their several classes, chiefly occur as results of acute disease in connexion with removable causes.

In after years, when sanitary improvements, now only in contemplation or commencement, shall have produced their legitimate results and rewards, these tables may serve an important use. Indicating the standard of public health within the City before such works were achieved, and constituting a permanent record of your starting-point, they will qualify your successors to estimate the amount of amelioration which your endeavours shall have produced.

The details of your present sanitary condition, as varying in different sub-districts of the City, and as fluctuating in the several years and seasons of the quinquennial period, are expressed in the figures of these tables more compendiously and more clearly than I could hope to convey them in words. Here, therefore, I restrict myself to telling you very briefly their general results.

The population of the City—about 130,000 persons—has

been dying during these five years at the rate of about 24 *per thousand per annum*. The sub-district rates which give this aggregate vary from under 18 to above 29; the former death-rate belonging to your healthiest locality—the north-west sub-district of the City of London Union; while the latter—more than 60 *per cent.* higher—mortality belongs to the north sub-district of the West London Union. The lowest death-rate hitherto attained in this country for a considerable population, during a term of seven years, has been 14 *per thousand per annum*; which your worst sub-district mortality more than doubles.

As different districts contribute unequally to your average death-rate, so also do different ages. Among all the population exceeding five years of age, the death-rate is under 17 *per thousand per annum*; while, for children under five years of age, the rate is nearly 85. And these rates are unequally constituted by your three chief districts in the following proportion; viz.:—

| Annual Rate of Deaths to 1000<br>living persons. | Over 5 Years<br>of age. | Under 5 Years<br>of age. |
|--|-------------------------|--------------------------|
| East London Union . . . . .                      | 16·68                   | 91·99                    |
| West London Union . . . . .                      | 20·58                   | 94·84                    |
| City of London Union . . . .                     | 15·06                   | 71·72                    |
| Average death-rate in the City                   | 16·85                   | 84·72                    |

How various are the diseases which have conspired to produce your annual average of 3120 deaths, it would be tedious to describe; and in the table which I have devoted to a partial analysis of this subject, I have restricted myself to a consideration of those ailments which are likely to become less fatal under a well-developed sanitary system.

To the annual average typhus has contributed 140 deaths; choleraic affections (including the epidemic of 1849) 196; scarlet fever, 76; small pox, 40; erysipelas, 30; the acute nervous and mucous diseases of children, 572; their measles, whooping-cough, and croup, 182;—making, from this class of disorders, an annual average of about 1250 deaths—nearly two-fifths of the entire mortality.

My tables will show you that the different seasons of the year have pressed somewhat differently on human life; and there is exhibited in them a point of some interest to which I would beg your attention. In your healthier sub-districts it is easy to perceive the influence, the almost inevitable influence, exerted by the inclemency of winter against the aged and feeble. In your unhealthier sub-districts, this effect is completely masked, and summer becomes the fatal season; its higher temperature acting in some sort as a test of defective sanitary conditions, and giving to the several local causes of endemic disease an augmentation of activity and virulence.

On the facts which these tables set forth, I have nothing further to say than would consist in a repetition of arguments already submitted to your notice. In my third Annual Report, especially, I endeavoured to lay before you the conclusions which are fairly deducible from the proportions of early death, and from the partial allotment of particular diseases.

These conditions, indeed, are in obvious mutual relation. To human life there has been affixed a normal range of duration; and when it prematurely fails—when children perish in the cradle, or adults amid the glow of manhood, the exception in every case is a thing to be investigated and

explained. Of the 15,597 persons who have died within your jurisdiction, not an eighth part had reached the traditional 'threescore years and ten;' while nearly three-eighths died in the first five years of life. In proportion as facts like these appear in the death-tables of a particular district, in the same proportion we can trace the local prevalence of particular diseases, to explain the abridgment of life; and passing from such a locality to other districts, where the natural term of existence is more nearly attained, invariably we find that these diseases have fallen into comparative inertness. Finally, in grouping the fatal results of such diseases in their proportionate geographical allotment, invariably we find that their prevalence or non-prevalence, here or there, has been associated with demonstrable physical differences; that life has not capriciously been long in one place and short in another, but that, where short, it has been shortened; that its untimely extinction has depended on the direct operation of local and preventable causes.

In this recognition of cause and effect, which the experience of late years has rendered vivid and precise; and in that higher appreciation of human life, which belongs to civilized nations in peaceful times; and in that deeper sympathy for the suffering poor, which should be at the heart of every Christian government, sanitary legislation had its origin in this country; and it has been the good fortune of the City of London (in respect of your two Acts of Parliament) to precede the rest of the metropolis in acquiring and exercising authority for the mitigation of preventable disease.

Nearly five years have now passed over your tenure of

this very grave responsibility; and although in many respects the period must be regarded as one of apprenticeship to a new and difficult career—although you have hardly yet arrived at what may permanently represent your method of action—although important changes which you have determined to adopt are not yet in actual working—although the far greatest evils still remain for correction—yet I rejoice to inform you that sensible improvement has already shown itself in the sanitary state of your population. My comparison of the past five years with any considerable previous period cannot be as precise as I would wish, owing to the absence of circumstantial records for the time anterior to my appointment; but, judging from such information as I can consult on the subject, I am induced to believe that the deaths, for equal numbers of population, are about four *per cent.* fewer than before your Acts of Parliament came into operation, and that the disproportionate mortality of children is decidedly lessened.

On this first improvement—the beginning, I would fain hope, of a long series of similar steps for regaining the allotted duration of human life, I beg to offer my respectful congratulations to your Hon. Court, under whose auspices it has been effected. Further impetus in the same direction will shortly be given by the removal of sanitary evils, already in fact or in principle condemned. The approaching institution of your extramural cemetery, and, I venture to hope, the translation of all slaughtering establishments to the site of your new Smithfield, will be important contributions to this effect. I therefore make bold to speak with some sanguineness of the slight change of death-rate already noticed; though, while so much remains to be

accomplished, I doubt not you will welcome the amelioration rather as an encouragement to proceed, than as the final reward of a completed task.

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Here, Gentlemen, terminates all that I have to submit for your consideration in respect of your past and present record of deaths. The greater extension which, during the last two years, I have given to my habitual Weekly Reports, and to sundry occasional statements which it has been my duty to lay before you, may seem, at least generally, to render it superfluous for my Annual Report to contain anything beyond such statistical particulars as I have now brought under your notice. But, however this may generally be, there exist exceptional circumstances at the present time which induce me to trouble you at somewhat greater length.

II. Two years ago—adverting to the non-completion of metropolitan sanitary works, on which the health of entire London is vitally dependent, I could not but comment\* on the utter unpreparedness with which the metropolis was awaiting any sudden return of Asiatic cholera. It was indeed impossible to foresee how soon, or how late, that dreadful visitation might recur to desolate our homes—whether it might return at once, or never. But typhus—averaging in fifteen years double the fatality of that rarer epidemic—was adding day by day to its list of preventable

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\* Third Annual Report, p. 206.

deaths; and other endemic diseases were co-operating with it, demonstrably, uninterruptedly, to decimate, impoverish, and abase the people.

Whatever doubts might have existed as to a return of the foreign pestilence were soon solved: whatever hasty conclusions had been formed, as to its again remaining absent during half a generation, were soon disappointed and reversed. Even while I was addressing you on the subject, the plague had again kindled its smouldering fire, and was widening its circle of destruction. Perhaps from the eastern centres of its habitual dominion—from the alluvial swamps and malarious jungles of Asia, where it was first engendered amid miles of vaporous poison, and still broods over wasted nations as the agent of innumerable deaths; or perhaps from the congenial flats of Eastern Europe, where it may have lingered latent and acclimatised; the subtle ferment was spreading its new infection to all kindred soils. Repelled again from the dry and airy acclivities of the earth, and their hardier population, it filtered along the blending-line of land and water—the shore, the river-bank, and the marsh. Conducted by the Oder and Vistula from the swamps of Poland to the ports of the Baltic, it raged east and west, from St. Petersburg to Copenhagen, with frightful severity, and, obedient to old precedents, let us witness its arrival at Hamburg.

Twice in the European history of cholera, had this town seemed the immediate channel of epidemic communication to our island; the disease having on each occasion commenced in our north-eastern sea-ports within a very short time of its outburst there. A third time, not unexpectedly, has this dreadful guest, following the line of former visita-



tion, touched upon the banks of the Tyne; where\* a worse than beastly condition of the crowded poor, and sewage-water diluted through the people's drink, had prepared it an appropriate welcome.

Next, the disease was rumoured to be in London. Hope and belief are too near akin for this not to have been doubted and denied; but the last few weeks have shown, with sad incontrovertible certainty, that after only four years absence, Cholera has again obtained its footing on our soil. Six or seven hundred deaths, registered in the metropolis since the beginning of September, have already attested its presence.

Anxiously adverting to the future, and asking what may be the onward progress of the disease, we can appeal only to a narrow experience. Before us lie the records of but two complete visitations of the disease, and the commencement of this, the third. It would be a shallow philosophy that should pretend, from two observations, to predict the possible orbit of this obscurely wandering plague.

Yet I dare not disguise from you that such knowledge as we have, to justify scientific anticipation, is pregnant with threats and gloom. For—let me remind you of the past. At each former period of attack, the infection, after a certain course over Continental Europe, struck upon our eastern coast in the summer of an unforgotten year. In the northern parts of Great Britain, so soon as it had lit among the population, each time it burst forth into ex-

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\* Having had recent occasion to examine judicially into the matters here adverted to, I think it proper to mention that the allusions in my text were long prior to this examination, and were founded chiefly on the Registrar-General's Reports of the time, with other official statements.—J. S., 1854.

plosive activity, and worked its full measure of destruction without delay. More faintly it reached the South. On each occasion, indeed, at the close of summer, London was sensibly affected by the disease; but, we hoped, under a milder infliction. Here and there, within its Bills of Mortality (as at Tooting in 1848) there was thrown some astounding flash on a particular hot-bed of co-operating poison; but on the whole it seemed to the sanguine, on each occasion, that the fury of the epidemic was expending itself in our northern towns, and that the metropolis was to be comparatively spared.

Each time, at the commencement of the new year, our London mortality from Cholera seemed stationary within the limit of a few hundred deaths. Each time winter and spring allowed a long respite to our invaded City, and confirmed the omens of the hopeful.

But each time there was disappointment. Each time, as the warmth of summer requickered the exterior conditions of chemical activity, the dormant fire kindled afresh—slowly at first, but with speedy acceleration of rate. Each time, in the few weeks before Michaelmas—amid almost universal threatenings of the disease, and amid such panic of death as the metropolis had not known since the Great Plague, there suddenly fell many thousands of the population.

Thus then our position stands. Scientific prediction of phenomena can arise only in the knowledge of laws. That the phenomena of this disease, however capricious they may seem, are obedient to some absolute uniformity as yet beyond our ken—are enchained by that same rigid sequence of cause and effect which is imposed on all remaining Nature—it would be impossible to doubt. But these conditions are hitherto unknown to science. Hitherto we can

speaking of the facts alone, with a short empirical knowledge of their succession. Yet in this light, such as it is, the conclusion is only too obvious. If the disease, already notorious for a tendency to return on its former vestiges, repeat on this third occasion the steps of its two previous courses; or, perhaps I should rather say, if it now proceed consistently to complete a repetition which it has already half-effected; Asiatic Cholera will be severely epidemic in London in the third quarter of next year—will proceed, with a stern unflattering test, to measure the degree in which those promises of sanitary improvement have been redeemed, which the terror of its recent visitation extorted even from the supinest and most ignorant of its witnesses.

In the face of so great a danger, you will reasonably claim of your Officer of Health that he shall report to you, how far the City is already fortified against this dreadful invasion—how far the hygienic defences of life, if weak, may be strengthened—how far there remain breaches now insusceptible of repair.

1. It forms an all-important part of these considerations for resistance to the disease, to recognise quite accurately what is its fashion of attack. Since I last addressed you on the subject, in my Report for 1849-50, the materials for correct generalisation have been very largely increased by Dr. Farr's admirable Report to the Registrar-General on the Cholera in England, and by numerous other important publications. By collating with these works the more restricted, yet not unimportant, experience which arose within your particular jurisdiction, I hope to have enlarged my knowledge of the subject, and to have become able with greater confidence to submit my conclusions for your acceptance.

The first and most obvious characteristic of the disease is its preference for particular localities. It is eminently a district-disease. And the conditions which determine its local settlement are demonstrable physical peculiarities.

After carefully reviewing the subject, I do not know that I need qualify, except to express more confidently, the account I formerly gave you of those peculiarities, as consisting in the conjunction of dampness with organic decomposition.

It is in respect of these conditions—especially among dense urban populations, that the level of occupied ground, relatively to the nearest water-surface, becomes of primary importance. The low level, in itself, or rather in respect of the watery dampness which it implies, is not enough to localise the pestilence. To be afloat at sea might be the safest lodging.

The sub-district of St. Peter's, Hammersmith, averages only four feet above high-water level; that of St. Olave's, Southwark, two feet higher; yet among the former and worse placed of these two populations, the Cholera-mortality was only 18 per 10,000; while among the latter and better placed it rose to 196—multiplying nearly eleven times the minor phenomena of a lower level. So also within your own jurisdiction. Side by side along the river lie four of your sub-districts; three at the elevation of twenty-one feet, one at the elevation of twenty-four feet. The Cholera-mortality, if simply proportioned to level, should have been nearly the same for these four sub-districts, but somewhat less in the last one than in the first three. Yet contrary was the fact; for in two of these sub-districts the Cholera-mortality, for equal numbers of population, was  $4\frac{1}{2}$  times as great as in the other two.

It would, therefore, appear that in certain low-lying levels—to constitute them favorable soils for the disease, there must be joined to their first condition of lowness (with the mere watery dampness which it implies) some other and second condition; one, which is of extreme frequency in such districts, though not essentially present there.

This second condition impends wherever there dwells at such levels a certain density of population; *it mainly varies with the degree in which that dense population lives in the atmosphere of its own excrements and refuse.* In this respect I cannot refrain from saying, that the giant error of London is its present system of drainage. Probably in considerable parts of the metropolitan area, house-drainage is extensively absent: probably in considerable parts, the sewers, from the nature of their construction, are very doubtful advantages to the districts they traverse: but the evil, before all others, to which I attach importance in relation to the present subject, is that habitual empoisonment of soil and air which is inseparable from our tidal drainage. From this influence, I doubt not, a large proportion of the metropolis has derived its liability to Cholera. A moment's reflection is sufficient to show the immense distribution of putrefactive dampness which belongs to this vicious system. There is implied in it that the entire excrementation of the metropolis (with the exception of such as, not less poisonously, lies pent beneath houses) shall sooner or later be mingled in the stream of the river, there to be rolled backward and forward amid the population; that, at low water, for many hours, this material shall be trickling over broad belts of spongy bank which then dry their contaminated mud in the sunshine, exhaling fœtor

and poison; that at high water, for many hours, it shall be retained\* or driven back within all low-level sewers and house-drains, soaking far and wide into the soil, or leaving putrescent deposit along miles of underground brickwork, as on a deeper pavement. Sewers which, under better circumstances, should be benefactions and appliances for health in their several districts, are thus rendered inevitable sources of evil. During a large proportion of their time they are occupied in retaining or re-distributing that which it is their office to remove. They furnish chambers for an immense fæcal evaporation; at every breeze which strikes against their open mouths, at every tide which encroaches on their inward space, their gases are breathed into the upper air—wherever outlet exists, into houses, foot-paths, and carriage-way.

To you, Gentlemen, as Commissioners of Sewers for the City of London, these remarks may seem superfluous; the rather so, as the worst evils of tidal drainage are not largely exemplified within your jurisdiction. But it seems to me of extreme moment at the present time, when very costly improvements of the metropolitan drainage are about to undergo parliamentary discussion, that the public should be well aware how indispensable such improvements are for the general health of London, and how important, in fact, they are to thousands who at first sight might think themselves little interested in their completion.

To some individual householder, dwelling at a high

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\* I am informed that in large districts on the south side of the river, this retention of sewage is prolonged for two-thirds of every tide—sixteen hours out of every twenty-four.

level, all concern in the subject may seem to terminate with the defluxion of his own sewage. So that his own pipes remain clear, little cares he for the ultimate outfall of his nuisance! Perhaps, if he knew better, he would care more. His gift returns to him with increase. Down in the valley, whether his refuse runs, converge innumerable kindred contributions. From city and suburb—from an area of a hundred square miles covered by a quarter of a million of houses, with their unprecedented throng of metropolitan life, there pours into that single channel every conceivable excrement, out-scouring, garbage and refuse, from man and beast, street and slum, shamble and factory, market and hospital. From the polluted bosom of the river steam up, incessantly though unseen, the vapours of a retributive poison; densest and most destructive, no doubt, along the sodden banks and stinking sewers of lowest level; but spreading over miles of land—sometimes rolled high by wind, sometimes blended low with mist, and baneful, even to their margin that curls over distant fields. For, not alone in Rotherhithe and Newington—not alone along the Effra or the Fleet, are traced the evils of this great miasm. The deepest shadows of the cloud lie here; but its outskirts darken the distance. A fever hardly to be accounted for, an infantile sickness of undue malignity, a doctor's injunction for change of air, may at times suggest to the dweller in our healthiest suburbs, that while draining his refuse to the Thames, he receives for requital some partial workings of the gigantic poison-bed which he has contributed to maintain.

The subject of these remoter effects I refrain from pursuing, as foreign to my present purpose. That on which I wish to insist is the character of the river, in its relation to

the marginal sub-districts which it habitually dampens and occasionally floods with putrescent soakage, and in its relation to the sewers of low gradient which it converts (often with their adjoining soil) into the similitude and hurtfulness of cesspools. I wish emphatically to point out, that the several parts of London have suffered, and are likely again to suffer, from Cholera, in proportion as either this malarious influence is exerted on them, or other kindred miasms are furnished by their soil. And it is my belief, from such evidence as is before me, that the general liability of London to suffer the epidemic visitation will cease, whenever an efficient and inodorous system of drainage, conveying all refuse of the metropolis beyond range of its atmosphere, shall be substituted for our present elaborate disguise of an unremoved nuisance. I deem it right to state this explicitly: not only because it is my duty to give you, in simple truth, the conclusions to which I am led by careful reflection on the facts; but likewise because—for the credit of sanitary medicine and for your justification in the awful presence of a recurrent pestilence within your jurisdiction—it ought to be thoroughly known how much of the cause is common to the entire metropolis, and has not admitted of removal by measures of partial improvement. And the circumstances will perhaps excuse me if I repeat to your Hon. Court—represented as you are both in the Metropolitan Commission of Sewers and in Parliament, where this question must shortly be discussed—that the universal reform of our metropolitan drainage, at whatever imaginable pecuniary cost, is an urgent claim and necessity, unless this great city is again, as two centuries ago, to



live under the constant alarm of increasing epidemic destruction.

Reverting, however, to the more especial relations of the disease within your territory, you will remember that, among your four bank-side sub-districts, two suffered in marked excess; their Cholera-mortality having been  $4\frac{1}{2}$  times as great as that of the other two. The fact is instructive; because those two suffering sub-districts (though not of lower mean level than the others) were marginal to the valley of the Fleet, and were therefore exposed, more than any other part of your province, to the class of evils I have described. For a considerable part of this locality may be regarded as but recently\* a creek of the Thames; its shelving banks, singularly foul from ancient misuse, though now built over and paved, undergo in their lower levels very considerable soakage; while those vast sewers which lie in the mid-channel of the former river, are more liable than any within your jurisdiction, to suffer injurious interference from the action of the tide. At every such interference, and at every current of air setting up the sewers, all gases generated in these large chambers would diffuse themselves, not only in the low level, but likewise widely east and west, up those important slopes which depend on this valley for their drainage. I can easily understand that the radical cure of this district may be possible, only as part of those metropolitan improvements

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\* New Bridge Street was built over the Fleet in 1765. The present site of Farringdon Street had been arched in thirty years earlier, for the purposes of the Fleet Market.

to which I have adverted ; but I do think it of supreme importance, in reference to any such visitation as we dread, that, during the next twelve months, there should be taken every precaution which technical knowledge can suggest, for restricting, even by palliative and temporary expedients, those mischievous effects which I have endeavoured to illustrate.

In describing to you the local affinities of cholera, I have intimated that, in its preference for our low metropolitan levels, it selects these soils specifically in respect of their being damp with organic putrefaction. A moment's consideration will suffice to show that, if this be true, the higher levels of the metropolis will be exempt from the disease, only in proportion as they exempt themselves from the local conditions which invite it—only in proportion as they avail themselves of those natural advantages which their situation enables them to command. Let a district be defective in house-drainage, so that its soil is excavated by cesspools and sodden by their soakage ; let its sewers be ill-constructed and foul, so that offensive gases are ventilated into the immediate breathing-air of the inhabitants ; let its pavement be absent or imperfect, scattered with refuse and puddled with water ;—you will easily conceive that, under these circumstances, all distinctions of level are merged in the strong identity of filth, and whatever diseases belong to putrefactive dampness of soil will strike here as readily as on the low-lying mud-banks of the river.

So, likewise, in still narrower limits—the predisposition of a house to Cholera may be stated in the same terms as define the liability of a district—viz., that the humid gases of organic decomposition, in proportion as they

are breathed into one house in a district more than into other houses there, will engender the greater liability of that house, as compared with its collaterals, to suffer an invasion of Cholera. And thus it often happens, during epidemic prevalence of the disease, that sporadic cases are determined in localities which might generally claim to be free from infection: for, what avails it to be on the highest ground and the best soil, with every neighbouring facility of sewers and scavenging, if, owing to individual carelessness and filth, the conditions of dampness and putridity are by choice retained within a house, and its basement flooded with rotting liquids, or piled with accumulated refuse?

I might give you many instances in illustration of these points—showing you how, under the operation of specific sanitary faults, the Cholera-mortality of districts acquires an artificial exaltation; but few comparisons will suffice. At the period of the epidemic of 1849, your best conditioned sub-district was the north-west of the City of London Union; and (among those of the same level) your worst was the sub-district of Cripplegate, which at that time was in a very unsatisfactory state, abounding in open cess-pools and their consequences. In the former of these sub-districts the Cholera-mortality *per* 10,000 was 19; in the latter 47; and it is easy to show that additional sanitary errors soon develop a larger fatality. Not far from your boundary, at the same level with these two sub-districts, in the Hackney-Road division of Bethnal-Green, it rose to 110; this large mortality being principally confined to a very small portion of the district, wherein (the local Registrar reports) sewers were almost entirely absent, houses were contaminated with the filth of years, streets

were remaining for days uncleansed from accumulating dirt, and all waste water (including animal secretions) was uniformly thrown into the public way.

Such are the conditions under which, at any imaginable height in the metropolis, Cholera may decimate a population: such, in their worst form, were the conditions which at Merthyr-Tydvil—several hundred feet above the water-level, carried the Cholera-mortality to more than double the high metropolitan rate just mentioned. Taught by this case the power of human mismanagement to futilise the favours of Nature; taught that perverse ingenuity can construct poison-beds for the development of Cholera, high above the usual track of its devastation; one gladly turns from the horrible instructiveness of such a lesson, to gather the kindred evidence of contrast: and happily there is abundant evidence to show how much may be effected, even in the most tainted districts, to purchase a circumscribed exemption from the disease by the judicious application of sanitary care.

In the remarks which I have made on the local distribution of Cholera, you will have observed that I dwell particularly on one class of sanitary evils as concerned in its production; on that class, namely, which consists in the retention and soakage of organic refuse—on that class, which has its appointed antidote in a system of inodorous drainage, of uninterrupted pavement, of complete and punctual scavenging.

On this I particularly insist, because I believe that here is the very atmosphere without which Cholera would cease.

Sanitary evils abound; and, if I were speaking of other

diseases, I might have more to say of other causes. I am unwilling, even for a moment, to seem indifferent to those remaining fertile sources of suffering that surround the poor of our metropolitan population—to their over-crowded condition, to their scantiness of ventilation, to their insufficient or disgusting water-supply, to their frequent personal dirt, to their habitually defective diet. These several influences have their own characteristic sequels and retribution, on which I have often addressed you, and which I am little likely to underrate; believing, as I do, that, in the lapse of years, the aggregate of their effects is far more fatal than any periodical epidemic visitation. Likewise, I cannot doubt that, under certain circumstances, and in respect of particular cases, they may assist the operation of the choleraic poison. Nor will I pretend so exactly to limit the affinities of that which evolves this poison, as to deny that rooms, fœtid with animal exhalations, may (like cesspool-sodden cellars) be ready to answer the stimulus of its infection. And at any rate, I think it highly important to recognise that all sanitary defects which embarrass the excretive purification of the human body—whether by breathing or otherwise, do naturally tend in the same direction as the causes of Cholera, and are liable—if only by indirect means, to become accessory in its destructive work.

But, deeply impressed as I am with the importance of these considerations, I esteem it of still higher consequence, if measures are ever to be taken for an effective prevention of the disease, that the principle of its *specific causation* should be steadfastly kept in view. What may be the exact chemistry of this process, I do not pretend to say: urging only, that, in all human probability, the poison arises in

specific changes impressed by some migratory agent upon certain refuse-elements of life. Perhaps nowhere, and certainly not before your Hon. Court, can it be desirable, in the present immaturity of pathological knowledge, to argue as to the first origin or absolute nature of that wandering influence which determines in particular localities the generation of epidemic malaria. Simply, since it leads to all-important practical conclusions, let this distinction be recognised: that which seems to have come to us from the East is not itself a poison, so much as it is a test and touch-stone of poison. Whatever in its nature it may be, this at least we know of its operation. Past millions of scattered population it moves innocuous. Through the unpolluted atmosphere of cleanly districts, it migrates silently, without a blow: that which it can kindle into poison, lies not there. To the foul, damp breath of low-lying cities, it comes like a spark to powder. Here is contained that which it can swiftly make destructive,—soaked into soil, stagnant in water, griming the pavement, tainting the air—the slow rotteness of unremoved excrement, to which the first contact of this foreign ferment brings the occasion of changing into new and more deadly combinations.

These are matters which it is hateful to hear, and, believe me, to speak about. But the thing is worse than the statement; and I would suggest to you this easy test of its reality. Take at random any consecutive hundred entries of Cholera-Deaths in the Registrar-General's metropolitan returns, where local conditions are described; and let any man decide for himself, whether what I have sketched in general terms convey more than the essential features of

these several records. In 1849, such an atmosphere as these influences engender existed continuously and intensely on the low-lying south side of the river, and to some distance inland, from Greenwich to Wandsworth; it existed also continuously, but in far less intensity, and with comparatively little extension inland, along the northern side of the river from Poplar to Chelsea, and it existed very intensely in several independent centres, scattered about those healthier levels of the metropolis, which, by their better position, ought to have been exempted from such a reproach. The Cholera struck in the same proportion as this atmosphere prevailed; and herein, I repeat, lies that definite local condition, except for which—to the best of my knowledge and belief, the migratory ferment (whatever it may be) would pass harmlessly through the midst of us.

For, towards the chemical constitution of local atmospheres, it seems that the several principles of epidemic diseases stand in the same sort of fixed respective relations, as do the several principles of infective fevers towards certain elements in the blood of individual persons. Just as the infective ferment acts on man, so appears the epidemic ferment to act on locality. We know that, in a given group of human beings, small-pox chooses one victim, scarlatina another, measles a third, by reason of some material quality in each person respectively, which his blood possesses, and which his neighbour's blood does not possess. By virtue of this quality—not the less chemical because chemists have no name for it, that specific exterior agency, which we call infection, has the power of affecting each such person—has the power of producing in him a succession of characteristic

chemical changes which tend to an eventual close by exhausting this material which feeds them.\*

Strictly analogous to this, in its principle of choice and in its method of operation, appears the epidemic action—not on persons indeed, but on places. The specific migrating power—whatever its nature, has the faculty of infecting districts in a manner detrimental to life, only when their atmosphere is fraught with certain products susceptible, under its influence, of undergoing poisonous transformation.

These products, it is true, are but imperfectly known to us. Under the vague name of putrefaction we include all those thousand-fold possibilities of new combination, to which organic matters are exposed in their gradual declension from life. The birth of one such combination rather than another is the postulate for an epidemic poison.

Whether the ferment, which induces this particular change in certain elements of our atmosphere, may ever be some accident of local origin, or must always be the creeping infection from similar atmospheres elsewhere similarly affected; whether the first impulse, here or there, be given by this agency or by that—by heat, by magnetism, by planets or meteors—such questions are widely irrelevant to the purpose for which I have the honour of addressing you. The one great pathological fact, which I have sought to bring into prominence for your knowledge and application,

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\* For the scientific reader, I may perhaps be permitted to add, that the very difficult subject, at which here I can only venture to glance, is discussed at some length in one of my Pathological Lectures, delivered at St. Thomas's Hospital in 1850, published at that time in the *Lancet*, and subsequently reprinted.—J. S., 1854.



is this:—that the epidemic prevalence of Cholera does not arise in some new cloud of venom, floating above reach and control, high over successive lands, and raining down upon them without difference its prepared distillation of death; but that—so far as scientific analysis can decide, it depends on one occasional phase of an influence which is always about us—on one change of materials which in their other changes give rise to other ills; that these materials, so perilously prone to explode into one or other breath of epidemic pestilence, are the dense exhalations of animal uncleanness which infect, in varying proportion, the entire area of our metropolis; and that, from the nature of the case, it must remain optional with those who witness the dreadful infliction, whether they will indolently acquiesce in their continued and increasing liabilities to a degrading calamity, or will employ the requisite skill, science, and energy, to remove from before their thresholds these filthy sources of misfortune.

2. If, gentlemen, I have detained you long in stating conclusions as to the habits of the disease, and as to the significance of its local partialities, it has been in order to render quite obvious to you the intention of those precautionary measures which it is now my duty to recommend.

First, I would allude to influences of an exterior and public kind; and here, all that I have to advocate might be included in a single stipulation, that cleanliness—in the widest sense of the word—should be enforced to the full extent of your authority.

Over the pollutions of the river, and over the tidal exposure of its malarious banks, you have no power.

Whether for the relief of your low-lying districts—subject to imminent risk from causes I have described—there can be found any temporary protection to save their atmosphere from contamination, is a question which you will resolve upon other judgment than mine.

Along the river-bank there is one especial source of nuisance which has repeatedly been under your notice, and which is likely to become of serious local import under the presence of epidemic disease. I refer to the docks, and chiefly to that of Whitefriars. I mention it particularly, not only because the accumulations of putrid matter there have often been alarmingly great, but likewise because, at the head of this dock, during the former invasion of Cholera, there was remarkable prevalence of the disease; and I can well remember how often the offensive condition of the dock was accused, not unjustly, of contributing to the mortality of the neighbourhood. The fœtid materials, floated into these several recesses of the river, and left stranded there by the receding tide, are often so copious as to produce very objectionable effects on the atmosphere which surrounds them; and I would beg leave strongly to urge that such sources of nuisance should be thoroughly and permanently removed.

Further—from what I have said as to the conditions of our vulnerability by Cholera, you will be prepared to think it of great importance that, during the next six months, you should be certified on the state of your sewers, in every part of the City, as to their greatest possible cleanliness and least possible offensiveness of ventilation. Fifty miles of sewer, reticulated through the City, sufficiently attest your active desire to provide for the complete and continuous

carrying away of all excremental matters: and you will excuse me, I hope, in consideration of the anxieties of my office, if I seem superfluously cautious in reminding you that the test of successful sewers lies in an inodorous fulfilment of their duty, and that every complaint of offensive emanations indicates, in proportion to its extent, a failure of that sanitary object for which the construction was designed.

There is one precaution—always of great value to the health of towns, and especially useful against any malarious infection, which happily I find it needless to recommend. The paving of all public ways within the City—including every court and alley—is already so complete as to constitute a very favorable point in your sanitary defences. In order that this excellent arrangement may give its full fruit, it will be requisite—though this again I need hardly press on your consideration, that the duties of scavengers and dustmen be thoroughly and punctually performed.

Again, I would particularly advise that great vigilance be exercised in all markets, slaughtering-places, and other establishments under your jurisdiction, to prevent the retention of refuse-matter, animal or vegetable. I would urge the strictest enforcement of all regulations which you have made for the cleanliness of such places, and for the removal of their putrefiable refuse.

Likewise, I have to suggest that after the month of May, at latest, no disturbance of earth to any considerable depth should be allowed to take place, either in your works or in those of gas and water companies, except under circumstances of urgent necessity. In the lower levels of the City, particularly, I conceive this prohibition to be a matter

of paramount importance; because the soil, never of unexceptionable cleanliness in towns, is here especially apt to be of offensive quality.

On the subject of water in its general relations to the City, I have only again to express my deep regret that it lies out of your present power to compel a continuous supply, and that your means are restricted to choosing what may best compensate for the absence of this sanitary boon. It must be your aim to mitigate, so far as may be, the evils that belong to an ill-regulated intermittent system in its adaptation to the houses of the poor—evils which imply, as I have often told you, not only much domestic dirt, but likewise a frequent suspension of all efficiency in the drainage of innumerable houses. With a view to the best alternative for a continuous supply, I would recommend that at least a daily filling of all cisternage take place, and expressly that Sunday form no exception to the advantages of this rule. If a choice of evils must be made, I trust it is no heathen's part to urge that the Christian Sabbath suffers more desecration in the filth and preventable unwholesomeness of many thousand households, than in the honest industry of a dozen turncocks. I likewise submit, that it would be highly advantageous to the labouring poor, most of whose domestic cleansing is reserved for the last day of the week, that, on that day, a second delivery of water should take place at some hour in the afternoon.

I wish it were in my power to tell your Hon. Court that the supply of water to the City of London had become, in quality, all that I think it might be rendered. Such as it is, however, there depend other very important

issues on its being delivered in ample abundance for all the purposes of cleanliness; and I am glad to have learned from the eminent engineer of the New River Company, that he has it in expectation very shortly to be able to furnish to the City a largely increased and practically inexhaustible supply.

The subject of water in its district relations ought hardly to be passed without a word of caution as to the use of pumps within the City. I need hardly inform you that every spring of water represents the drainage of a certain surface or thickness of soil, and that—such as are the qualities of this gathering ground, such must be the qualities of the water. You will, perhaps, remember that in my account of one celebrated City pump, which sucks from beneath a churchyard, I showed you ninety grains of solid matter in every gallon of its water. In virtue of that wonderful action which earth exerts on organic matter, the former contents of a coffin, here re-appearing in a spring, had undergone so complete a change as to be unsusceptible of further putrefaction: the grateful coolness, so much admired in the produce of that popular pump, chiefly depending on a proportion of nitre, which arises in the chemical transformation of human remains, and which being dissolved in the water, gives it, I believe, some refrigerant taste and slight diuretic action. Undoubtedly this water is an objectionable beverage in respect of its several saline ingredients; but my present object in adverting to them is rather to illustrate an anterior danger which they imply. Their presence indicates a comparative completion of the putrefactive process, effected by the uniform filtration of

organic solutions through a porous soil.\* Let that soil have frequent fissures in its substance; or let its thickness be scanty in proportion to the organic matters to be acted on: and the water, imperfectly filtered, would run off foul and putrescent. Now this risk, more or less, belongs to all pumps within the City of London. They draw from a ground excavated in all directions by sewers, drains, cess-pools, gas-pipes, burial-pits. The immense amount of organic matter which infiltrates the soil does undoubtedly, for the greater part, suffer oxidation, and pass into chemical repose: but in any particular case it is the merest chance, whether the glass of water raised to the mouth shall be fraught only with saline results of decomposition—in itself

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\* This very important influence, exerted by the earth on various organic infiltrations, is referred to in the text only under one point of view; only as it occasions the deterioration of land-springs in urban districts, and renders their water unfit for consumption. But the subject has another equally important side. Such springs, having their waters laden with nitrates, represent the continuous removal of organic impurities which otherwise would contaminate the air. The evil of spoiled springs, therefore—while it necessitates for every urban population that their water-supply shall be artificially furnished from a distance, has great countervailing advantages. A given organic soakage will cease to vitiate the atmosphere by evaporation, in proportion as it gravitates to lower levels, and undergoes those chemical changes which accompany filtration through the soil. Hence it is evident that, for the healthiness of inhabited districts (where extensive soakage of organic matters is almost invariable) it becomes most important to maintain, or by artificial measures to accelerate, this down-draught through the soil; and the reader will scarcely need to be reminded, that, in those improvements of metropolitan sewerage, which it is a chief object of this Report to advocate, complete provision for the continuous drainage of soil is implied as an essential part.

an objectionable issue—or shall contain organic refuse in the active and infectious stage of its earlier transformations. Some recent cutting of a trench, or breakage of a drain in the neighbourhood, may have converted a draught, which before was chronically unwholesome, into one immediately perilous to life. Such facts ought to be known to all persons having custody of pumps within urban districts; and it ought likewise to be known that this infiltrative spoiling of springs may occur to the distance of many hundred yards.\*

In final reference to the quality of water, whether supplied by our trading companies or derived from springs within the City, I think it expedient to mention that, against its lesser impurities, great protection is given by filtration through animal charcoal, as in various 'filters and purifiers' which are before the public. These protective means do not lie within reach of the poorer classes; nor, whatever their accessibility to individuals, can any such personal arrangements render it less important to provide that water—the first necessary of life—be supplied for universal use in its utmost procurable purity.

Beyond the above points, which are of general application within the City, all your remaining precautions will relate to the condition of private houses: and of these—

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\* For a fact strikingly illustrative of this, I am indebted to my colleague, Dr. R. D. THOMSON, Lecturer on Chemistry at St. Thomas's Hospital. At Liverpool—in three wells which he examined, distant severally 760, 800, and 1050 yards from the Mersey, he found the water brackish from marine soakage, containing four or five hundred grains of solid matter *per* gallon, and totally unfit for consumption.

occupied by the poorer classes, there exist in the City some thousands over which it will be requisite, by repeated inspection, to maintain an efficient sanitary watch. From circumstances to which I have already referred, it appears that your defences against Cholera will very mainly consist in removing the causes of disease from within individual houses; and it is only by an organised system of inspection, for detecting and removing every unclean condition, that this object can be attained. For your encouragement in this task, I may venture to express my belief that, throughout a considerable portion of the City, the local affinities for Cholera are not too strong to be greatly modified and obviated by such a system.

With respect to this important work of sanitary inspection, what I now propose is no new proceeding within the City. More or less since the date of my appointment, but I hope with gradual increase of completeness and efficiency, weekly visitations on a considerable scale have been made, under my direction, by your four Inspectors of Nuisances. Acting under your authority, and guided by what information I could obtain on the existence of endemic disease\* in your several districts, I have furnished the Inspectors every week with a variable list of houses, ranging probably from fifty to one hundred and fifty at a

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\* This information has been mainly derived from two sources:—first, from the weekly Death>Returns of the nine City Registrars, which the Registrar-General most kindly allows me to have transcribed so soon as they arrive at his office;—secondly, from weekly returns which the Medical Officers of the three City Unions have had the great kindness and liberality to supply for my assistance, as to the existence of fever and kindred disorders in the several localities under their charge.



time, for their visitation and inquiry. The information which I have directed them to seek has referred of course to the various details of sanitary condition: to questions of lodgment, ventilation, cleanliness, drainage, water-supply, dust-removal, paving of yards and cellars, existence of nuisances, and the like: and I have constructed tabular forms for their use, which admit of this information being recorded and reviewed in the readiest manner. Week by week, before each meeting of your Court, I have had the habit of going through every particular of these somewhat considerable details. I have sorted out of them those very numerous cases in which your lawful powers could be usefully exerted. When I have deemed it necessary, I have myself made visits of verification or inquiry; and have finally laid before you, in the form which is familiar to your weekly meetings, such recommendations as the week's survey has shown necessary, for enforcing works of local improvement under the powers of your Acts of Parliament. I find that within the last twelve months there have been made 3147 visitations of this nature, the results of which are recorded in your office; and, founded on the result of these inspections, there have been issued 983 orders for abatement of causes of disease.

I am very far from considering that these arrangements have been perfect. Circumstances beyond my control have prevented me from constructing as complete an organisation as I could wish; and the fact that your Inspectors are very largely employed in other duties, has perhaps occasionally given some hurry and imperfection to their share of the work. Still, such as it is, this system has been the means of considerable advantage; and I am glad to be able to

claim for your Hon. Court the distinction of being first in the metropolis to have established an arrangement for the systematic sanitary visitation of the dwellings of the poor. In relation to this subject, I beg to inform your Hon. Court that your Inspectors have discharged, with much zeal, intelligence, and industry, the duties which you authorised me to impose on them.

During the last few weeks it has become obvious to your Hon. Court that the duties of this department of your service have grown to such dimensions as to necessitate some increase of your staff; and acting on this opinion, mainly with a view to render more complete your sanitary supervision of the City, you have just appointed two additional Inspectors of Nuisances. In making this appointment, you have determined not to restrict any two or three Inspectors exclusively to the business of house-inspection, but to allot the joint duties, sanitary and surveying, equally among their number: parting the area of the City into six, instead of four, Inspectors' districts; so that each Inspector shall give a certain proportion of time to the duties which he has to fulfil under your Surveyor's direction, and another certain proportion to those in which he will be engaged under the direction of your Officer of Health. It is only some experience of this arrangement that can decide whether it will be the most effectual for your purpose; but in the mean time I have studied so to dispose the industry of your increased staff, under the arrangement you have ordered, as to obtain the most systematic and efficient discharge of those duties which you have desired me to superintend.

Reckoning that each Inspector, if he fulfilled no other duty, could report on the condition of about fifty houses

*per diem*, I presume that henceforth, in each of your five more important districts, from one hundred to one hundred and twenty houses can be visited weekly by the Inspector, without encroaching on the time required for his other duties.

The general plan, on which I would propose that this force should be disposed, is the following:—first, as heretofore, the weekly list would contain all places needing investigation on the ground of such deaths and illness as are usually associated with preventable causes, in order that any sanitary defects may at once be remedied in them; secondly, in each week there would fall due a certain number of sanitary works (relating to house-drainage, water-supply, and the like) for which you would have previously issued orders requiring them to be completed within a stated time, and on the satisfactory execution of these it will be the Inspector's duty to examine and certify; thirdly, in each district I would have a certain rota of visitation, according to the badness of the spot and its known liability to fall into filthy and unwholesome condition, requiring one set of houses to be seen weekly, another set fortnightly, another monthly, another quarterly, and so on—a rota, varying from time to time with the changing circumstances of each locality; and, out of this rota, each week would supply a stated number of cases for inquiry, to which I should occasionally add certain of those establishments in which offensive occupations are pursued. Thus, in the large number of weekly visits which I suppose the Inspector to make, there would be a certain proportion of that more elaborate kind which involves an examination of the entire house; another proportion, made for the sole purpose of

seeing that previous orders have been executed; another proportion, repeated at fixed intervals, simply to ascertain that houses, once cleansed and repaired, are not relapsing into filth, nor their works becoming inefficient.

By utilising, on some such plan as this, the increased staff which you have appointed for the purpose, and by giving to its execution my continual superintendence, I trust to be able, from time to time, to certify you that the City becomes better and better capable of resisting epidemic invasion.\* From such statements as I have set before you, on the local affinities of disease—not of Cholera alone, but of typhus and its kindred, you will be prepared to expect increased sanitary advantage, from this more systematic suppression of the causes of death: and I believe you will not be disappointed. Whether the anticipated pestilence rage in our metropolis or not, you will be combating, day by day, the influence of other malignant diseases. Whenever it may be in my power to tell you generally of the City, that the dwellings of the poor are no longer crowded and stifling; nor their walls mouldy; nor their yards and cellars unpaved and sodden; nor their water-supply defective; nor their drainage stinking; nor their atmosphere hurt by neighbouring nuisances; then, gentlemen, whether Cholera test your success or not, surely you will have contributed much to conquer more habitual enemies. For whatever there may be specific and exceptional in the production of Cholera, at least it touches no healthy spot: the

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\* I may take this opportunity of mentioning that, during the last few months, the increased sanitary staff has been worked with very great advantage.—J. S., May, 1854.

local conditions which welcome its occasional presence are, in its absence, hour by hour, the workers of other death ; and in rendering a locality secure against the one, you will also have made it less vulnerable by the others.

As a last suggestion in this part of my subject, there are two steps which I would recommend to your Hon. Court, as likely to assist the labours of your officers, and to bring a large quantity of important information before you:—first (according to a plan adopted here in the last epidemic) that printed notices should be posted in every back-street, court and alley of the City, and should be renewed once a month, advising the careful maintenance of cleanliness in all houses, and inviting all persons who are aggrieved by any nuisance, or by any neglect of scavengers and dustmen, or by any defect of water-supply, forthwith to make complaint at your Office, or to the Inspector of the district, whose name and address might be subjoined; secondly, that a circular letter should be written to all persons in parochial authority, also to other clergy, to heads of visiting societies and the like, begging them to communicate with your officers on every occasion when any local uncleanliness or nuisance may come within their knowledge.

3. Finally, gentlemen—in the probable anticipation that next year Cholera will prevail in London with at least its former severity, it may be claimed of my office, that I should say something with respect to personal precautions for avoidance of the disease. While most willing to place at your disposal any useful results of my practical experience in the matter, I cannot but feel the great difficulty of making general suggestions in a form really capable of particular application.

From the eminently local prevalence of the poison, it may be inferred that, for all whose circumstances allow an option in the matter, the first and most important precaution would consist in avoiding those localities where the epidemic is active. Our knowledge of the subject enables us confidently to say that, if in one spot the chance of being attacked by Cholera is as 1 to 100, in another it becomes 1 to 50, in a third 1 to 5, in a fourth almost an equal chance whether to be attacked or not. Nothing is gained towards security by the mere act of leaving our metropolitan area, if one resorts to some other place where the system of drainage is equally vicious, or where—as at our nearest bathing-place, the beach is made almost as offensive by sewage as here the river-banks.\* From earlier statements in my Report, it will be obvious to you that the eligible sites of residence are those which stand high and dry, with clean effectual drainage of their soils and houses, conveying all organic refuse beyond range of the local atmosphere.

I will not pass this part of the subject without admitting that the course here suggested might involve a considerable desertion of particular localities, and a transient injury to their commerce. This unavoidable result of proclaiming the laws of the disease, I must regret in regard of its personal bearings. But the facts of the case are all-important for the public; and sanitary improvement will perhaps move

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\* Unless the sanitary improvement of Brighton be soon set about in earnest, the reputation for healthiness, which established its prosperity, will undergo a very sensible reverse. The natural advantages of the place are now almost neutralised by the evil adverted to in the text, and by other filthinesses of the kind.—J. S., 1854.

more quickly in the country, when it is known that the pecuniary prosperity of places may suffer from their reputation for endemic disease.

In case of Cholera prevailing with severity in spots containing a dense poor population, great assistance would be given to medical and sanitary measures, if a number of empty unlet houses, healthily situated, were at the disposal of the authorities; into which, under proper regulations, they might induce certain of the poorest families to migrate for a time, as to places of refuge, till the disease should have subsided about their original dwellings.

For persons, whose circumstances or duties retain them unavoidably in the midst of those suffering districts where the poison is most active, the best counsel I can offer—even if at first hearing it seem vague—is, that they should be vigilant as to preserving the greatest possible soundness and vigour of general health; keeping the body, so far as may be, undisturbed by extremes of heat and cold, undepressed by long confinement, unflattered by violent passions, unexhausted by physical or mental fatigue, untried by any excess or any privation; taking for diet a sufficiency of fit and nutritive food, rather in generous measure than otherwise, but far from the confines of intemperance; and giving meanwhile a prompt attention and cure to whatever accidental ailments may arise.

Such, in general language, are our best fortifications against the poison. It may be well, however, to add that in our metropolitan climate—perhaps everywhere else—the human frame tends to require some periodical aid from medicine. It may be the excitement and labour of London; it may be its atmosphere; it may be native peculiarity: but

thus the fact stands—that there are few persons who do not at intervals require the re-establishing effects of what is called *tonic* treatment. Probably three-fourths of the prescriptions we write are aimed at this mere tendency to depression in the human body, as manifested in one form or another. Now, as a man, going on some distant voyage of exploration, submits his chronometer to a last intelligent scrutiny, before he exposes it to the ordeal of other climates, so, in this matter of frequenting infected districts, men will do prudently, before they pass into perils which may test their powers of resistance, to see that they carry about with them no enfeeblement or disrepair which a short submission to medical discipline could effectually remove. For with epidemic poisons generally, and in a marked degree with Asiatic Cholera, it seems that all states of languor, depression, and debility enhance the risk of infection.\*

Beyond these general cautions, there is yet one which requires very particular mention.

In respect of the commencement and predispositions of the disease, it is now well known—first, that in this country it habitually begins with diarrhœa of a painless and apparently trivial character; secondly, that diarrhœa, however produced, is, of all known personal conditions, the one most likely to invite an attack of Cholera at times when that disease is epidemic; thirdly, that during the prevalence of

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\* For my medical readers, I may suggest that perhaps the daily use of *sulphate of quinine*, in small doses, during the height of the epidemic, would seem to deserve trial as a prophylactic; subject, of course, to what each practitioner is best able to estimate—of personal peculiarity in the patient, forbidding the use of this drug.—J. S., 1854.



Cholera, side by side with it in a district, there is always a vast amount of epidemic diarrhœa, apparently constituting slighter degrees or earlier stages of the same disease; that this condition is just as amenable to treatment as the confirmed collapse of Cholera is utterly the opposite; and—since we can never say how incurable a few hours may render this insidious symptom, that its immediate arrest is a consideration of vital importance.

Precautions against causing diarrhœa to oneself by errors of diet will vary somewhat with different individuals. Every person of ordinary discretion knows the habits of his own body, and can be tolerably confident, within certain limits of food, that he gives himself no occasion of sickness. He remembers articles of diet, which his neighbour perhaps may innocently indulge in, but which to himself are the occasion of inward disorder—of purging or vomiting, ‘bilious attack’ or nettle rash, headache, nightmare, or some other inconvenience. This knowledge fixes the limits which it primarily behoves him to regard; taking such food only into his body as experience has shown best to agree with it; and adhering to this course, without panic as to particular accustomed articles, and without abrupt discontinuance of old harmless habits. Apart from personal peculiarities, the chief dangers of diet appear to lie as follows: first, in those excesses of meat and drink, which (especially under circumstances of fatigue) occasion sickness to the stomach, or an increased labour of digestion; secondly, in taking food, solid or fluid, which is midway in some process of chemical transition—half-fermented beer and wine, water containing organic matters, meat and game and venison no longer fresh and not completely cooked, fish and shell-

fish, in any state but the most perfect freshness, fruit or vegetables long-gathered or badly kept, and the like; thirdly, in a profusion of cold sour drink; fourthly, in partaking largely of those articles of diet which habitually, or by reason of imperfect cooking, pass unchanged through the intestinal canal; and fifthly, in the indiscreet use of purgative medicines, or in taking any article of diet which is likely to produce the same effect.

In short, if care be taken under all these heads to avoid occasions of intestinal disturbance; if the diet, while generous, be simple and strictly temperate; if regular hours be given to sleep, to meals, to industry, to recreation; if a fair proportion of out-door exercise be taken; if damp and extremes of temperature be guarded against; and all practical pains be given to avoid the sources of bodily and mental depression; the danger will certainly be reduced to its *minimum*; and whatever effects the epidemic may happen to produce can be readily recognised and boldly encountered.

Should these effects arise in their customary form of diarrhœa, it is of absolute urgent necessity that immediate medical treatment be resorted to: and so important for the safety of life is the recognition of this symptom in the earliest stage of its occurrence, that no unwonted action of the bowels should pass unobserved.

The public constantly asks to be informed of some drug, or combination of drugs, to which under these circumstances they may have immediate recourse. But after very careful consideration of this subject, after hearing arguments on both sides, and reading those prescriptions which have been recommended for adoption, I venture to express

my opinion that the safest course for the public, in regard of this threatened disease, will be to follow the same principle as guides them in their ordinary seizures of illness, and to obtain as quickly as possible the aid of their customary medical advisers. There is an invincible aptitude in the public to misapply all precautionary medicines within their reach; often superstitiously to treat them as charms, under the protection of which they may neglect temperance of diet and all other solicitude for health; often ignorantly to employ them in cases for which their use is forbidden; often, at the instigation of panic, to abuse them by preposterous and hurtful excess. Nervous and uneducated persons, instead of employing their astringent dose simply to stop any undue action from the bowels, would be apt, as the danger neared them, to make it an habitual dram in order to anticipate any such action; and the frequent after-necessity for purgative medicine, thus created, would constitute the very danger they desire to avoid. Recognising, therefore, at its full value, the importance of immediately treating, in every case, the first phenomena of epidemic diarrhœa, I must yet doubt whether the conditions of medical science and general education are such as to justify the promulgation of general formulæ so liable to extensive abuse.

I speak of course with particular reference to the metropolis. In remote rural districts it may often be desirable that discreet and intelligent persons—the Clergy, for instance, should obtain from their medical neighbours some astringent preparation to which—in the very rare event of real emergency, temporary recourse might be had: but—for so hazardous a condition of disease, I must repeat as a

general rule, that no nostrum, even in the best-intentioned hands of ignorance, can supply the place of medical discrimination.

During the acute prevalence of the epidemic in any particular locality, it becomes of great importance to bring the uneducated classes of society, as far as possible, under systematic medical care; in the absence of which they are likely to neglect all premonitions of the disease, and thus to incur much unnecessary danger. To fulfil this object as regards the poor, express provision has been made by the Law: and it might be well for other classes, under similar exposure to attack, to consider how far they could arrange for their households a similar plan of protection.

Under any Order in Council which brings into action the extraordinary powers of the Nuisances Removal Act, the General Board of Health has authority to enjoin on all Boards of Guardians throughout the country, that they provide, for 'persons afflicted by or threatened with' the disease, such medical aid as may be required: and the actual working of this has been that, on all occasions of epidemic Cholera prevailing in particular localities, the General Board of Health has called on the local Boards of Guardians to establish systematic house-to-house visitation, for discovering and treating among the poor all premonitory symptoms of the disease.

In the too probable event of its becoming necessary next year to establish this system of medical organisation in parts of the metropolis, I have no reason to doubt that a requisition to the above effect will be addressed to the Guardians of the City poor; and, in this anticipation, I think it desirable to bring, in conclusion, one more

point under notice of your Hon. Court. During the former invasion, the Guardians within the City of London resisted the requisitions of the General Board of Health; and the first fourteen weeks of the epidemic consequently passed without the establishment of any visitational system for arresting its progress. In the fifteenth week, however, the Corporation of the City undertook the unperformed duty, not legally devolving on them, and requested me to make arrangements for the purpose of its execution. With the assistance of the several Medical Officers of the City Unions, I immediately organised the requisite staff, and from that moment to the close of the epidemic there continued under my superintendence a systematic visitation of the poor, with beneficial, though tardy and imperfect, results.

Recalling these incidents to the recollection of your Hon. Court, I would beg to observe that no similar endeavour can fully succeed, except as a system—well considered beforehand, and adjusted to the various circumstances which may require its application. Uncertainties of responsibility and conflicts of jurisdiction would inevitably occasion a sacrifice of life; and therefore, before the time when Cholera is likely to become epidemic, it should be definitively settled who is to undertake this organisation. Your Commission can have no jurisdiction in the matter; and the interference of the Corporation would be only at its own option. The legal responsibility rests solely with the Boards of Guardians: and it seems to me indispensable that, before the time for action arrives, the Corporation should determine its intentions; in order that the Boards of Guardians, if again called upon to organise arrangements

of the kind in question, may know distinctly—either that the Corporation has relieved them of their task, or that there rests on them the undivided obligation of providing for the crisis.

III. Gentlemen, in concluding this report, I will not attempt to disguise from you that it has been written under feelings of considerable apprehension; and I am fully conscious that, in thus expressing myself, I am liable to the imputation of raising unnecessary alarm.

If the possible mischief to be wrought by epidemic Cholera lay in some fixed inflexible fate, whatever opinion or knowledge I might hold on the subject of its return, silence would be better than speech; and I could gladly refrain from vexing the public ear by gloomy forebodings of an inevitable future.

But from this supposition the case differs diametrically: and the people of England are not like timid cattle, capable, only when blindfold, of confronting danger. It belongs to their race—it belongs to their dignity of manhood, to take deliberate cognisance of their foes, and not lightly to cede the victory. A people that has fought the greatest battles—not of arms alone, but of genius and skilful toil, is little likely to be scared at the necessity of meeting large danger by appropriate devices of science. A people that has inaugurated railways—that has spanned the Menai Strait and reared the Crystal Palace, can hardly fear the enterprise of draining poison from its infected towns. A people that has freed its foreign slaves at twenty millions' ransom, will never let its home population perish, for cheapness sake, in the ignominious ferment of their filth.

Therefore, gentlemen, advisedly I state the danger as it seems to me. England has again become subject to a plague, the recurrence of which—or the duration—or the malignity, no human being can predict.

But, if I state the danger, so likewise, to the best of my belief, I state the remedy and defence. Colossal statistics concur with the results of detailed inspection, to refer this disease, in common with many others that scourge our population, distinctly and infallibly, to the working of local causes—of causes susceptible of removal—of causes which it devolves on our Legislature to remove.

The exemption we seek is worth a heavy purchase. My thoughts turn involuntarily to the epidemics of former centuries, to their frequent returns and immense fatality. I reflect on the Plague, and how it influenced the average death-rate of London; how in 1593 it doubled it, in 1603 trebled it, in 1625 quadrupled it: and how (after a less considerable visitation in 1636) it actually multiplied the mortality sevenfold in the tremendous epidemic of '65. The ravages of that pestilence are best appreciated in the fact, that we esteem the Great Fire of London a cheap equivalent for their arrest; looking to that eventful conflagration of the metropolis with gratitude, rather than horror, because of the mightier evils that were extinguished with its flames.

To so frightful a development as this, Cholera, by many degrees, has not attained; but, ignorant as we are of its laws and resources, we dare not surmise, at any renewed invasion, what increment of severity it may have won. In the simple fact, that our country has again become subject to pestilential epidemics, there lies an amount of threat only to be measured by those who are conversant, by

history or experience, with the possible developments of such disease.

Therefore, gentlemen, having the deepest assurance that these unexplored possibilities of evil may be foreclosed by appropriate means, I should ill deserve your confidence if I shrank from setting before you—however ungracious the task—my deliberate estimate of the peril.

It pertains to my local office to tell you of local cures; and this I have sought to do. I have suggested that, by active superintendence of all houses within your jurisdiction, there may be suppressed in detail those several causes of the disease which arise in individual neglect; that, by elaborate care as to the cleanliness of pavements, markets, docks, and sewers, something may be done towards the mitigation of more general causes; that, by a well-organised system of medical visitation, very much may be effected towards encountering attacks of the disease, while still amenable to treatment:—that these, with similar precautions, are therefore to be recommended.

And not for a moment would I seem to depreciate such measures, palliative only, and partial though they be. By their judicious application, from Aldgate to the Temple, life may possibly be saved to some hundreds; to children that are fondly loved, to parents that are the stay of numbers.

But against the full significance of any epidemic, I am bound to tell you that these are but poor substitutes for protection. To render them effectual, even in their narrow sphere of operation, there must be great vigilance and great expenditure; a weary vigilance and a disproportionate expenditure, because chiefly given to defeat in detail what



should have been prevented in principle. And be done what may, in this palliative spirit, the sources of the disease are substantially unstayed: for the faults, to which its metropolitan prevalence is due, consist not simply in a number of individual mismanagements, but include a common and radical mal-construction as their chief.

No city, so far as Science may be trusted, can deserve immunity from epidemic disease, except by making absolute cleanliness the first law of its existence; such cleanliness, I mean, as consists in the perfect adaptation of drainage, water-supply, scavenging, and ventilation, to the purposes they should respectively fulfil; such cleanliness, as consists in carrying away by these means, inoffensively, all refuse materials of life—gaseous, solid, or fluid, from the person, the house, the factory, or the thoroughfare, so soon as possible after their formation, and with as near an approach, as their several natures allow, to one continuous current of removal.

To realise for London this conception of how a city should cleanse itself may involve, no doubt, the perfection of numberless details. Yet, most of all, it would presuppose a comprehensive organisation of plan and method: not alone for that intramural unity of system which is needful for all the works, as most for those of drainage and water-supply; but, equally, to harmonise these works with other extramural arrangements for utilising to the country the boundless wealth of metropolitan refuse—for distributing to the uses of agriculture what is then rescued from the character of filth—for requiring to the fields in gifts for vegetation, what they have rendered to the town in food for man.

How far the construction of London has proceeded on the recognition of such objects, or how far the advantages of such a plan have been realised, it could only be a mockery to ask. Our metropolis, by successive accretions, has covered mile after mile of land. Each new addition has been made with scarcely more reference to the legitimate necessities of life, than if it had clustered there by crystallisation. With no scientific forecast to plan the whole, with little but chance and cheapness to shape the parts, our desultory architecture has eclipsed the conditions of health. Draining up-hill or down-hill, as the case might be, and running their aqueducts at random from chalk-quarries or river-mud; or ponding sewage in their cellars, and digging beside it for water; blocking-up the inlets of freshness and, equally, the outlets of nuisance; constructing sewers to struggle with the Thames—now to pollute its ebb, now to be obstructed by its flow; the builders of many generations have accumulated sanitary errors in so intricate a system, that their apprehension and their cure seem equally remote.

Therefore—by reason of causes, ramified through the whole metropolis and deep-rooted in its soil, which bind all parts together in one common endurance of their effects—therefore cannot epidemic disease be conquered by any exertions or by any amelioration, short of the complete and comprehensive cure. Against the danger we dread, no shelter is to be found in petty reforms and patchwork legislation. Not to inspectorships of nuisances, but to the large mind of State-Policy, one must look for a real emancipation from this threatening plague.

A child's intellect can appreciate the wild absurdity of seeking at Peru what here runs to waste beneath our pave-

ments,—of ripening only epidemic disease with what might augment the food of the people—of waiting, like our ancestors, to expiate the neglected divinity of water in some bitter purgation by fire.

But it needs the grasp of political mastership, not uninformed by Science, to convert to practical application these obvious elements of knowledge; to recognise a national object irrelevant to the interests of party; to lift an universal requirement from the sphere of professional jealousies, and to found in immutable principles the sanitary legislation of a people.

I have the honour to remain,

&c. &c.

## APPENDIX OF TABLES

ILLUSTRATING THE

## SANITARY CONDITION OF THE CITY OF LONDON.

- I. Area and Population of the several Districts and Sub-districts of the City.
- II. Quinquennial Synopsis of City Mortality, from Michaelmas 1848 to Michaelmas 1853; with Death-Rates calculated for this period, on the Population enumerated in 1851, for each District and Sub-District of the City.
- III. First annual enumeration of Deaths, relating to the fifty-two weeks dating from October 1st, 1848, to September 29th, 1849.
- IV. Second annual enumeration of Deaths, relating to the fifty-two weeks, dating from September 30th, 1849, to September 28th, 1850.
- V. Third annual enumeration of Deaths, relating to the fifty-two weeks, dating from September 29th, 1850, to September 27th, 1851.
- VI. Fourth annual enumeration of Deaths, relating to the fifty-two weeks, dating from September 28th, 1851, to September 25th, 1852.
- VII. Fifth annual enumeration of Deaths, relating to the fifty-two weeks, dating from September 26th, 1852, to September 24th, 1853.
- VIII. Quinquennial Mortality, classified by Age; first, for the entire City; next, for the Three Unions severally.
- IX. Number of Deaths occasioned, during the last five years, by certain Acute Diseases, chiefly epidemic, infectious, and endemic.
- X. Comparative Mortality in different seasons of the year: namely, in the Autumn-Quarters (October, November, December), in the Winter-Quarters (January, February, March), in the Spring-Quarters (April, May, June), and in the Summer-Quarters (July, August, September), of the five years from Michaelmas 1848 to Michaelmas 1853.
- XI. Autumn Mortality.
- XII. Winter Mortality.
- XIII. Spring Mortality.
- XIV. Summer Mortality.

No. I. *Area and Population of the several Districts and Sub-districts of the City of London.*

| Sub-district.                                     |                       | Census of 1841. | Census of 1851. | Decennial increase (+) or decrease. (—) | Area of Land in Acres. |
|---|-----------------------|-----------------|-----------------|---|------------------------|
| EAST LONDON.                                      | St. Botolph . . . . . | 20,197          | 23,435          | + 3238                                  | 85                     |
|   | Cripplegate . . . . . | 19,161          | 20,582          | + 1421                                  | 68                     |
|   | Workhouses* . . . . . | 454             | 576             | + 122                                   |                        |
|   | Total . . . . .       | 39,812          | 44,593          | + 4781                                  | 153                    |
| WEST LONDON.                                      | North . . . . .       | 12,138          | 12,350          | + 212                                   | 47                     |
|   | South . . . . .       | 16,460          | 15,844          | — 616                                   | 77                     |
|   | Workhouse† . . . . .  | 387             | 409             | + 22                                    |                        |
|   | Total . . . . .       | 28,985          | 28,603          | — 382                                   | 124                    |
| CITY OF LONDON.                                   | South-West . . . . .  | 8839            | 9204            | + 365                                   | 49                     |
|   | North-West . . . . .  | 12,427          | 11,847          | — 580                                   | 72                     |
|   | South . . . . .       | 11,954          | 11,461          | — 493                                   | 82                     |
|   | South-East . . . . .  | 10,597          | 10,594          | — 3                                     | 84                     |
|   | North-East . . . . .  | 12,103          | 12,826          | + 723                                   | 92                     |
|   | Workhouse‡ . . . . .  | 920             | 794             | — 126                                   |                        |
| Total . . . . .                                   | 56,840                | 56,726          | — 114           | 379                                     |                        |
| Entire Population of the City of London . . . . . |                       | 125,637         | 129,922         | + 4285                                  | 656                    |

\* One of these workhouses is situated in the North sub-district of the West London Union. In 1841 it contained 157 inmates ; in 1851, 187 inmates. The other workhouse is situated in the St. Botolph sub-district : in 1841 it contained 297, in 1851, 389 persons.

† This workhouse is situated in the North sub-district of the Union.

‡ In 1841, the 920 paupers of this Union were received, partly at Marlborough House, Peckham ; partly in Deacon's Farm-house, Stepney Green. The present workhouse, erected since 1841, is at Bow.

No. II.—*Quinquennial Synopsis of City Mortality, with Death-rates calculated per Thousand on the Population of 1851.*

| Population according to the Census of 1851.<br>{ Entire City of London, 129,922. | EAST LONDON UNION,<br>44,598. |                          |                      | WEST LONDON UNION,<br>28,603. |                   |                     | CITY OF LONDON UNION,<br>56,726. |                  |                   |                  |                  |                     |
|--|-------------------------------|--------------------------|----------------------|-------------------------------|-------------------|---------------------|----------------------------------|------------------|-------------------|------------------|------------------|---------------------|
|  | Saint Botolph,<br>23,435.     | Cripple-gate,<br>20,582. | Work-houses,<br>576. | North,<br>12,350.             | South,<br>15,844. | Work-house,<br>409. | S. W.<br>9,204.                  | N. W.<br>11,847. | South,<br>11,461. | S. E.<br>10,594. | N. E.<br>12,826. | Work-house,<br>794. |
| 1848-9 ..... <b>3763</b>   | 519                           | 574                      | 179                  | 372                           | 598               | 126                 | 293                              | 245              | 263               | 214              | 262              | 103                 |
| 1849-50..... <b>2752</b>   | 296                           | 444                      | 125                  | 324                           | 290               | 108                 | 176                              | 168              | 218               | 183              | 219              | 101                 |
| 1850-1 ..... <b>2978</b>   | 493                           | 471                      | 167                  | 317                           | 313               | 68                  | 191                              | 169              | 258               | 217              | 213              | 101                 |
| 1851-2 ..... <b>3064</b>   | 534                           | 460                      | 176                  | 266                           | 379               | 129                 | 196                              | 198              | 203               | 171              | 235              | 117                 |
| 1852-3 ..... <b>3040</b>   | 516                           | 534                      | 155                  | 289                           | 309               | 164                 | 170                              | 188              | 223               | 164              | 224              | 104                 |
| —<br>***   | 2458                          | 2483                     | 802                  | 1568                          | 1889              | 595                 | 1026                             | 968              | 1165              | 949              | 1153             | 526                 |
| Total ... <b>15,597</b>  | <b>5743</b>                   |                          |                      | <b>4052</b>                   |                   |                     | <b>5787</b>                      |                  |                   |                  |                  |                     |
| Yearly Death-rate per thousand of the living Population. <b>24.00</b>            | <b>25.75</b>                  |                          |                      | <b>28.33</b>                  |                   |                     | <b>20.40</b>                     |                  |                   |                  |                  |                     |
|  | <b>24.30</b>                  | <b>27.41</b>             | *                    | <b>29.19</b>                  | <b>27.66</b>      | *                   | <b>23.83</b>                     | <b>17.96</b>     | <b>21.90</b>      | <b>19.52</b>     | <b>19.58</b>     | *                   |

N.B. The first year's total (3763) includes 15 deaths, which, by reason of their imperfect registration, it has been impossible to refer correctly to the Unions where they occurred.

## NOTE TO TABLE No. II.

IN calculating the Death-Rates given in the last lines of this Table, I have proceeded as follows:—

First, I have counted all *Workhouse-Population* and *Workhouse-Deaths* as forming part of the aggregate population and aggregate mortality of that Union to which the particular workhouse legally belongs.

Next, I have distributed among the several sub-districts the population and the mortality of their Union Workhouses, in the ratio of the general sub-district population; so as to prevent the high Workhouse-Mortality from telling unjustly against that sub-district in which the Workhouse happens to have been erected.

Thus, for instance, the East London Union has its male Workhouse placed in the territory of the West London Union; but I have reckoned it as belonging to the East London Union, in respect both of its population and its deaths. Similarly, the City of London Union has its Workhouse situate at Bow; but, not the less, I have considered its 794 inmates and 526 deaths as belonging to the population and the mortality of our central Union.

Thus again for the sub-district death-rates—for instance, in the two sub-districts of the East London Union: reckoning the Workhouse-Population not as exclusively due either to Cripplegate or to St. Botolph, but as furnished by these sub-districts jointly, in the ratio of their populations, I have distributed 576 between them in the proportion, 23,435 : 20,582. The Workhouse-Deaths of the period (802) have been similarly distributed; and the rates, given in the last line of the table, are finally deduced from a comparison of these sums, viz:—

$23,435 + 306.66 : 2458 + 426.991 :: 1000 : 121.515$ , which divided by 5 (to show an annual, instead of a quinquennial, result) gives 24.30 as the annual death-rate for St. Botolph; and, in like manner,  $20,582 + 269.33 : 2483 + 375.008$  gives 137.065 as the quinquennial, and 27.41 as the annual death-rate *per* thousand for the sub-district of Cripplegate.

*Hospital Deaths* have been distributed, as far as possible, according to the previous residence of the patients. Thus the north sub-district of the West London Union, in which St. Bartholomew's Hospital is situated, is made to retain only its just proportion of deaths. On the same principle I have reckoned to the death-lists of other sub-districts those cases in which I could ascertain that the residents of such sub-districts had gone to die either in St. Bartholomew's, or in other Metropolitan Hospitals.





No. IV.—Second Annual Enumeration of Deaths, relating to the Fifty-two Weeks dating from September 30th, 1849, to September 28th, 1850.

|   | EAST LONDON UNION.                |                    |                   |      | WEST LONDON UNION. |                   |                   |  | CITY OF LONDON UNION. |                   |                   |                   |                   |                   |
|---|-----------------------------------|--------------------|-------------------|------|--------------------|-------------------|-------------------|--|-----------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
|   | Saint Botolph.                    | Cripple-gate.      | Work-houses.      |      | North.             | South.            | Work-house.       |  | S. W.                 | N. W.             | South.            | S. E.             | N. E.             | Work-house.       |
| I. In the four quarterly periods, terminating as follows :— |                                   |                    |                   |      |                    |                   |                   |  |                       |                   |                   |                   |                   |                   |
| I. In the quarter ending Dec. 29th . . .                    | M. F. 62 56<br>118                | M. F. 72 65<br>137 | M. F. 22 22<br>44 | 765  | M. F. 42 43<br>85  | M. F. 30 40<br>70 | M. F. 10 13<br>23 |  | M. F. 35 22<br>57     | M. F. 26 19<br>45 | M. F. 27 28<br>55 | M. F. 30 21<br>51 | M. F. 22 30<br>52 | M. F. 9 19<br>28  |
| II. In the quarter ending March 30th . . .                  | M. F. 49 47<br>96                 | M. F. 68 56<br>124 | M. F. 21 15<br>36 | 803  | M. F. 50 41<br>91  | M. F. 42 42<br>84 | M. F. 21 19<br>40 |  | M. F. 23 23<br>46     | M. F. 16 29<br>45 | M. F. 48 32<br>80 | M. F. 22 36<br>58 | M. F. 45 29<br>74 | M. F. 15 14<br>29 |
| III. In the quarter ending June 29th . . .                  | M. F. 39 41<br>80                 | M. F. 42 48<br>90  | M. F. 6 13<br>19  | 589  | M. F. 39 35<br>74  | M. F. 45 26<br>71 | M. F. 5 22<br>27  |  | M. F. 13 21<br>34     | M. F. 14 25<br>39 | M. F. 25 15<br>40 | M. F. 23 20<br>43 | M. F. 21 29<br>50 | M. F. 9 13<br>22  |
| IV. In the quarter ending Sept. 28th . . .                  | M. F. 57 45<br>102                | M. F. 57 36<br>93  | M. F. 12 14<br>26 | 595  | M. F. 35 39<br>74  | M. F. 26 39<br>65 | M. F. 5 13<br>18  |  | M. F. 20 19<br>39     | M. F. 18 21<br>39 | M. F. 22 21<br>43 | M. F. 16 15<br>31 | M. F. 15 28<br>43 | M. F. 12 10<br>22 |
| Sum of the four quarters                                    | 207 189<br>396                    | 239 205<br>444     | 61 64<br>125      | 2752 | 166 158<br>324     | 143 147<br>290    | 41 67<br>108      |  | 91 85<br>176          | 74 94<br>168      | 122 96<br>218     | 91 92<br>183      | 103 116<br>219    | 45 56<br>101      |
|   | 965                               |                    |                   |      | 722                |                   |                   |  | 1065                  |                   |                   |                   |                   |                   |
|   | TOTAL FOR THE YEAR . . . . . 2752 |                    |                   |      |                    |                   |                   |  |                       |                   |                   |                   |                   |                   |



No. VI.—Fourth Annual Enumeration of Deaths, relating to the Fifty-two Weeks dating from September 28th, 1851, to September 25th, 1852.

| DEATHS in the four quarterly periods, terminating as follows:— | EAST LONDON UNION. |       |               |       | WEST LONDON UNION. |       |             |       | CITY OF LONDON UNION. |       |       |       |        |       |       |       |       |       |             |       |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |
|--|--------------------|-------|---------------|-------|--------------------|-------|-------------|-------|-----------------------|-------|-------|-------|--------|-------|-------|-------|-------|-------|-------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|
|  | Saint Botolph      |       | Cripple-gate. |       | Work-house.        |       | Work-house. |       | S. W.                 |       | N. W. |       | South. |       | S. E. |       | N. E. |       | Work-house. |       |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |
|  | M. F.              | M. F. | M. F.         | M. F. | M. F.              | M. F. | M. F.       | M. F. | M. F.                 | M. F. | M. F. | M. F. | M. F.  | M. F. | M. F. | M. F. | M. F. | M. F. | M. F.       | M. F. |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |
| I. In the quarter ending Dec. 27th. . . . .                    | 73                 | 67    | 59            | 58    | 117                | 64    | 140         | 68    | 80                    | 37    | 43    | 18    | 12     | 30    | 24    | 28    | 40    | 28    | 40          | 28    | 33  | 28  | 26  | 26  | 23  | 25  | 48  | 55  | 29  | 29  | 9   | 20  |     |     |    |
| Sum of the four quarters                                       | 266                | 268   | 241           | 219   | 77                 | 99    | 534         | 460   | 176                   | 144   | 122   | 201   | 178    | 83    | 46    | 144   | 122   | 201   | 178         | 83    | 46  | 103 | 93  | 106 | 92  | 110 | 93  | 99  | 72  | 123 | 112 | 55  | 62  |     |    |
|  | 1170               |       |               |       | 774                |       |             |       | 1120                  |       |       |       | 3064   |       |       |       |       |       |             |       |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |
| II. In the quarter ending March 27th. . . . .                  | 54                 | 56    | 78            | 53    | 21                 | 17    | 110         | 131   | 38                    | 39    | 31    | 65    | 56     | 23    | 9     | 47    | 51    | 41    | 47          | 24    | 33  | 29  | 22  | 19  | 30  | 17  | 33  | 26  | 17  | 11  | 32  | 28  | 17  | 15  |    |
| III. In the quarter ending June 26th. . . . .                  | 77                 | 83    | 54            | 62    | 6                  | 20    | 160         | 116   | 26                    | 35    | 39    | 41    | 36     | 17    | 14    | 74    | 77    | 31    | 31          | 26    | 18  | 15  | 17  | 29  | 20  | 15  | 11  | 31  | 23  | 12  | 16  | 28  | 28  | 12  | 16 |
| IV. In the quarter ending Sept. 27th. . . . .                  | 160                | 116   | 116           | 26    | 77                 | 31    | 266         | 379   | 129                   | 74    | 77    | 74    | 77     | 31    | 31    | 266   | 379   | 129   | 129         | 196   | 198 | 198 | 203 | 203 | 171 | 171 | 235 | 235 | 117 | 117 | 117 | 117 | 117 | 117 |    |
| Sum of the four quarters                                       | 266                | 268   | 241           | 219   | 77                 | 99    | 534         | 460   | 176                   | 144   | 122   | 201   | 178    | 83    | 46    | 144   | 122   | 201   | 178         | 83    | 46  | 103 | 93  | 106 | 92  | 110 | 93  | 99  | 72  | 123 | 112 | 55  | 62  |     |    |
|  | 1170               |       |               |       | 774                |       |             |       | 1120                  |       |       |       | 3064   |       |       |       |       |       |             |       |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |
| Sum of the four quarters                                       | 1170               |       |               |       | 774                |       |             |       | 1120                  |       |       |       | 3064   |       |       |       |       |       |             |       |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |
| TOTAL FOR THE YEAR . . . . .                                   | 3064               |       |               |       |                    |       |             |       |                       |       |       |       |        |       |       |       |       |       |             |       |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |

No. VII.—*Fifth Annual Enumeration of Deaths, relating to the Fifty-two Weeks dating from September 26th, 1852, to September 24th, 1853.*

| DEATHS in the four quarterly periods, terminating as follows:— | EAST LONDON UNION. |       |               |       | WEST LONDON UNION. |       |        |       | CITY OF LONDON UNION. |       |       |       |        |       |       |       |       |       |             |       |     |     |     |    |
|--|--------------------|-------|---------------|-------|--------------------|-------|--------|-------|-----------------------|-------|-------|-------|--------|-------|-------|-------|-------|-------|-------------|-------|-----|-----|-----|----|
|  | Saint Botolph.     |       | Cripple-gate. |       | North.             |       | South. |       | Work-house.           |       | N. W. |       | South. |       | S. E. |       | N. E. |       | Work-house. |       |     |     |     |    |
|  | M. F.              | M. F. | M. F.         | M. F. | M. F.              | M. F. | M. F.  | M. F. | M. F.                 | M. F. | M. F. | M. F. | M. F.  | M. F. | M. F. | M. F. | M. F. | M. F. | M. F.       | M. F. |     |     |     |    |
| I. In the quarter ending Dec. 25th. . . . .                    | 72                 | 58    | 46            | 60    | 106                | 30    | 68     | 67    | 33                    | 37    | 43    | 57    | 33     | 31    | 26    | 18    | 15    | 25    | 29          | 10    | 7   |     |     |    |
|  | 130                |       |               |       |                    |       |        |       |                       |       |       |       |        |       |       |       |       |       |             |       | 17  |     |     |    |
| II. In the quarter ending March 26th. . . . .                  | 67                 | 64    | 80            | 66    | 32                 | 22    | 35     | 31    | 45                    | 55    | 34    | 20    | 35     | 32    | 33    | 29    | 20    | 40    | 35          | 15    | 17  |     |     |    |
|  | 131                |       | 146           |       | 54                 |       | 66     | 100   | 54                    | 49    | 57    | 65    | 49     |       |       |       |       | 75    |             |       | 32  |     |     |    |
| III. In the quarter ending June 25th. . . . .                  | 69                 | 60    | 69            | 62    | 24                 | 27    | 53     | 36    | 46                    | 44    | 25    | 21    | 89     | 90    | 27    | 20    | 24    | 26    | 27          | 20    | 19  | 14  |     |    |
|  | 129                |       | 131           |       | 51                 |       | 89     |       | 46                    |       | 45    |       | 47     | 59    | 47    | 50    |       |       | 47          |       | 33  |     |     |    |
| IV. In the quarter ending Sept. 24th. . . . .                  | 70                 | 56    | 84            | 67    | 8                  | 12    | 82     | 34    | 25                    | 27    | 18    | 13    | 66     | 52    | 18    | 23    | 18    | 14    | 28          | 20    | 10  | 12  |     |    |
|  | 126                |       | 151           |       | 20                 |       | 66     |       | 31                    |       | 39    |       | 41     | 42    | 32    | 32    |       |       | 48          |       | 22  |     |     |    |
| Sum of the four quarters                                       | 278                | 238   | 279           | 255   | 74                 | 81    | 155    | 134   | 151                   | 158   | 91    | 73    | 289    | 309   | 104   | 84    | 118   | 105   | 89          | 75    | 120 | 104 | 54  | 50 |
|  | 516                |       | 534           |       | 155                |       |        |       | 164                   |       | 170   |       | 188    | 223   | 164   | 164   |       |       | 224         |       | 224 |     | 104 |    |
|  | 1205               |       |               |       | 762                |       |        |       | 1073                  |       |       |       |        |       |       |       |       |       |             |       |     |     |     |    |

TOTAL FOR THE YEAR. . . . . 3040

No. VIII.—*Quinquennial Mortality, classified by Age, first for the entire City, next for the three Unions severally.*

| Deaths in the Population of the City of London. | Under 5 Years of Age. | From 5 to 10. | From 10 to 15. | From 15 to 20. | From 20 to 30. | From 30 to 40. | From 40 to 50. | From 50 to 60. | From 60 to 70. | From 70 upwards. | Age not reported. | Total. |
|---|-----------------------|---------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|------------------|-------------------|--------|
| 1848—49 . . . . .                               | 1243                  | 92            | 90             | 292            | 345            | 396            | 355            | 366            | 367            | 15               | 3763              |        |
| 1849—50 . . . . .                               | 1032                  | 44            | 70             | 166            | 200            | 251            | 254            | 318            | 334            | 0                | 2752              |        |
| 1850—51 . . . . .                               | 1194                  | 48            | 60             | 169            | 227            | 248            | 261            | 303            | 342            | 2                | 2978              |        |
| 1851—52 . . . . .                               | 1197                  | 57            | 84             | 196            | 253            | 267            | 260            | 287            | 350            | 0                | 3064              |        |
| 1852—53 . . . . .                               | 1135                  | 37            | 59             | 179            | 258            | 268            | 297            | 320            | 393            | 0                | 3040              |        |
| <b>Sum of five years' deaths . . . . .</b>      | <b>5801</b>           | <b>278</b>    | <b>363</b>     | <b>1002</b>    | <b>1283</b>    | <b>1430</b>    | <b>1427</b>    | <b>1594</b>    | <b>1786</b>    | <b>17</b>        | <b>15597</b>      |        |
| East London Union . . . . .                     | 2471                  | 80            | 105            | 338            | 432            | 488            | 444            | 551            | 619            | 0                | 5743              |        |
| West London Union . . . . .                     | 1416                  | 75            | 122            | 305            | 376            | 405            | 393            | 420            | 398            | 1                | 4052              |        |
| City of London Union . . . . .                  | 1914                  | 260           | 136            | 359            | 475            | 537            | 590            | 623            | 769            | 1                | 5787              |        |
| Uncertain Address . . . . .                     | *                     | *             | *              | *              | *              | *              | *              | *              | *              | *                | 15                | 15     |

No. IX.—*Number of Deaths occasioned, during the last Five Years, by certain Acute Diseases, chiefly Epidemic, Infectious, and Endemic.*

| In the successive years terminating severally as follows :— | Fever.     | Acute Diarrhoea (not of infants) Dysentery, and Cholera. | Scarlet-Fever and Cynanche maligna. | Small-Pox. | Erysipelas, Pyæmia, and Puerperal Fever. | Diarrhoea, Bronchitis and Pneumonia of Infants under 3 years of age. | Measles, Hooping-cough and Croup. | Hydrocephalus and Convulsions of Infancy. | Total of preceding columns. |
|---|------------|--|-------------------------------------|------------|--|--|-----------------------------------|---|-----------------------------|
| At Michaelmas, 1849.....                                    | 166        | 825  | 135                                 | 17         | 44                                       | 285  | 196                               | 264                                       | <b>1932</b>                 |
| “ “ 1850.....   | 118        | 54   | 32                                  | 33         | 40                                       | 243  | 124                               | 219                                       | <b>863</b>                  |
| “ “ 1851.....   | 107        | 23   | 46                                  | 41         | 17                                       | 340  | 272                               | 282                                       | <b>1128</b>                 |
| “ “ 1852.....   | 165        | 37   | 86                                  | 96         | 24                                       | 330  | 132                               | 308                                       | <b>1178</b>                 |
| “ “ 1853.....   | 145        | 43   | 85                                  | 15         | 26                                       | 304  | 190                               | 289                                       | <b>1097</b>                 |
| Total number of such Deaths in the Five Years 1848–53.      | <b>701</b> | <b>982</b>   | <b>384</b>                          | <b>202</b> | <b>151</b>                               | <b>1502</b>  | <b>914</b>                        | <b>1362</b>                               | <b>6198</b>                 |

No. X.—Comparative Mortality in different seasons of the Year; namely, in the Autumn Quarters (Oct., Nov., Dec.) in the Winter Quarters (Jan., Feb., March,) in the Spring Quarters (April, May, June) and in the Summer Quarters (July, Aug., Sept.) of the Five Years from Michaelmas, 1848, to Michaelmas, 1853.

SYNOPSIS.

| DEATHS in the different seasons of five years, as follows:— | EAST LONDON UNION. |               |              |             | WEST LONDON UNION. |             |             |       | CITY OF LONDON UNION. |       |       |             |             |  | Total for entire City. |
|---|--------------------|---------------|--------------|-------------|--------------------|-------------|-------------|-------|-----------------------|-------|-------|-------------|-------------|--|------------------------|
|   | Saint Botolph      | Cripple-gate. | Work-houses. | North.      | South.             | Work-house. | S. W.       | N. W. | South.                | S. E. | N. E. | Work-house. |             |  |                        |
|   | 616                | 613           | 201          |             |                    |             |             |       |                       |       |       |             |             |  |                        |
| In five Autumn Quarters . . .                               | <b>1430</b>        |               |              | 357         | 392                | 129         | 245         | 236   | 272                   | 227   | 271   | 119         | <b>3678</b> |  |                        |
| In five Winter Quarters . . .                               | <b>1487</b>        |               |              | 371         | 464                | 183         | 248         | 274   | 347                   | 265   | 360   | 153         | <b>4152</b> |  |                        |
| In five Spring Quarters . . .                               | <b>1297</b>        |               |              | 402         | 471                | 159         | 226         | 230   | 273                   | 255   | 262   | 137         | <b>3712</b> |  |                        |
| In five Summer Quarters . . .                               | <b>1529</b>        |               |              | 438         | 562                | 124         | 307         | 228   | 273                   | 202   | 260   | 117         | <b>4040</b> |  |                        |
|   |                    |               |              | <b>1124</b> |                    |             | <b>1387</b> |       |                       |       |       |             |             |  |                        |

## No. XI.—Comparative Mortality in Different Seasons of the Year.

## AUTUMN QUARTERS.

| DEATHS in five Autumn Quarters as follows :— | EAST LONDON UNION. |               |              | WEST LONDON UNION. |            |             | CITY OF LONDON UNION. |            |            |            |            |             | Totals for entire City. |
|--|--------------------|---------------|--------------|--------------------|------------|-------------|-----------------------|------------|------------|------------|------------|-------------|-------------------------|
|  | Saint Botolph.     | Cripple-gate. | Work-houses. | North.             | South.     | Work-house. | S.W.                  | N.W.       | South.     | S.E.       | N.E.       | Work-house. |                         |
|  |                    |               |              |                    |            |             |                       |            |            |            |            |             |                         |
| Oct., Nov., Dec., 1848..                     | 127                | 128           | 31           | 74                 | 103        | 29          | 40                    | 50         | 59         | 40         | 62         | 23          | <b>766</b>              |
| “ “ “ 1849..                                 | 118                | 137           | 44           | 85                 | 70         | 23          | 57                    | 45         | 55         | 51         | 52         | 28          | <b>765</b>              |
| “ “ “ 1850..                                 | 101                | 125           | 32           | 62                 | 72         | 14          | 48                    | 44         | 49         | 55         | 48         | 22          | <b>672</b>              |
| “ “ “ 1851..                                 | 140                | 117           | 64           | 68                 | 80         | 30          | 63                    | 54         | 52         | 48         | 55         | 29          | <b>800</b>              |
| “ “ “ 1852..                                 | 130                | 106           | 30           | 68                 | 67         | 33          | 37                    | 43         | 57         | 33         | 54         | 17          | <b>675</b>              |
| Total of five Seasons ..                     | <b>616</b>         | <b>613</b>    | <b>201</b>   | <b>357</b>         | <b>392</b> | <b>129</b>  | <b>245</b>            | <b>236</b> | <b>272</b> | <b>227</b> | <b>271</b> | <b>119</b>  | <b>3678</b>             |



No. XII.—Comparative Mortality in Different Seasons of the Year.

WINTER QUARTERS.

| DEATHS in five Winter Quarters as follows:— | EAST LONDON UNION. |               |              | WEST LONDON UNION. |            |             | CITY OF LONDON UNION. |            |            |            |            |             | Totals for entire City. |
|---|--------------------|---------------|--------------|--------------------|------------|-------------|-----------------------|------------|------------|------------|------------|-------------|-------------------------|
|   | Saint Botolph.     | Cripple-gate. | Work-houses. | North.             | South.     | Work-house. | S.W.                  | N.W.       | South.     | S.E.       | N.E.       | Work-house. |                         |
|   |                    |               |              |                    |            |             |                       |            |            |            |            |             |                         |
| Jan., Feb., Mar., 1849...                   | 136                | 117           | 36           | 73                 | 90         | 30          | 52                    | 63         | 60         | 52         | 77         | 36          | <b>822</b>              |
| " " " 1850...                               | 96                 | 124           | 36           | 91                 | 84         | 40          | 46                    | 45         | 80         | 58         | 74         | 29          | <b>803</b>              |
| " " " 1851...                               | 154                | 140           | 49           | 87                 | 89         | 22          | 59                    | 48         | 81         | 56         | 67         | 24          | <b>876</b>              |
| " " " 1852...                               | 124                | 96            | 48           | 54                 | 101        | 37          | 42                    | 61         | 61         | 50         | 67         | 32          | <b>773</b>              |
| " " " 1853...                               | 131                | 146           | 54           | 66                 | 100        | 54          | 49                    | 57         | 65         | 49         | 75         | 32          | <b>878</b>              |
| Total of Five Seasons...                    | <b>641</b>         | <b>623</b>    | <b>223</b>   | <b>371</b>         | <b>464</b> | <b>123</b>  | <b>248</b>            | <b>274</b> | <b>347</b> | <b>265</b> | <b>360</b> | <b>153</b>  | <b>4152</b>             |

No. XIII.—Comparative Mortality in Different Seasons of the Year.

SPRING QUARTERS.

|   | EAST LONDON UNION. |               |              | WEST LONDON UNION. |            |             | CITY OF LONDON UNION. |            |            |            |            | Total for entire City. |             |
|---|--------------------|---------------|--------------|--------------------|------------|-------------|-----------------------|------------|------------|------------|------------|------------------------|-------------|
|   | Saint Botolph.     | Cripple-gate. | Work-houses. | North.             | South.     | Work-house. | S.W.                  | N.W.       | South.     | S.E.       | N.E.       |                        | Work-house. |
| DEATHS in five Spring Quarters as follows:— |                    |               |              |                    |            |             |                       |            |            |            |            |                        |             |
| April, May, June, 1849...                   | 85                 | 180           | 39           | 77                 | 110        | 34          | 56                    | 55         | 58         | 45         | 50         | 26                     | <b>765</b>  |
| “ “ “ 1850...                               | 80                 | 90            | 19           | 74                 | 71         | 27          | 34                    | 39         | 40         | 43         | 50         | 22                     | <b>589</b>  |
| “ “ “ 1851...                               | 115                | 101           | 48           | 92                 | 79         | 21          | 44                    | 38         | 75         | 70         | 56         | 28                     | <b>767</b>  |
| “ “ “ 1852...                               | 110                | 131           | 38           | 70                 | 121        | 31          | 47                    | 51         | 41         | 47         | 59         | 28                     | <b>774</b>  |
| “ “ “ 1853...                               | 129                | 131           | 51           | 89                 | 90         | 46          | 45                    | 47         | 59         | 50         | 47         | 33                     | <b>817</b>  |
| Total of Five Seasons ...                   | <b>519</b>         | <b>583</b>    | <b>195</b>   | <b>402</b>         | <b>471</b> | <b>159</b>  | <b>226</b>            | <b>230</b> | <b>273</b> | <b>255</b> | <b>262</b> | <b>137</b>             | <b>3712</b> |

No. XIV.—Comparative Mortality in Different Seasons of the Year.

SUMMER QUARTERS.

| DEATHS in five Summer Quarters as follows:— | EAST LONDON UNION. |               |              | WEST LONDON UNION. |            |             | CITY OF LONDON UNION. |            |            |            |            | Total for entire City. |             |
|---|--------------------|---------------|--------------|--------------------|------------|-------------|-----------------------|------------|------------|------------|------------|------------------------|-------------|
|   | Saint Botolph.     | Cripple-gate. | Work-houses. | North.             | South.     | Work-house. | S.W.                  | N.W.       | South.     | S.E.       | N.E.       |                        | Work-house. |
| July, Aug., Sep., 1849...                   | 171                | 199           | 73           | 148                | 295        | 33          | 145                   | 77         | 86         | 77         | 73         | 18                     | <b>1395</b> |
| “ “ “ 1850...                               | 102                | 93            | 26           | 74                 | 65         | 18          | 39                    | 39         | 43         | 31         | 43         | 22                     | <b>595</b>  |
| “ “ “ 1851...                               | 123                | 105           | 38           | 76                 | 73         | 11          | 40                    | 39         | 53         | 36         | 42         | 27                     | <b>663</b>  |
| “ “ “ 1852...                               | 160                | 116           | 26           | 74                 | 77         | 31          | 44                    | 32         | 49         | 26         | 54         | 28                     | <b>717</b>  |
| “ “ “ 1853...                               | 126                | 151           | 20           | 66                 | 52         | 31          | 39                    | 41         | 42         | 32         | 48         | 22                     | <b>670</b>  |
| Total of Five Seasons...                    | <b>682</b>         | <b>664</b>    | <b>183</b>   | <b>438</b>         | <b>562</b> | <b>124</b>  | <b>307</b>            | <b>228</b> | <b>273</b> | <b>202</b> | <b>260</b> | <b>117</b>             | <b>4040</b> |

ON THE PRESENT  
BURIAL-PLACES OF THE CITY.

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TO THE IMPROVEMENT COMMITTEE OF THE HON. THE  
COMMISSIONERS OF SEWERS OF THE CITY OF LONDON.

*December 10th, 1852.*

GENTLEMEN,

**I**N order to an application of the Metropolitan Burials Act by the constituted authorities of the City, you have requested me to report how far, in my judgment, the existing burial-places within this jurisdiction are fit for further reception of the dead.

I have little to add to the information which I have laid before the Commission in my successive annual reports—especially in that of 1849, and which long since induced me to express my conviction ‘that the City of London could no longer with safety or propriety be allowed to furnish intramural burial to its dead.’

It would, indeed, be ridiculous if I should pretend to you that this part of the subject requires any further inquiry. Putrefactive decomposition of one kind and another is the principal cause of town-unhealthiness. Against its occurrence round about our houses all your legislation is directed. The human body, once destitute of life, furnishes no excep-

tion to the laws of organic decay: under the common laws of chemical change, it soon dissolves itself into products neither less offensive, nor less poisonous, than those of any brute's decomposition. And you cannot take a juster view of the subject—you cannot arrive at stronger arguments for the immediate abolition of intramural interment, than by forcing yourselves to discard for a moment all memory of the fading human outline which masks this dreadful nuisance, and to conceive it as *a mere bulk of animal matter*, planted every year to undergo decomposition within the City, beneath our Churches, and before our thresholds.\*

Dead bodies thus buried contribute importantly in their neighbourhood to the vitiation of air and water. Those that lie shelved in vaults, eventually, if not at first, spread through the atmosphere every product of their decomposition. Those that are dug into the soil have their decay modified by its influence, mingle with its drainage the products of their transformation, and thus (as I have shown in my remarks on the Bishopsgate pump water) find their issue in the nearest land-spring of the spot, polluting the drink of the population. Further, in all the more frequented burial-grounds, the soil seems to be saturated with animal matters only partially transformed; and at every new disturbance by the spade, a fresh quantity of this unctuous clay comes upmost, tainting the air with materials of foetid decomposition, often to the great distress of persons who dwell in the vicinity.

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\* The right of interment in the City may at present be claimed in respect probably of more than three thousand corpses *per annum*. The number actually interred of late years has, I believe, not exceeded an average of two thousand *per annum*.

On such grounds as these, I cannot hesitate in renewing my report that the City of London is absolutely unfit to serve as a further burial-place for the dead; and this, whether by inhumation or in vaults, whether in parochial burying-grounds, or in those of other communities.

Regard being had to the object of your reference, you would probably not desire me at present to enter on the ulterior questions of extramural interment.

On such representations as I have made, the Court of Common Council (acting under the Metropolitan Act already referred to) has authority to determine in respect of the City of London, whether the existing places of burial, either from their insufficiency, or from their dangerousness to health, are so unfit for their purpose as to render it necessary that other burial-space be provided.

Should they affirm this view, they can then 'authorise and direct the Commissioners of Sewers of the City of London to exercise for the said City and Liberties all the powers and authorities vested in Burial-Boards under the Act.'

This course being taken, the Commission (subject to approval from the Secretary of State) will have authority to make all arrangements requisite for the final closure of burial-places within the City.

In approaching the subject of extramural sepulture, with its innumerable details of inquiry, for site, for conveyance, and for burial—details which form the knowledge and experience of a special class of persons, the Commission may perhaps first consider whether works so foreign to their usual functions shall be undertaken by themselves directly, or shall be made matter of contract with existing

Cemetery Companies, or other associations or individuals. Till this decision is made, it seems impossible to conjecture what topics you may wish to entertain, or within what limits the industry of your officers may most usefully be exercised.

There are many very important parts of the subject with which it may hereafter become my duty to deal; but till the preliminary questions are settled, it would be idle to detain you with sanitary considerations belonging to a later stage of your inquiry.

As my Report for 1849 had long been out of print, I subjoin an extract from it of so much as relates to the matter in hand.\*

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\* The passages here referred to form a separate section of the First Annual Report; and therefore need not be reprinted in this part of the present volume.—J. S., 1854.

## N O T E.

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*On considering the above Report, the Improvement Committee of the Commissioners (to whom the subject had been specially referred) at once resolved to report to the General Court that, in their 'judgment, steps should be taken for closing the several burial-places within the City;' and at the same time they desired that the Officer of Health would prepare for them his opinion on those ulterior arrangements which such closure might render necessary.*

*The following Report was written accordingly.*



# INTRODUCTORY REPORT

SUGGESTING THE

OUTLINE OF A SCHEME

FOR

EXTRAMURAL INTERMENT.

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TO THE IMPROVEMENT COMMITTEE

OF THE

HON. THE COMMISSIONERS OF SEWERS OF THE CITY OF  
LONDON.

GENTLEMEN,

**U**NDER the several clauses of the Metropolitan Burials Act, and under certain clauses of the City Sewers Act 1848, the Commissioners of Sewers, acting as a Burial-Board for the City of London, will be subject to the following responsibilities—viz. :

*First*,—That a sufficient extramural burial-place be provided for those classes of persons who have heretofore had right of interment within the City;

*Secondly*,—That the facilities of transit and conveyance to such burial-place be commensurate with the purposes for which it is established;

*Thirdly*,—That evil no longer accrue to the health of the City from unnecessary delays of interment, or from the keeping of dead bodies in the dwelling-rooms of the poor.

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I. To measure the sufficiency of a burial-place, one must know for what numbers of population it is intended to suffice.

Burial-Boards under the new Act are obliged to provide accommodation for all *parishioners* or *inhabitants* of the several parishes within their jurisdiction.

Under the term 'parishioners' as relating to the City, there may be included, I am told, an indefinite number of non-resident rate-payers: and although, at first, interment might not be claimed under the latter head to any considerable extent, yet, with the completion and success of your Cemetery, the applications might year by year become more numerous. From the nature of the case, such claimants would in most instances be of the wealthier classes, and might consequently be expected to apply for special allotments of ground. It seems therefore desirable that you should have some knowledge of the number for whom you may thus be required to provide.

I would accordingly suggest as expedient, that a legal opinion should be obtained on your exact liabilities under the law referred to; and especially as to whether the right of burial possessed by non-resident rate-payers does likewise extend to the non-resident households of such rate-payers.

In the meantime I will leave this set of claimants out of my argument; assuming that, whenever you have reckoned

their number, you will be able, on their account, to add to your general estimate, according to a fixed proportion, the assessment of whatever additional accommodation they may legally require.

The number of deaths belonging to the 'inhabitants' of the City of London may be more precisely given. It would probably lie, as an average, within 3200 per annum.

In attempting to fix the extent of ground required for your purpose in respect of this mortality, I must bring before you some preliminary considerations.

First,—as regards the *minimum accommodation* to be given in your Cemetery; I assume that every person buried there, however humble his previous station in life, may in death claim a grave to himself. It has been the opprobrium of our previous system that, in the poorer classes of interments, many bodies have been huddled together into a single pit. Probably you will think, as regards your future burial-place, that no consideration of cheapness can justify this indecency: probably you will be unwilling that, in a presence which confounds all social comparisons, there should be drawn, with your sanction, between rich and poor any so disrespectful distinction. But at all events, on sanitary grounds, I feel bound to assure you that these multiple burials are quite inadmissible. With such concentration of organic remains in very narrow compass, the soil grows utterly foetid; and it becomes impossible to guard against nuisance arising to the public, or against danger to those who are occupied in digging and tending the ground. These evils, indeed, are so glaring, and the indecorum of crowded interment has long been so notorious, that nothing could have given them continuance except the

necessities of our narrow accommodation under the system of intramural burial: and it would of course be without excuse to perpetuate them under the changed circumstances of extramural Cemeteries, where space can so readily be obtained for all legitimate requirements of the public. So far as the experience of other countries may help to determine your judgment in this matter, I may inform you that, in every foreign interment system which can deserve to be considered an establishment of public authority, the right of single burial is universally recognised.

Next—as regards the *succession of interments*; according to the burial-usages of modern times, no public Cemetery with fixed limits can be permanently useful, except on a full recognition of the fact that it is a decaying place for the dead, not a place for their embalment or mummification. For hence it follows, that ground once used for burial becomes equally fitted for a second use, whenever by gradual decomposition the bodies first interred there have thoroughly vanished from the soil.

This principle has given the common rule of burial; and for obvious reasons. Under any other plan, the entire area allotted for interment would presently be in holding. No portion, however remote the date of its first occupation, could be resumed for a second series of interments; and the provision of a new Cemetery would be indispensable. Pushed to its extreme consequences, such a system must eventually convert the entire country into its burial-ground.

Under the practice of intramural interments—that practice which the new law supersedes, the principle of temporary tenure has been made to cover all manner of brutal

abuses. Graves have been disturbed—within metropolitan churchyards and other burying-grounds, in which the transformations of decay had not half accomplished themselves; and public decency has been outraged—here, in the centre of civilisation, by the spectacle of human remains being tossed about like offal. It is one chief advantage of extramural sepulture, that, while the inevitable decay of the dead will be removed from the vicinity of the living, and the latter will no longer have their atmosphere tainted by this hideous contamination; so likewise for the dead—however humble, that in this new resting-place, room will be allotted them with no indecent stint; that the dwellings and market-places of the living will no longer hem them in, grudging their narrow requirements; that their return to dust will be respected, as beseems the last phase of mortal existence; and that, against any desecration of their repose, there will be given every security which piety and affection can demand.

There may be difference of opinion as to the precise time when a grave can with truth and decency be thought to have become distenanted. The rapidity of decay varies in so extraordinary a degree according to soil, that some inhumations are almost equivalent to embalming; while, in other cases, the process is comparatively rapid. Only experience of a particular soil will enable you to know with precision, what length of tenure is needed there for the purposes of interment to accomplish themselves; but on general principles one can approximate pretty nearly to the truth. Assuming the site of your Cemetery to have been selected with due regard to those qualities of soil which determine the differences adverted to, I think it unlikely

that any adult grave can properly be re-opened within twenty years\* of the time when interment shall last have occurred in it. Very long within this time, however, all soft textures of the body would have completed their decay. Remains of the coffin and of the skeleton—materials insusceptible of putrefaction, would alone occupy the grave, and with gradual crumbling blend themselves in the soil. Not till this final disintegration of the skeleton is complete—not till the identity of its different elements is destroyed, can the first occupant of a grave be fairly deemed to have abdicated his tenure. From this time only, can his interest in it be held as having reverted to the public, for whoever next may claim a similar usufruct of the ground.

Taken for granted that, as regards the general public, your Cemetery will be established on the principle of a temporary tenure of graves, it remains for you to determine to what extent you will permit wealthier applicants to purchase exemption from this rule, and obtain a freehold interest in particular portions of your ground. I have little to say on this point, because it is of no sanitary importance, provided that privileges so purchased do not in any degree interfere with the general economy of your plan. Barring any risk of this kind, it comes before you simply as a question of finance.

A precaution, however, which I would suggest, is, that,

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\* Twenty years would probably represent at least four times the average period during which the bodies of the poor have been left at rest in many grave-yards of the metropolis. Yet I would willingly advocate a longer term of years as the personal tenure of a grave, if public opinion would sanction the heavier expense which must thus be entailed on the living.

first of all, you should provide a cemeterial space sufficient for the interment purposes of your population, on the principle of temporary tenure; that no portion of this space should, under any circumstances, be alienated from its public destination; that the whole of it should remain in perpetuity the common burying-ground of the City of London. This prime necessity of your plan being secured, it will be competent for you to include in your purchase a certain redundant number of acres; and out of these you can allot, at your discretion, such quantities of ground as may be desired in freehold, either for the purposes of family interment, generation after generation, or for the fiction of perpetual tenure by some single occupant.\*

In thus selling portions of your land for private and privileged employment, you would be satisfying what has become a habit, and may be considered a legitimate claim of the wealthier classes. Beyond this, it is also evident, that you would virtually be competing with the ordinary Cemetery-companies of the metropolis, in the most lucrative

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\* In regard of these exceptional burials, it will be requisite to fix certain regulations; especially for the construction of family graves: wherein it will be desired that many who during life have been united, shall after death have their ashes mingled together in the soil. A frequent custom in private Cemeteries for fulfilling this purpose has been, for graves to be dug to a considerable depth—sometimes such that twelve coffins could be piled there, one on the other; and these deep pits have commonly been provided with brick walls. Now, for the same reason as determined my opinion against the multiple burial of the poor, I would argue against this arrangement, as one which might occasion excessive accumulation in single spots of your Cemetery, and as being in principle bad. In preference, I would venture to recommend the endeavour to introduce an interment-custom, which is prevalent abroad, of *family plots of ground*

department of their trade. It would probably be easy for you, by varying your fees according to circumstances, either on the one hand to diminish, and almost prohibit, the frequency of applications for exceptional interments; or, on the other hand, to attract such applications. Even, if you thought it desirable, you might admit purchasers from other classes than those having right of burial in your municipal Cemetery;—in short, you might manage it commercially, with a view to profit, looking to its proceeds for covering many expenses of the general establishment.

With respect to the ordinary arrangement of your ground for public purposes, and the distribution of burials therein, you may estimate that, taking one grave with another, and allowing for the marginal spaces of each, the average size of a grave will be twenty-eight square feet. For illustration's sake, I will suppose the ground to be laid out in plots—say the third of an acre in extent. Each such plot would contain four hundred single graves, mixed adult and young, with what foot-paths might be requisite for

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*instead of family pits.* Under ordinary circumstances, all the accommodation heretofore sought in the one arrangement would be found superiorly in the other; and in a well-projected suburban Cemetery the larger superficial extent could probably be afforded at much less cost than is usually paid for the pit. Persons familiar with the details of Cemetery-burial would easily devise an arrangement of such plots, whereby they should be separate and secluded, admitting of appropriate decoration, and altogether likely to prove more acceptable to public opinion than many existing arrangements. In regard of such plots, too, there might be conceded a privilege which I believe has not been allowed in private Cemeteries; namely, an hereditary right to refill the ground for any successive number of times, subject only to such restrictions as will determine the succession of interments in other parts of the Cemetery.



approaching them. The City mortality of twenty years (assuming this period to be the ordinary leasehold of a grave) might be reckoned at sixty-four thousand deaths; for the accommodation of which number there would be wanted one hundred and sixty plots of the above-mentioned size—say fifty-four acres of ground. I would propose that throughout each line of every such space, adult and infant graves should, as far as possible, lie alternately; and that, instead of filling all the graves together at stated periods (say every twenty years) half of them, taken alternately, should be filled at each semi-period—say every ten years. By this arrangement, half the complement of burials would take place in each plot, at a time when the decomposition of the preceding half-complement had finished itself, so far as putrefaction is concerned; and whatever contamination of air might be liable to occur under the best-considered sanitary arrangement, would certainly be reduced to the lowest conceivable amount. Or, as an alternative equal to this arrangement for the purposes of health, you might adopt the plan of filling in immediate succession all the burial-spaces of a plot; provided the surface could then at once be devoted to the growth of appropriate vegetation.

Fifty-four acres being then the quantity of ground which would suffice, on sound principles, for the ordinary interment of your entire annual mortality during a period of twenty years; at the expiration of which time (assuming your soil to be appropriate) one may reasonably expect that the ground will admit of a second similar occupation; and so forth in perpetuity: it will be requisite to add a considerable allowance of space for other accessory purposes.

Thus, room would be required for the various buildings

that belong to the institution of a Cemetery: partly for the dwelling of such officers as you may require to be there resident, partly for the temporary accommodation of persons resorting thither for the burial of their friends, partly for the religious services of different congregations.\*

Something likewise must be added for such mainways as will be wanted along various lines of the burial-ground, for the carriage traffic which belongs to funeral ceremonies among the richer classes of society, and for other like purposes.

Further, I dare say you would think it inexpedient that your Cemetery should be entirely without decoration and elegance. Fifty-four acres of head-and-foot stones, or the same extent of bare mounds, might vulgarise even the aspect of death. By the judicious introduction of trees and turf and shrubs, of bends and undulations, you would probably seek to interrupt the long perspective of so many tombs, and, by these artificial resources of planning and planting, to enhance the native solemnity of the spot. Amid such ornamental portions of your ground might be scattered irregularly the various sites of exceptional interment,—family graves, personal graves in perpetuity, long leasehold graves, and the like; and the interposition of these large portions of comparatively un-occupied soil, with as much appropriate vegetation as could conveniently be introduced, might not only allow much tasteful decoration of the ground, but

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\* The distinction of the ground into a consecrated and an unconsecrated portion, as required by the Act of Parliament, will require no addition to its total area; and therefore the proportion which these parts should bear to one another need not now be discussed.

would likewise conduce to the healthful accomplishment of those purposes for which the Cemetery is established.

In respect of these and many other details of your plan, you will doubtless be guided by the direct and responsible advice of men specially skilled in the subject. I have, therefore, confined myself to the mention of those points which may determine your judgment merely as to the quantity of land required for your purpose.

Without offering any opinion as to the possible claims of non-resident parishioners, on which liability I would again suggest your obtaining a legal opinion; and without pretending to advise what allowance should be made for purely decorative purposes; I may yet conclude from such information as I have collected, that, with a hundred acres of suitable soil at your disposal, you would be amply able to meet all legitimate burial-requirements of your population in perpetuity, and would likewise (for many years at least) have a considerable excess which might be applied to the uses of ornamental arrangement.

From what I have said on the influence of soil, in determining the period after which burying-grounds may be resumed for a second series of interments, it will be obvious to you that this condition is an important element in deciding the sufficiency of any area for given burial purposes. And the site of your Cemetery might be such as somewhat to lessen, or greatly to increase, the suggested extent of your estimate. It would be fruitless, however, now to detain you with any endeavour to trace the several influences which different soils exert over animal decay. Such remarks, at the present time, could only be addressed to hypothetical cases, or stated in the most general form. Therefore, instead

of attempting this anticipative argument on the subject, I hold myself ready to report to you, specifically, on the suitability of whatever soil may be proposed to you for the purposes of your Cemetery.\*

There is yet one other consideration which may affect the extent of your purchase. The law restricts you from approaching within 200 yards of any dwelling-house, without the previous written consent of its owner, lessee, and occupier. But there is no law restricting the nearness within which any builder may approach your wall with his design for new habitations; and it might easily occur to you, within a short time of establishing your Cemetery, to find a new town growing in close proximity around it. If there be any meaning and value in the clause, which forbids your undue approach to inhabited houses—if it truly represent that this approach would be a sanitary evil, then obviously the law is deficient in the respect adverted to. It would be in your power to guarantee the continuance of a belt of unoccupied ground, as an immediate circuit to your Cemetery, in either of two ways:—either, namely, you might purchase a considerable extent of ground beyond the actual requirements of your Cemetery, might devote its central hundred acres to

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\* For similar reasons, I defer any discussion of the depth at which bodies may most properly be deposited in the ground. The thickness of superjacent soil, which will deodorise, before their escape, the gaseous products of any given decomposing mass, or which will retain these gases more or less permanently in combination, varies most importantly with certain chemical and mechanical qualities of the soil: and on these it would be useless to dwell by anticipation. For accurate results, it may be necessary, after the selection of a site and during its preparation, to institute experiments on the subject.

interment, and might let its remaining circumference for agricultural purposes; or, if you were fortunate enough to be treating for the central portion of some considerable estate, you might stipulate, as a condition of purchase, that no building should be reared within such distance of the wall of your Cemetery, as you, on due consideration, may deem fit.

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II. In the provision of a Cemetery, it is required by the Act of Parliament, that 'the Burial-Board shall have reference to the convenience of access thereto from the Parish or Parishes for which the same is provided;' and it is legalised, that 'any Burial-Board may make such arrangements as they may from time to time think fit, for facilitating the conveyance of the Bodies of the Dead from the Parish, or the place of Death, to the Burial-ground which shall be provided.'

It cannot but be obvious to you, that the choice of a site for your Cemetery might be such as to interpose very serious obstacles in the way of interment, even for the richest classes; and under the most favorable circumstances, the removal of the dead to a distance of some miles from their previous residence, cannot but threaten serious difficulty to the poor. Assuming—what various conditions of the Act of Parliament render almost inevitable, that your Cemetery must be distant at least six miles from the centre of the City, the present funeral charges can hardly be maintained without increase, if the traffic is to be conducted on the same principles as heretofore. The price for which

an artisan could procure a decent funeral for his wife or child, within a stone's throw of his door, will unavoidably be augmented by every mile you add to the distance, if the conveyance is still to depend on the old means and arrangements.

When I consider the classes of persons likely, as inhabitants of the City, to claim interment in your Cemetery—classes, among which the predominance of narrow, if not necessitous, circumstances will be frequent; when, for instance, in a year's official returns, I see that artisans and paupers make more than two-thirds of your entire classified mortality; I cannot but think this aspect of the matter a very important one. From some years' experience of your death-register, I should say that, of City funerals, there would not be one in ten where the friends could afford to disregard an additional expenditure of half a guinea; and, in the majority of instances, I am persuaded that a smaller addition would be enough to cause inconvenience and distress. It therefore seems to me certain, that your plan for extramural sepulture, however perfect at all other points, might either entirely fail of its purpose, or become cruelly oppressive to the poor, by the simple expensiveness of approaching the burial-place. And I suppose it was in anticipation of the difficulties here adverted to, that the framers of the Metropolitan Burials Act introduced the permissive clause, which I just quoted, empowering Burial-Boards 'to facilitate the conveyance' of the dead, and thus virtually rendering them responsible, so far as the poorer classes are concerned, for the cheapness and efficiency of such conveyance.

I would therefore submit, that in your decision as to the site of your Cemetery, so soon as the indispensable conditions of appropriate soil are given, the first point to examine is accessibility; that the spot to be chosen should have, in addition to its carriage roads, the utmost facility of railway approach; and that, for those with whom small differences of price are an important consideration, you should be able to guarantee a rate of transport for coffin and mourners, not in excess of existing charges.

From observation of arrangements which have lately been made with Railway-Companies by the Directors of Cemeteries, and from inquiry of persons engaged in such undertakings, I entertain little doubt that you might make a contract to the following effect with the authorities of any line convenient for your purpose—viz., that every day, at a fixed hour, there should be a train, or some portion of a train, exclusively adapted to the funeral purposes of the poorer classes; that for this train there should be issued funeral tickets, franking the conveyance of a coffin with some stated number of mourners, who should also be entitled to return; that the introduction of funeral traffic should be by a special entrance, and its exit at a special terminus.

Such contract supposed,—in connexion with this funeral train, you might further arrange to maintain public hearses; which, at the option of persons concerned, and on due requisition being made, should convey any coffin from its former home to the railway terminus; and which again, if necessary, at the distal station, should complete its conveyance to the grave. This facility might even be extended, if the distances were considerable, to the similar

conveyance of a certain number of mourners, with the undertaker in charge of their procession.

Also, if desirable, it could no doubt be arranged, with a view to economy, that the undertaker's responsibility for a funeral should terminate at the railway terminus, up to which he would have conducted it; and that its reception at the distal station should be entrusted to servants of your Cemetery, who would then fulfil all remaining duties in respect of it.

Arrangements to the above effect would be much simplified in working, and their general adoption much promoted, if all disbursements for funeral tickets, and for such other facilitations of conveyance as I have adverted to, were made by your Burial-Board,—their cost to be included in an uniform Cemetery fee; so that the friends of the deceased, after paying for his grave, should, without further payment, be entitled, if they desired it, to claim conveyance for his coffin from home to the Cemetery, and for themselves (in stated number) by a funeral ticket, at least for the railway portion of their transit. Thus to have one single and inclusive price for all that belongs to the new system—for the extramural grave, namely, and for conveyance thereto, would enable your Burial-Board to maintain its total cost at a level within reach of the poorer classes, and probably below that of existing prices.

In addition to what I have here suggested, there are many other steps which might be taken, if unforeseen circumstances should render them necessary, to diminish the pressure of new burial-charges on the poor. Time will develop, better than one can foretell, the exact operation of our reformed system; and for such inconveniences as it



may bring, you will have no difficulty, I think, in finding appropriate cures. Nor could it be otherwise than easy, if you thought it desirable, to extend to the comparatively few funerals of wealthier classes which occur from within the City of London, those same arrangements for facilitating conveyance, which I have here deemed it requisite to consider only in their relation to the poor.

For the latter, it has seemed indispensable that your scheme should provide assistance, equivalent at least to the difficulty which its adoption must occasion them. Beyond this, I believe you would wish to disturb as little as possible the ordinary routine of interment; and I have aimed, therefore, at suggesting assistance only in such kind, and in such degree, as may least interfere with any interests of trade, least derange any established habits, least offend any prejudices of the people.

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III. There is no part of the subject which I have considered with more anxiety than that which relates to delays of interment, and to the prolonged keeping of dead bodies in the rooms of their living kindred.

Evils arising in this source are unknown to the rich. Soldered in its leaden coffin, on tressels in some separate and spacious room, a corpse may await the convenience of survivors with little detriment to their atmosphere.

Not so in the poor man's dwelling. The sides of a wooden coffin, often imperfectly joined, are at best all that divide the decomposition of the dead from the respiration of the living. A room, tenanted night and day by the family

of mourners, likewise contains the remains of the dead. For some days the coffin is unclosed. The bare corpse lies there amid the living; beside them in their sleep; before them at their meals.

The death perhaps has occurred on a Wednesday or Thursday; the next Sunday is thought too early for the funeral; the body remains unburied till the Sunday week. Summer or winter makes little difference to this detention: nor is there sufficient knowledge on the subject, among the poorer population, for alarm to be excited even by the concurrence of infectious disease in a room so hurtfully occupied.

I have no means of telling you, with statistical precision, in how many of your annual deaths the corpse is detained in dangerous proximity to the living. But I have already quoted an official classification of deaths, by which it would appear that more than two-thirds of your deaths are of the artisan class or below it. Among them at least, it would be exceptional for the corpse to have a room to itself. On an average, then, there would probably be lying within the City at any moment, from thirty to forty dead bodies in rooms tenanted by living persons.

This very serious evil is well known to all persons who have taken an interest in the sanitary advancement of the poor; and ineffectual endeavours have been made for its diminution. The law does indeed empower your Officer of Health, under certain circumstances, to order the removal of a corpse from any inhabited room. And, under the Nuisances Removal Act, the General Board of Health may be authorised, during times of epidemic disease, to issue directions and regulations for the speedy interment of the

dead. Both laws have remained inoperative, and are likely to remain so.

If one were starting anew—legislating for a people with unformed habits, nothing might be easier than to devise regulations of a perfect kind with regard to the sanitary management of the dead. But our case is widely different. The evils against which we have to contend are among the deepliest-rooted habits of the country. In defence of what exists there are many stupid and ignorant prejudices: but, interwoven with these are feelings of tenderness and affection, to which all consideration and reverence are due;—feelings which would be shocked and outraged by any abrupt endeavour to reduce the care of the dead to a system of fixed regulations.

For myself, having the deepest sense of the evil in question, and having officially the power to order the removal of the dead, I may repeat that I have never yet exercised my authority. Practically speaking, I can hardly conceive an instance in which I should attempt to do so. It would require the strongest case that could be shown of actual mischief in progress—of disease and death multiplied day by day through the presence of some particular dead body, to justify interference even in that single instance. Nothing like the operation of a general law would be tolerated;—nothing like including the dead in a compulsory plan of hygienic police.

After very careful consideration of the subject, I may confess myself even more impressed with its difficulties than when I first began to give it my attention; and in the few suggestions which follow I cannot pretend to do more than intimate where, in my opinion, a beginning may use-

fully be made towards an improvement which it will take many years to accomplish.

Legislative remedies, proposed for the evils which I am bringing under your notice, have been of two kinds—viz., *first*, to restrict the time during which it should be lawful to keep a body unburied; *secondly*, to promote the use of reception-houses (as they have been called) whither bodies might be removed from within all dwelling-places, and be kept under certain regulations during the days preceding their interment.

As regards the first point;—there are many foreign countries (and even some parts of the United Kingdom) where either law or custom has made it imperative to bury within two, three, or four days of death. Our habit, unfortunately, is to keep the corpse unburied for twice as long. A week may probably be considered our medium interval between death and interment; and with this delay, I need hardly tell you, the body becomes putrid—sometimes intensely so, before the time for its removal arrives.

Among the wealthier classes, as I have said, this delay is practically unimportant; except in so far as every repetition maintains the pernicious custom. Scarcely on account of any risk arising to themselves in emanations from the dead, but mainly for the sake of influence and example, would one wish the educated classes of the community to adopt the usage of earlier burial. Our present practice is upheld by no law of necessity; nor for the most part does it represent any extravagance of grief, or fond reluctance of separation. Chiefly it subsists by our indolent acquiescence in a

habit, which former prejudices and former exigencies established. Fears of premature interment, which had much to do with it, are now seldom spoken of but with a smile. The longer interval, once rightly insisted on as necessary for the gathering of distant friends, has now, in the progress of events, become absurdly excessive: in a vast majority of cases, all whose presence is needed, live within a narrow circle; and the more distant mourner, who, fifty years ago, would have spent several days in coming from Paris or Edinburgh, can now finish his journey in twelve hours. It is much to be wished that, under these changed circumstances, an altered practice might ensue in the upper classes of society, fixing their time of burial within three or four days of death. Such example of wealthier neighbours, aided by greater enlightenment and education among themselves, would greatly tend to detach the poor from many observances and delays, in relation to the dead, which, in their narrow dwellings cannot continue with impunity.

But, as regards these poorer classes, cannot anything be done in connexion with your new arrangements, to abridge the period of delay? As for any positive regulation, limiting the time during which it should be allowed to retain dead bodies in certain dwelling-houses,—such could only be enforced by an extensive organisation of sanitary police, which you would have to call into existence for the purpose, and which, in the present state of public opinion, would encounter insurmountable difficulties on every occasion of its authoritative interference.

It is by indirect means and inducements alone, that I can hope at present to effect the desired alteration; and by

them, I think, something can be ensured toward shortening the delays of interment.

First, I believe that everything which cheapens the cost of burial, will conduce to such a result; for, among the poor, one considerable cause of procrastination must often be the immediate absence of money. The plan of conveyance and payment which I have suggested, would at least ensure you against any increase of this difficulty, and might readily be applied to diminish it. For, under such a system of single payment for grave and conveyance, it would be practicable, and, I think, most advantageous, to fix two prices, with a difference of at least five shillings between them; to charge the lower fee whenever the funeral should occur within eighty hours of death, the higher whenever this period should be exceeded. If, by the general adoption of the former alternative, the Cemetery receipts should be diminished in respect of artisan funerals, even to the utmost extent—say five or six hundred pounds per annum—this money, or much more, would have been advantageously expended in purchasing so great a reform. If, on the contrary, the immediate option of the working classes should be in favour of continuing a system so injurious to themselves and to their neighbours, there would be no injustice in leaving them the incumbrance of a cost, from which it would require only their own will to escape. The difference of price would soon be recognised as a municipal tax on delays of interment;—a tax, rendered legitimate by the public evil which it is designed to correct, and guarded against remonstrance, because any man may avoid it who will. And since the delays in question often arise in a passive habit of the people, founded on no deliberate intention or reason, I cannot but believe that a well-marked difference

of fee would, as it were, startle the poor into considering the question, which would come to be of daily argument in their houses:—‘Is it worth while that our funeral cost should be increased by the amount of one or two days wages, in order that we may retain within our dwelling-rooms four days longer, that which every one tells us is hurtful to ourselves and to others?’

It has been suggested to me, that many delays occur owing to Sunday being considered specially as a funeral day among the labouring classes; that an equal distribution of burials over the week would be preferable to this waiting for a particular day; and that the closure of your Cemetery on Sundays might accordingly be beneficial for the purposes under consideration. Many arguments will doubtless occur to you, both for and against the desirability of Sunday interments; but this probably may be regarded as a point of detail, more fitly to be considered when your scheme is complete, or even when it has actually given you some experience of its operation.

As regards the second point adverted to—the establishment of special reception-houses for the dead, I do not hesitate to say that, if they could be brought into general use, their institution would confer great advantages on the poor. But against this event, at least as an immediate one, I grieve to see strong probabilities.

A first proposal made to some mourning household, that they should trust to strangers’ hands the custody of their unburied dead, would in most instances greatly and suddenly clash with their customs, and prejudices, and affections. Whatever success you might have in conquering this difficulty would of necessity be slow: and my practical familiarity with the poorer classes makes me so little hope-

ful of their immediate acquiescence in the plan, that I should hardly feel justified in urging you to incur any very large expense, or to embarrass yourselves at starting with any elaborate machinery, for the sake of so scanty an expectation.

The reception-houses of Germany, as you probably know, are founded with a double intention; partly for the purpose which I am here chiefly considering—that the dead may be removed from an injurious contiguity to the living; partly also, that the bodies may be vigilantly observed, in case of suspended animation. With the latter view, many of them are specially furnished and specially officered. In that at Frankfort, for instance, each body is placed in a separate, warmed and ventilated cell; cords are attached to the fingers in such manner that the slightest movement occasions the ringing of an alarm; night and day watch is kept in a central apartment which looks into each cell, and has the several alarm-bells hung round it; adjacent is a room designed for acts of resuscitation, with bath, galvanic apparatus and the like, always in readiness for instant use; and, so long as any corpse lies within the reception-house, the medical superintendent of the establishment never goes beyond its walls. Dr. Sutherland, whose report to the General Board of Health is full of interesting information on the burial-institutions of the Continent, praises the completeness and ingenuity of these contrivances; adding, however, that ‘after careful inquiry at all the cities where he found them to exist, he could not learn that any case of resuscitation had as yet occurred.’ I may add, too, as regards my own personal experience in this country, that, with extensive opportunities, it has never happened to me, either to see any case of suspended



animation where doubts of death and question of interment could arise, nor to hear in professional circles of any such occurrence. I therefore think it quite unnecessary to recommend any arrangement of reception-houses, with reference to the resuscitation of persons apparently dead.

The object for which I would desire their institution, is exclusively that of receiving dead bodies out of the houses of the poor, in order to mitigate those evils which arise in prolonged retention of the corpse. That this object is in itself very desirable, and that under the prevalence of epidemic disease its accomplishment might be of urgent necessity, you will not doubt: and the responsibility for fulfilling it—or at least for giving all facilities to its fulfilment, is so distinctly imposed on you by the letter and spirit of the law, that you will probably wish to take measures accordingly.

The extent, then, to which my information on the subject would lead me to recommend provision to be made, is this: I would advise that accommodation of an appropriate character (savouring in style rather of an ecclesiastical construction, than of the workhouse or dissecting-room) be arranged for the reception of fifty coffins. For this purpose I would suggest—not the building of several separate reception-houses within the City of London, in order to their being respectively adjacent to the portions of population which might use them,—but rather the establishment of one only, and that on the site of your Cemetery. Thus the conveyance of bodies which would take place under your auspices, might be made with greater economy, since it could work into the plan I have already suggested. The advantage of having only a single edifice (especially since its use is likely to be limited) and of including its superintendence in

the general organisation of your Cemetery, cannot be questioned. And it seems to me, likewise, that a building designed for the reception of many dead bodies, cannot conveniently be established in the heart of the City.

I would of course recommend that the use of this building should be entirely optional with the poor, and that its advantages should be allowed gratuitously to persons burying in your ground: so that any one who, in respect of his cemetery-fee, would be entitled to have a corpse conveyed thither for funeral purposes, might claim this conveyance as soon as he chose after the occurrence of death, and might have the coffin kept with all proper formalities in the reception-house, till the moment fixed for its interment.

On further particulars connected with this part of your arrangements, I do not think it requisite at present to dwell; especially because, while I regard the establishment of a reception-house to be quite indispensable to the complete fulfilment of your new responsibilities, I still look upon it as an institution to be gradually developed in the course of years, and according to circumstances yet undetermined, rather than as something which ought at once to assume its permanent character and proportions.

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Here, too, in concluding this introductory report, I may observe that I have endeavoured as far as possible to avoid encumbering it with detail. For myself, in its construction, I have thought it indispensable to pursue the subject into minuter ramifications, to consider a vast number of circumstances here scarcely mentioned, to make myself acquainted with the burial-customs of other countries, to

review a great variety of opinions and arguments which have been advanced on the several matters alluded to, and to consult with persons practically versed in them. But to have brought all this material before you, would have prolonged my report to an inconvenient extent with no proportionate utility.

Further, as regards these details of the subject, there are many parts on which I cannot address you with the confidence that belongs to personal knowledge. The general principles which I have set before you, do indeed lie within range of my official and professional observation. But the next stage of your inquiry relates to matters of special pursuit with which I am only indirectly conversant: and whatever information I may have compiled for myself from other sources, you will probably best obtain at first hand. Practical experience in the construction and working of Cemeteries has now for many years been the growing knowledge of persons connected with their administration by ties of business, or by official appointment. In many instances it has been dearly purchased; and notorious failures have arisen from its absence. Regard being had to the magnitude of your undertaking—hitherto unprecedented in the country, and to the immense interests involved in your success, I cannot but earnestly hope that such experience may be made available for your information.

At an early period you will have to determine what appointments will be requisite, with a view to the architectural and other designs of your cemetery, to its economical planning and decorations, to the superintendence of its daily working, to its financial management, to the conveyance of bodies, and to all intramural organisation connected therewith. Minute details will be best considered when

these appointments are made, and when you will naturally have the benefit of such practical experience as may best assist your deliberations.

For the task on which you are engaged extends, I need hardly say, far beyond the purchase of certain acres for your burial-ground. It implies for its completion, that you shall possess an adequate plan on which the interment of your population may be managed during many succeeding generations; a plan constructed, first of all, with entire regard to the general good of the public, and next, with as little violence as may be to those habits, prejudices, and interests, which are involved in the present system of interment.

The construction of such a plan constitutes a very large question of municipal policy;—one which, because of its solemn subject, and because of the degree in which human feelings and affections are involved in it, requires to be handled with peculiar discretion and delicacy; but which not the less requires to be contemplated in a large and comprehensive manner.

I have therefore thought I should best fulfil the object of your reference, by bringing before you those general principles which lie at the root of all minute considerations: in order that, having first determined on them, and having taken one collective view of the subject, you may better know at what time, and in what order, and to what extent, you would wish the minor details to be developed for your information.

I have the honour,

&c. &c.

THE END.

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