

P 443 Port. No.

REPORT

OF THE

GENERAL BOARD OF HEALTH

ON THE

ADMINISTRATION

OF THE

PUBLIC HEALTH ACT

AND THE

NUISANCES REMOVAL AND DISEASES PREVENTION ACTS,

FROM

1848 to 1854.

BIBLIOTHÈQUE DU
PALAIS DE LA PAIX
CARNEGIEPLEIN
LA HAYE
PAYS-BAS.

Presented to both Houses of Parliament by Command of Her Majesty.



LONDON:

PRINTED BY GEORGE E. EYRE AND WILLIAM SPOTTISWOODE,

PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY.

FOR HER MAJESTY'S STATIONERY OFFICE.

1854.

1768

LIST OF CONTENTS.

	PAGE
Introduction - - - - -	5
Course taken with respect to Cholera Epidemics - - - - -	6
Mode of Dealing with Premonitory Symptoms - - - - -	8
Results of House-to-House Visitation - - - - -	9
Influence on the Progress of the Epidemic - - - - -	10
Quarantine - - - - -	11
Preparations for Discontinuing Intramural Interments - - - - -	12
Preparations for a more Economical and Efficient Supply of Water	13
Local Applications for the Public Health Act - - - - -	14
Expenditure for Sanitary Improvement of Towns - - - - -	15
Reported state of Local Works under Local Acts previous to the passing of the Public Health Act - - - - -	16
Wasteful Outlays in Inefficient Works - - - - -	18
New System required for Town Drainage - - - - -	19
New Principles of Water Supply - - - - -	20
Application of Sewage as Liquid Manure - - - - -	21
Contracts fulfilled within the Estimates - - - - -	22
Progressive Demand for and Advantages of Pipe Drains - - - - -	23
Improved Local Administration - - - - -	24
Works of Trading Companies as compared with those of Muni- cipalities - - - - -	25
Aids given to Works for Sanitary Improvement - - - - -	26
Indications of Benefits from Complete Works - - - - -	27
Reduction of Rates of Mortality from complete House Drainage Works alone - - - - -	28
Effects of the Waste from Excessive Mortality, &c., on the Physical Condition of the Population - - - - -	30
Effects of the Waste of Adult Life by excess of Mortality, &c., as well as by Emigration - - - - -	32
Expense of New Works to Private Persons - - - - -	35
Want of Information by Towns, &c. - - - - -	36
Comparative Expense and Securities of Legislation by Provisional Orders as compared with Local Acts - - - - -	38
Table shewing Cost of Works on the Old and New Systems - - - - -	40
Incompleteness of the Public Health Act to meet Special Cases - - - - -	41
Objection to alleged Interference with Local Boards - - - - -	43
Objection as to the Employment of Engineering Inspectors, &c. - - - - -	44
Influence of Public Works on Public Health - - - - -	46
Comparison of Expenditure with Sums voted - - - - -	47

国立公衆衛生院附属図書館	
受入先	
受入日	
登録番号	
所在	
Library, National Institute of Public Health	

	PAGE
Extensive Interests unavoidably interfered with, &c. - - -	48
Organised Misrepresentation of New Works spread through the Country - - - - -	49
Saving in Expense of Legislation by Local Acts - - -	52
Attendances of Members of General Board - - -	54
Work in Preparation - - - - -	55
Recapitulation of Progress made in the Execution of the Public Health Act - - - - -	56
Need of Protection for unrepresented Classes - - -	60
Additional Powers needed - - - - -	61
Extent of Attention to the Subject abroad - - -	63
APPENDICES :—	
No. 1. Conclusions obtained with respect to Cholera - - -	64
No. 2. Conclusions obtained with respect to Yellow Fever - - -	68
No. 3. Conclusions obtained with respect to Quarantine - - -	69
No. 4. Conclusions obtained as to Metropolitan and Suburban Interments - - - - -	71
1. Metropolitan Interments - - - - -	71
2. Extramural Interments in Country Towns - - -	73
No. 5. Conclusions obtained on Water Supply - - -	76
No. 6. Table of comparative Results obtainable from new and old Modes of Water Supply - - - - -	86
No. 7. Conclusions obtained as to House Drainage, and the Sewerage and Cleansing of Sites of Towns - - -	88
No. 8. Conclusions obtained as to Drainage of Suburban Lands	90
No. 9. Conclusions obtained on Application of Sewer Water and Towns Manures to Agricultural Production - - -	90
No. 10. Tests for the Examination of Candidates for the Office of Superintending Engineering Inspectors of the General Board of Health - - - - -	94
No. 11. Instructions of the General Board of Health to the Superintending Inspectors - - - - -	96
No. 12. Statement of the Business transacted by, and the Expenditure of, the General Board of Health, from its Foundation in 1848 to 31st December 1853 - - -	102
No. 13. Table showing Deaths and Causes of Death in 1847 - - -	109
No. 14. Table showing Comparison of the Cost in Life of War and Pestilence and Civil Violence - - - - -	112

General Board of Health,
Whitehall, 6th January 1854.

MY LORD,

The term for which we were appointed to administer the Public Health Act now drawing to a close, we beg leave to present, for the information of your Lordship, the following statement of the progress made in the execution of that Act, and of the present state of the business of this Board.

Though the administration of the Public Health Act formed our special and paramount duty, we have been required under the Nuisances Removal and Diseases Prevention Act to devote much attention to several objects of immediate and great urgency, of which it may be proper first to give a brief account.

Shortly after entering on our office the calamity of a second outbreak of pestilential cholera appeared to be impending, and the threatened danger was soon realized.

This pestilence has again, for a third time, appeared, and the part we have been called upon to take with reference to both of these epidemic visitations will, we apprehend, when duly examined, afford means of judging of the public demands for administrative service, such as that which has devolved upon us.

Returns from the registration districts of England and Wales, show that, on the last visitation of 1848 and 1849, about 72,000 persons fell victims to cholera and choleraic disease during the epidemic.

It is known that these returns were not accurate, as also that many deaths occurred which were not registered. In several instances information as to partial outbreaks was suppressed, and there is reason to believe that in many towns, in ill-drained and neglected districts, occupied by the poorer classes, numerous deaths really produced by epidemic cholera, were either not known to have been so caused, or were registered as caused by other diseases.

In Scotland there are no registration returns, but the mortality from the pestilence in that part of the kingdom is believed to have been greater in proportion to the population than in England.

It is probable that not fewer than 80,000 and 90,000 persons in the whole of Great Britain perished by

To the Right Honourable
Viscount Palmerston, G.C.B., M.P.,
&c. &c. &c.

this disease, and, reckoning three attacks to one death, that upwards of a quarter of million were the subjects of the disease in its developed form. It is estimated that of those who died in England and Wales, 30,000 were adult persons of both sexes in the vigour of life.

In the last twenty-two years' war the number of British who were killed in actual battle, including those who fell both in the army and navy, was under 20,000 (19,796), so that there perished in a few months by this one epidemic 10,000 more persons in the prime of life than fell in battle during the whole of the last war.—(See App. No. 14.)

In Newcastle and Gateshead, during the recent outbreak, the mortality has been nearly three times greater than it was in the metropolis in the epidemic of 1848-9, and during the last four months,* even in the metropolis, the deaths from cholera have nearly doubled the number registered in the corresponding period of 1848.

If the pestilence in 1854 spread through the country as it did in 1849, and prove as mortal in its entire course as it has done at its recommencement, there will have perished by the end of next year upwards of 100,000 persons, including in this destruction probably as large a number of the young and able-bodied as have been enrolled in the militia. At the cessation of the epidemic of 1849, the loss of life was as if an entire county, like Cardigan or Huntingdon, had been deprived of the whole of its population. At the termination of the impending visitation the loss may be equal to that of the depopulation of two such counties.

In twelve unions in England in which that epidemic caused 11,170 deaths, returns show that there were 3,567 widows and orphans. The charge upon the rates for the maintenance of persons thus pauperised, for four years only, would probably amount to about 121,000*l.*

At the same rate, the 72,000 deaths in England and Wales would give 23,000 widows and orphans of the class chargeable to the poor rates, and involve for their relief an expenditure of 780,000*l.* for the like period of time. If

* In the period (from January to March) which has elapsed since the presentation of this report, there has been a more decided lull in the progress of the epidemic than occurred in 1848-9, so that at the present period the deaths are somewhat less than in the corresponding period of 1848. In the first six months of the epidemic of 1848 the deaths in the metropolis amounted to 988; in the corresponding period of the epidemic of 1853 they number 802.

to these sums be added the expense of funerals, of medical attendance, and of relief to those who were attacked but recovered, and if Scotland be included, the pecuniary cost of this visitation, (exclusive of the cost to Ireland,) could not have been less than 2,000,000*l.*

Under the Nuisances Removal and Diseases Prevention Act we were charged with the duty of devising and administering measures for mitigating and checking the spread of cholera.

An examination of the results of the preventive measures which were adopted will show that they exercised a very decided influence in checking the progress of the pestilence.

In other countries where no such measures were resorted to, and where the predisposing and aggravating local conditions could hardly have been more intense than in the neglected districts of many of our own towns, the mortality in proportion to the population was, in several instances, much more than double that of Newcastle, the only town in England in which the disease has, in 1853, been epidemic. In Stockholm, for example, the deaths in round numbers were 31 in 1,000 of the population. In Copenhagen they were also 31 in 1,000. In Warsaw they were 35 in 1,000; and in Christiana they were also 35 in 1,000. But in Newcastle, during the recent outbreak, although this has been the severest that has yet occurred in this country, they were 17 in the 1,000.

If the mortality in England and Wales, from cholera, in 1849, had been at the average rate of that which has lately occurred in the places above enumerated, the deaths instead of being 72,000 would have been near 600,000.

That the visitation of 1848-9 was greatly mitigated by the preventive measures that were adopted, will be evident on a consideration of the results set forth in our report on cholera (pp. 143 to 149), and these results, as will be seen below, are confirmed by the recent experience of Newcastle and other northern towns (App. 1, p. 64).

The demands made upon us for assistance on the first outbreak of the epidemic in 1848, rendered it urgently necessary that we should apply ourselves to the subject. Inquiries under the Metropolitan Sanitary Commission appeared to us to have ascertained facts which determined the proper mode of dealing with the pestilence. These investigations, exhibiting the course of the disease in previous attacks, and the results of the experience of medical

witnesses who attended the greatest numbers of the sick, in the districts most severely ravaged, had proved, beyond all question, that in the immense majority of cases the violent and unmanageable form of cholera is not sudden in its approach, but is preceded by a premonitory stage, generally of some hours and often of several days' duration, and that in this stage the disease is controllable. On the other hand, from the experience we had collected from countries and climates the most diversified, it appeared that if this stage be neglected, and the developed stage allowed to come on, one half, or even two thirds, under unfavourable, and one-third under the most favourable circumstances, of those attacked, are certain to perish, whatever may be the mode of treatment adopted.

On these facts we endeavoured to base a system of prevention. In order to discover the disease in its earliest stage, and to bring it immediately under proper treatment, we organized a system of house-to-house visitation, so as to place the inmates of every poor man's house in infected districts under daily medical inspection.

We moreover proposed the opening of dispensaries, at which, in the absence of the visitors, the poor might be provided with medicines at any hour, night and day; and also the opening of houses of refuge for the temporary reception of the inmates of filthy over-crowded houses, in which cholera had either actually broken out or was impending; and we further advised that the medical visitors should be made instrumental in discovering and reporting nuisances, and pointing out the houses and localities which stood in the most urgent need of cleansing.

At first much difficulty was experienced in bringing these combined measures into operation, but as the epidemic advanced the system was extensively adopted, and in many instances energetically and efficiently applied.

The following is a summary of the results:—130,000 persons in the first stage of cholera were by its means discovered and placed under immediate treatment. Of this number 6,000 were on the point of passing into developed cholera, yet only 250 or about 1 in 500 actually did so. Of the whole number brought under visitation in the metropolis (43,737) 978 were on the point of passing into cholera, but only 52 actually did so; so that, on the whole, the numbers which passed from the premonitory into the developed state ranged from one in 500 to one in 800.

In the much severer visitation which has recently taken

place at Newcastle the results are similar. The returns show that during this outbreak 44,611 persons, suffering from diarrhoea and cholera, received relief under this preventive system, but it must be borne in mind that many persons were relieved more than once, so that some deduction from the above number must be made.

The total number of persons discovered in Newcastle, by the house-to-house visitation, in a state of cholera or choleraic disease was 5,497. Of these there were in diarrhoea 5,160; approaching cholera, 271; cholera, 66. The visitors also discovered the corpses of three persons who had died without receiving any medical aid.

Of the 5,160 cases thus discovered in the first stage, 17 passed into the second stage; and of the 271 in the second, 13 passed into the third stage, or into developed cholera; that is, about one in 300 passed from diarrhoea into approaching cholera, and nearly five in 100, or one in twenty, passed from approaching cholera into cholera.

These results mark the greater severity of the outbreak at Newcastle than that in the metropolis in 1849, where, as has just been stated, only one in 800 of the cases of diarrhoea passed into cholera. It is remarkable, however, that in the stage approaching cholera the proportion that went into cholera was nearly the same in both epidemics, this event happening in 1848 in one case in nineteen, and at Newcastle in one case in twenty.

The influence of the house-to-house visitation in checking the progress of the pestilence at Newcastle is shown by the following facts:

On the first week in which the visitation came into complete operation, there were under the care of the medical officers 333 cases of cholera, and 321 of approaching cholera.

In the second week these fell to 76 cases of cholera, and 132 of approaching cholera.

In the third week only 6 cases of cholera and 48 of approaching cholera could be discovered.

In the next three weeks the visitors found but 5 cases of cholera, and 51 of approaching cholera, and the total number of cases treated by the medical officers amounted only to 47 cases of cholera and 86 of approaching cholera.

The medical inspector reports, "These were, for the most part, isolated and scattered cases; in the infected districts the disease was as effectually extinguished as a fire would be by a sufficient water fall."

It is important to bear in mind, as showing that this sudden and rapid diminution of cases was owing in a very great degree to the preventive measures enforced, and only in a subordinate degree to the natural decline of the disease, that, while cholera and approaching cholera fell from 333 to 76 and from 499 to 180, diarrhoea still prevailed, according to the testimony of all the medical men engaged in this service, in as severe a form as before, and in the proportion of 3,398 to 2,327, exclusive of the cases which received aid at the newly opened dispensaries. The diminution was in fact nearly 77 per cent. in the cholera cases; 64 per cent. in the cases approaching cholera; and only 31 per cent. in the diarrhoea cases.

In the town of Stockton-upon-Tees a violent outbreak of cholera occurred between the 5th and 7th of October. The house-to-house visitation began on the 7th and ended on the 20th. During this period there were discovered 503 cases of diarrhoea, 16 approaching cholera, and 11 cholera. Of this total number only 11 ended in death; the whole of the cases of diarrhoea, together with those of approaching cholera, having been stopped from advancing to the developed stage of the disease.

We believe the difference in the proportionate mortality in the towns in which this system was carried into effect, compared with that in towns where no such measures were adopted, whether in this country or abroad, affords a measure of the amount of life which this system was the means of saving.

It may be further stated, that one invariable effect of the system, wherever brought into operation, was to put an end to panic. The people finding they were cared for, and knowing definitely where and how to apply for assistance in the moment of need, became tranquil, and confidence was restored.

Medical officers generally both at home and abroad have expressed their conviction of the efficiency of this system of prevention.

The College of Physicians have concurred in recommending its adoption.

Local authorities, instead of resisting its application as they did in 1848, have recently, in numerous instances, applied for advice and assistance in preparing for its organization. The orders of the Board are more closely and generally executed. The complaints commonly re-

ceived now are of the insufficiency of the powers conferred for accomplishing the objects of the Legislature. From Scotland we have received applications to order works of a permanent nature. Petitions for the application of the Public Health Act have increased. The medical inspectors state that they find a marked change in the towns they visit, compared with the feeling which was very general in 1848; that the local authorities are now anxious to give efficient action to the orders and regulations of the Board, and that they themselves universally receive votes of thanks and urgent requests to repeat their visits.

The Poor Law Boards of Guardians, the Inspectors of the Poor Law Board, the Union medical officers, the Local Boards of Health, and the Boards' medical inspectors are now brought into a far better state of union than in 1848, and join in willing and cordial co-operation.

The officers under the Board of Customs and the Board of Trade, the officers under the Emigration Commissioners, and the medical staff of the Admiralty will, we have reason to believe, be better prepared than in the last epidemic to give aid on a recurrence of outbreaks in the ports.

The Ordnance will, we expect, be ready again to aid with the use of tents, should outbreaks occur at the season of the year when tents can be used, to tent out the population from the infected districts,—a practice which has been found of signal advantage.

Recent experience has strengthened our conviction that the service rendered on the occasion of these local outbreaks, to be at all effectual must be immediate. In ordinary civil service, the delays occasioned by multiplied references and the fulfilment of routine forms, may do little harm, and are borne patiently; but in the case of the application of measures for the repression of epidemic disease, all delay involves the extension of sickness, and the infliction of pain, misery, and preventible death; and therefore when plainly attributable to any public department, tends to make public administration odious to the people.

It was during our direction of preventive measures against the spread of cholera, that our attention was called to the fatal consequences resulting from the isolation of cholera patients, in an infected atmosphere on board ship, under quarantine regulations, and to the total inefficiency of quarantine as a safeguard against this disease.

12 Preparations for discontinuing Intramural Interments.

We deemed it our duty to investigate the subject as closely and extensively as we could, and we embodied the conclusions at which we arrived in a Report on Quarantine, which, having been translated into Italian and French, and widely circulated on the continent, mainly contributed to the conference held at Paris, with a view to the reconstruction and reform of the existing system of quarantine.—(App. No. 3, p. 69.)

Having, under the authority of the Nuisances Removal and Diseases Prevention Act and by direction of Her Majesty's Government, been required to frame a scheme of Extramural Interment for the metropolis, we carefully investigated all we could find to have been done abroad with respect to the economical and respectful performance of this service. While we kept in view the importance of the essential object, that of putting an end to the physical and moral evils resulting from the practice of burying the dead in the midst of the living, we could not treat the disposal of the last remains of the dead as if they were a mere nuisance to be got rid of in any way. We regarded the service, on moral and religious, as well as physical, grounds, as a service to be elevated. We objected to depriving the parishioner of his right to interment in the parochial burial ground, without providing for him an equivalent under public sanction, or to leaving his necessities to the mercy of trading speculation. We also objected to enforcing this great and necessary reform without making provision for compensation to those who might appear to have a just claim to it, as suffering grievous and irrevocable loss from the change. We endeavoured to secure the removal of the dead in such a manner as should be soothing to the friends and relations of the deceased, without being offensive to strangers, or the general inhabitants by the conveyance of the remains in excessive numbers through crowded thoroughfares. To abate the evil of retaining the dead body in the living and sleeping rooms of the survivors, we planned reception rooms on what we believed to be a new, appropriate, and efficient construction. We believed we had provided against the extension of the old evils to new suburbs. We still believe that these objects might be secured without levying rates, with full compensation where compensation is due, and with a reduction of one half of the existing expense of funerals. Though the scheme presented was accepted by Her Majesty's Government, and its main principles sanctioned by the Legislature, yet the powers required for carrying it into

For a more economical and efficient Supply of Water. 13

effect were not granted by Parliament; we were, therefore, unable to render it available for putting an end, so completely as we believed from the facts investigated to be practicable, to the great and growing evils of intramural interment. While we are confirmed in our views by the subsequent general representations of the great body of the clergy, founded on the continued experience of evils which it has been the object of the Legislature to remove, we have, on application from the Home Department, given, as it was our duty to do, every advice and aid in our power for the due execution of the existing law.

Apart, however, from the questions as to the particular measures which the evidence rendered it our duty to recommend, we believe that compensation will be received for the time occupied, from the principles elicited or confirmed for the improved management of places of public interment, which will be available for the guidance of local authorities, as well as of those of our inspectors who have been engaged in the execution of the existing law.

We were further requested by the Secretary of State for the Home Department, to investigate and report on the whole subject of a more efficient and economical supply of water for the metropolis. In compliance with this direction, we endeavoured to devise a scheme which might supply the metropolis with pure, soft, spring water, instead of hard, polluted, river water; by constant instead of intermittent service, combined with works for carrying away waste water, and this at so reduced a cost that every house in the poorer districts might have its supply of water at a price not exceeding two pence per week. This has been effected for several towns, under the Public Health Act, and may be ultimately effected for all towns under that Act. We expressed our conviction, which we still retain, that there are no insuperable difficulties in the way of accomplishing the same results for the metropolis.—(See Reports and Minutes on new Sources of Water for the Metropolis, and new Modes for its Collection.—Also, App. No. 5 and No. 6.)

But for these extraordinary demands on our time and attention, we might now have had the satisfaction of reporting a greater number of towns in the enjoyment of the powers and privileges of the Public Health Act, and these in a state of greater forwardness with their works; yet, considering that the labour in which we have been

engaged is the first attempt to carry into practice a principle of legislation entirely novel, and that the staff of superintending inspectors to conduct the preliminary inquiries has never exceeded seven, and during the greater part of the time has been limited to five, we submit that as great a degree of progress has been made in the application of the Act as could have been reasonably anticipated.

We have now to state that 284 towns have memorialized and petitioned in form for the application of the Act. Of these, up to the 31st December 1853, the requisite forms and proceedings prescribed by the Act, have been complied with in 182, including nine in which the Act has been incorporated with local Acts, comprising altogether a total population, according to the census of 1851, of upwards of two millions—(2,100,000).

Within the last three months we have had petitions for the application of the Act from upwards of twenty towns.

Though, in many of the 182 towns, the application of the Act has been comparatively recent, yet, in one hundred and twenty-six cases, surveys with a view of carrying the Act into operation, have been completed or are in progress.

In seventy, plans of new works founded on the surveys have been laid out.

In thirty-one, including the cities of Gloucester, Salisbury, and Ely, and the towns of Dover, Preston, Lancaster, Penzance, Wigan, and Chelmsford, plans of combined works for water supply and drainage have been submitted to the Board for examination, and have been approved; mortgages of rates for the execution of these works have been sanctioned to the amount of upwards of 467,000*l.*, and the works are now, for the most part, in progress.

Besides the above sum for works entirely new, plans have been examined by the Board's inspectors for works of drainage to combine with waterworks already existing; for the extension of waterworks, and for other improvements contemplated by the Act, such as the paving and widening of streets, the opening of thoroughfares, the removal of obstructions to ventilation, &c. Plans, having reference to works of this description, have been examined and approved for thirty-nine towns; and sanctions for the execution of these plans have been given to the amount of 589,000*l.*, making a total sum, for which mortgages of rates have been sanctioned, of upwards of one million, viz. 1,056,000*l.*

In thirteen towns, including Rugby, Tottenham, Alnwick, Morpeth, Hitchin, Ormskirk, Barnard Castle, St. Thomas, Exeter, Ottery St. Mary, Ashby-de-la-Zouch, and Launceston, the whole of the public works for water supply and drainage are completed, and reported to be in full action; while the private portion, or that which connects the house drainage and water supply with the public works, is in rapid course of execution. With one exception (that of Croydon, to which we shall subsequently advert), these works are reported to be working satisfactorily:—that is to say, the main drainage works and the house drainage works, as far as they have been properly executed, are completely self-cleansing.

It is expected that in about thirty-five other towns combined public works will be completed, and in full action, in less than a year.

There will be further required an examination of surveys for fifty-seven towns, and of plans of works for one hundred and twelve towns.

Supposing the cost of the execution of such plans, after examination and approval, to be at the same rate as the cost for similar works in the thirty-one towns for which sanctions have already been given, according to the closest proximate estimate that can be formed, there will be required for the public works in these towns 3,643,156*l.*, and for their private works, at least 1,190,826*l.*, making altogether a total sum of 4,833,980*l.* The rise in the price of labour and materials since those sanctions were given, will, however, if they should continue at the present rates, augment the total expenditure to upwards of 6,000,000*l.*

This estimate has respect only to the sum which will probably be required for town and house drainage, and water supply; being, for water supply brought to every house, an average of a penny halfpenny ($1\frac{1}{2}d$) a house per week, and for main drainage or sewer drainage brought to the house, of 1*d.* per house per week. The average expense at which the works within the houses of the poorer classes have been executed under private improvement rates, for introducing a service pipe, putting down a sink, filling up the cesspool, and substituting a water-closet and self-cleansing house drains, and the construction of a dust bin, has been 1*d.* per week, being a total average cost of one halfpenny a day.

This amount does not include what may ultimately be found needful for collateral improvements, such as those already adverted to,—the formation of public walks, the

opening of spaces for light and air, and the widening of thoroughfares.

One of the most important practical results of the Act has been, the facility which it has afforded for its general adoption by the diminution of expense, in relation both to its application and to works executed under it.

The great diminution of expense in the application of the Act, has arisen from the improvements included in its form of procedure. The diminution of the expense of works has been effected by a closer examination of their nature, and by the appointment of a class of engineering inspectors, who having devoted exclusive attention to this description of works, have made themselves acquainted with their specialties, and have learned the most efficient and economical modes of executing them.

The Commissioners of Inquiry into the means of improving the Health of Towns, report that out of fifty towns that came under their notice, "in scarcely one could the drainage be pronounced good; whilst in seven it was indifferent, and in forty-two decidedly bad, particularly as regards the districts inhabited by the poorer classes."

With reference to works of sewage and drainage, they say "that enormous sums have been spent under legislative sanction for works which produced little or no equivalent benefit; that rate payers have been burthened with rates for works which positively aggravated the evils intended to be remedied, and that the expense and failure of such works form the main source of distrust and opposition to new works under ordinary local or representative responsibility."

With reference to works for the supply of water, they say "that out of fifty towns, in only six instances could the arrangements and supplies be deemed in any comprehensive sense good, while in thirteen they appear to be indifferent; in thirty-one so deficient as to be pronounced bad, and so far as yet examined frequently inferior in purity."

Yet, for works thus indifferent and inadequate, enormous compensations are often demanded, as a condition of allowing complete works under the Public Health Act to proceed, and of permitting the inhabitants to avail themselves of more wholesome and abundant supplies of water. Parliamentary sanction is commonly presented as the basis of the claims for compensation for such works, it being assumed that the preliminary examination of the plans by

committees was full and complete, and the sanction given to them given deliberately, so as to constitute a public responsibility for the private enterprise.

Moreover, amongst the outlays for such works treated as necessary investments of capital, are found heavy charges for obtaining the requisite powers, whether by private or by local Acts, amounting to sums which, properly applied, would have sufficed for the construction of a large proportion of the works required for the permanent improvement of the worst districts. In some instances, one-third of the permanent rates are required to defray legal and parliamentary expenses.

The works for the drainage of towns, were thus described in the first sanitary report:—

"The local reports abound with instances of expensive main drains, which, from ignorant construction as to the levels, do not perform their office, and do accumulate pestilential refuse; others which have proper levels, but from the want of proper supplies of water do not act; others which act only partially or by surface drainage, in consequence of the neglect of communication from the houses, but where the house drains do not act, or only act in spreading the surface of the matter from cesspools, and increasing the foetid exhalations therefrom, in consequence of the want of supplies of water; others, again, as in some of the best quarters of the metropolis, where the supplies of water are adequate, and where the drains act in the removal of refuse from the house, but where, from want of moderate scientific knowledge or care in their construction, each drain acts like the neck of a large retort, and serves to introduce into the houses the subtle gas which spreads disease from the accumulation in the sewers."

These defects were particularized in the first Report of the Commissioners for Inquiry into the means of improving the Health of Towns.

"Evidence," say the Commissioners, "has been produced before us, demonstrating that drains, when in other respects properly constructed, would confer little comparative benefit if no provision be made for the introduction of supplies of water sufficient to cleanse them. Instances are adduced where such drains have only extended existing evils.

"In districts in which both house and main drains exist,

“ or are in course of extension on an imperfect system, we
 “ have received strong evidence, showing that as these
 “ sewers and drains are so formed as to allow decom-
 “ posing refuse to accumulate, and to permit the escape
 “ of emanations into the street or houses, the inhabi-
 “ tants do not derive a benefit in proportion to the expense
 “ incurred.

The Commissioners then adduce the evidence of archi-
 tects and builders “ to show the evil effects that will ensue,
 “ unless the connexion of the internal works for a complete
 “ house drainage, and the works of external main drainage
 “ be made necessary and component parts of an efficient
 measure.

“ The medical witnesses have brought before us facts in
 “ support of their strongly urged and unanimous opinion
 “ that no population can be healthy which live amid cess-
 “ pools, or upon a soil permeated by decomposing animal
 “ or vegetable refuse, giving off impurities to the air in
 “ houses and streets.

“ They state the necessity of preventing all accumu-
 “ lations of stagnant refuse in or near houses, and of sub-
 “ stituting a system of house drainage and cleansing, aided
 “ by the introduction of better supplies of water into the
 “ houses. They have brought forward instances where the
 “ main drains and sewers were tolerably well formed, and
 “ subordinate or house drains attached, but where, from the
 “ want of properly-directed supplies of water, both house
 “ drains and sewers only acted as extended cesspools.”

The Commissioners assigned as general causes of the
 failure of local works, the want of a competent authority
 to communicate information to Local Boards, and of
 properly qualified local officers. They stated, as a result
 of all their local investigations, that “ an increasing opinion
 “ of the very special nature of the works under consider-
 “ ation, and of the special provisions required for their
 “ execution was manifested in several towns: where the
 “ present constituted authorities have fully and fairly
 “ entered into the consideration of the means of relief
 “ from the more pressing evils in question, they have con-
 “ cluded by avowing their conviction of the necessity of
 “ special and distinct administrative arrangements to
 “ provide for them.”

The further inquiries prosecuted in relation to the me-
 tropolis led to the same conclusion. Thus, the Metropolitan

Sanitary Commissioners in their first report declare—
 “ The more the investigation advances, the more is it
 “ apparent that the progressive improvement and proper
 “ execution of this class of public works, together with
 “ the appliances of hydraulic engineering, cannot be
 “ reasonably expected to be dealt with incidentally, or
 “ collaterally to ordinary occupations, or even to connected
 “ professional pursuits, but require a degree of special
 “ study, which not only places them beyond the sphere of
 “ the discussion of popular administrative bodies, but
 “ beyond that of ordinary professional engineering and
 “ architectural practice.

“ In justification of this conclusion, and to show the
 “ evil of the perverted application of names of high
 “ general professional authority, we might adduce examples
 “ of the most defective works which have received their
 “ sanction.

The sanitary report had stated, with respect to wasteful
 works—

“ All these local defects again are referred back to the
 “ defective construction of the Acts of Parliament, which
 “ generally either presume that no science—no skill—is
 “ requisite for the attainment of the objects, or presume
 “ both to be universal, which in some instances actually
 “ prohibit the only effectual mode of drainage, namely,
 “ that from the houses into the main drains; and in
 “ others, prescribe cleansing by house drains without
 “ supplies of water; or prescribe the construction of
 “ roads independently of drains, and direct the execution of
 “ only part of the necessary means, leaving other essential
 “ parts to the discretion of individuals.”

Under these circumstances, it appeared to us to be in-
 cumbent that strenuous efforts should be made, as we con-
 sider was intended by the Public Health Act, that the
 concession by the Legislature of the requisite local powers,
 should not be a licence for the repetition of previous waste
 and failure.

We have therefore endeavoured to complete what is
 practically a new system of sewerage, substituting for the
 former practice of laying down brick sewers in every street
 large enough for men to go up, a system of sewers
 graduated in size, each line being proportionate to the
 quantity of drainage to be provided for; so arranged
 as to concentrate and hasten the flow, instead of diffusing
 it over a wide surface, and thereby retarding it; imper-

meable, and therefore preventing the escape of the sewer fluid; self cleansing, instead of accumulating deposit, and consequently avoiding for the most part the necessity for flushing: a system which, as contrasted with the former, may be described as one of continuous flow instead of stagnation—one of immediate and constant removal of the refuse, instead of regular and progressive accumulation of it—and one, therefore, which fulfils the object of house and town drainage; whereas the former system did not accomplish that object, but on the contrary, by retaining the matter to be removed, allowing it to percolate into the subsoil, and placing it under conditions favourable to decomposition and exhalation, often increased the mischief it was intended to obviate.

In this system are further included arrangements for obtaining a more powerful and rapid discharge by better falls with shorter lengths, and at diminished cost, by the method of drainage at the backs instead of the fronts of houses.

With impermeable drains for the removal of town sewage, it was also necessary to combine permeable drains of the description used for agricultural purposes, in order to obviate the dampness arising from springs, or from the rain-fall over the uncovered portion of town areas.

With a new system of sewerage we have endeavoured to combine improved features in the system of water supply.

Up to the period of the sanitary inquiries just referred to, the prevalent practice was to take the nearest available supply, whether from rivers or wells, or to impound the most convenient surface flood water, the choice being usually determined, not after an extended search, and a chemical analysis of different waters, but by private interests in behalf of a particular source or mode of supply. To insure a better selection we have endeavoured to promote wider searches, and to include new sources and methods of collection, and have had careful analyses made, chiefly by Dr. Lyon Playfair.

Local Boards have generally concurred with us in avoiding river and flood water and surface washings for their supplies, and have also abandoned the practice of storing water in reservoirs, butts, and cisterns. They have for the most part sought perennial springs which yield soft water, though they may be situated at some distances from the towns. Supplies from such sources have been

obtained at Lancaster, Preston, Ormskirk, Hitchin, Barnard Castle, Knighton, Rotherham, and Launceston. These collections are commonly made by earthenware pipes, iron pipes being used in the lower districts, where the pressure is greater than the earthenware pipes manufactured in this country could bear. When necessary these collections may be aided by artificial or shallow spring collections. At Rugby, where there are no natural springs, a supply of excellent water is obtained by passing two miles and a half of nine inch earthenware drain pipes through a stratum of gravel. At Alnwick and Morpeth, also, supplies have been similarly obtained by tile drainage, after the manner of land drainage, the tiles being laid deeper. In some instances, as at Salisbury, Dover, Tottenham, Croydon, Epsom, and Selby, deep spring collection has been resorted to.

In general these collections are led into a reservoir or sump at the head of the main, so as to adjust the twenty-four hours' flow to the twelve or fourteen hours' delivery, which is constant and direct, the water being never stagnant or exposed to the light, but delivered fresh, cool, and fit for immediate drinking.

The supplies obtained by these new methods of collection, afford a demonstration of the practicability of supplying the metropolis, from the soft water springs of the Surrey Sands, with more than double the quantity of water at present consumed, and of a degree of purity entirely unknown to the population of London.

As a part of the system of combined works, we have endeavoured to connect it with plans for the application of sewer manure to agricultural production. The Local Boards are generally under difficulties, on account of their want of legal powers for carrying sewer pipes beyond their immediate jurisdiction, and of other facilities for the purpose; but it is reported that in ten towns examples of inoffensive and beneficial distribution by the method of flexible pipes and jets may be early anticipated—a mode of distribution which is already in successful practice on many farms.

We look forward with confidence to important results from successful examples of this new application of refuse which we believe will afford an increased stimulus to improved town drainage, and will exercise an important influence on the agriculture of the country, by greatly

augmenting the power of all its manures, while it will prevent the nuisances occasioned by their present waste.

We regret that in two instances the wasteful and objectionable method of distribution by water meadows has been resorted to.

As yet few Local Boards have been able to complete in a proper manner the surface paving of the streets within the towns, or to proceed with the improvement of the roads branching from the towns, commonly drained by open ditches; nor have they yet substituted covered agricultural drain pipes for open ditches, as recommended in the minutes of information on suburban land drainage. But it is reported that this method has been adopted in many instances with complete success by farmers and owners on their own lands. Its general application to suburban roads and byeways will be the means of greatly improving the drainage of contiguous private lands, as well as the sanitary condition of the uncovered suburbs of towns, more particularly the low lying and valley districts.

The chief results already obtained with reference to the diminution of expense are:

That four lower class houses may now be drained for the sum formerly charged for one.

That mains for sewerage and water may be laid on in nearly three districts at the former cost of one.

And that water, pure from its source in natural or artificial springs, may be conveyed into houses at an average of one-half the cost formerly incurred for its collection from rivers, and its storage in large uncovered reservoirs.

In almost every instance which has come within the knowledge of the Board, the contracts have been taken within the estimates, (allowance being made for the extraordinary alterations in the price of materials and service): a result which is, to a considerable extent, due to the provision of a proper survey in the first instance, on which the plans of new works are laid out in detail.

Though it is due to submit these general results as improvements already obtained, yet we believe that, with increasing experience and the continuance of the strict vigilance and scrutiny that have been exercised over plans of works, and sanctions of mortgages of rates for their execution, still further improvements may be effected.

The completion of all the new works has been impeded by the rise in price of materials and labour.

The works of several towns have been reported to be delayed by the difficulty of getting supplies of sewer and drain-pipes in sufficient quantity and of proper quality. But some judgment may be formed of the progress of the new works by the reported increased rates of the manufacture of these pipes. It is estimated that in the year 1848 there were manufactured of such pipes about 104 miles; in 1849, 416 miles; in 1850, 1,040 miles; in 1851, 1,820 miles; in 1852, 2,080 miles; in 1853, 2,600 miles; in all, as near as can be ascertained, about 8,000 miles. It is estimated that nearly one-third of the whole quantity was of the larger sizes required for sewers. On an average two miles of sewers in provincial towns serve for the sewage of the habitations of about one thousand of the population.

It appears from returns that in the metropolis between three and four hundred miles of public and private pipe sewers and drains have been laid down, and that nearly twenty-seven thousand houses have been drained with tubular drains.

The most important points of experience obtained from the extended voluntary use of sewers and drains of this material are,—

That properly adjusted tubular house drains combined with efficient water supply are, for the most part, self-cleansing.

That suitable mains, from the more concentrated flow in them, are self-cleansing in a still greater degree.

That this self-cleansing power is obtained with small falls, where continued accumulations would have been inevitable with the large and expensive works of the old construction.

And it is further shown that where the outfalls are tide-locked, pumping to maintain the self-cleansing power, by a continuous flow and constant discharge, is cheaper than the cost of constructing large reservoir sewers, and perpetually clearing away the foul deposit therein accumulated.

From the scarcity of careful and skilled labour available, there has been, perhaps, as much bad work in the new pipe drainage of houses and towns, as in the pipe drainage of agricultural lands. All deviations in the way of excess from the sizes recommended, have, however, been in diminution of their self-cleansing power, or have rendered necessary additional quantities of water for the fulfilment of their purpose. Instead of the failures having arisen from the sizes recommended being too small, they

have commonly arisen from the inlets being too large, or from the protections manifestly required having been culpably omitted. If, however, all the stoppages and obstructions which have occurred, instead of being caused by gross neglect, were absolutely inevitable and inherent in the new works, they would still be cheaper and better than the old. As compared with the expense of sewers requiring to be cleansed by hand labour, the saving by self-cleansing sewers would, as we have elsewhere shown (*vide Minutes on Town Drainage*, p. 133), pay for taking them up, and replacing them at the end of four or five years—in the case of the house drains within even a shorter period—while the occupiers would during their continuance enjoy an exemption from the noxious emanations arising from drains and sewers of deposit.

Such failures as those pointed out in the Report of the Commissioners for Improving the Health of Towns, had justified a presumption of the incompetency of municipal corporations and other local authorities to provide and maintain water supplies for towns; and it was urged by the promoters of trading companies that works of this description could only be cheaply executed as a matter of trade and private enterprise.

On an examination of the water works of trading companies, in the instances in which it has been necessary to acquire such works, and to adapt them to the new system of town drainage, no evidence has appeared of superiority in their efficiency, economy, or management, over those of municipal or other local bodies. As the object of these companies is profit, they are found to have generally limited their supply to the consumers who might be expected to yield it, namely the occupiers of the higher and middle class houses. Hence the frequent failure of their supplies when an attempt has been made to extend them to the whole population, and the necessity of application for authority to enlarge the works, by the expensive process of fresh private Acts. Being under the necessity of charging the expenses of their establishments on a limited and frequently for long periods on a small class of consumers, and also of charging for the interest of capital and expenditure during the period before the supplies are taken, they driven to impose high rates.

By procedure under the Public Health Act, an early and general extension of the works to the whole population of a town is practicable and necessary, and the risks

and losses of trading companies are avoided, so that Local Boards are enabled to afford the supplies at lower rates. Local authorities under the Public Health Act have recently supplied the poorest portion of the population of their district, as above stated, at a cost of less than $1\frac{3}{4}d.$ per week.

The total cost of such supply, which is generally constant and at high pressure, including the works within the house, namely, the service pipe, sinks, water-closet, and self-cleansing drains, does not exceed $2\frac{1}{2}d.$ per week, which is less than the existing charge for cleansing a cesspool, sinking a well, and keeping a pump in repair.

Capitalists have rarely undertaken works for what they deem complex objects, such as those of water supply combined with works of drainage, and the interests of trading companies or of their engineers are against the combination of works which may take the supply out of their hands, and put them into those of a public body.

If an unprejudiced examination of the new works be made, notwithstanding the imperfections that may yet attach to them, they will be found to exonerate municipal corporations and local administrative boards from the charge of incapacity made against them; to have improved the security for good local administration, and to demonstrate that such works may be obtained more efficiently and cheaply, including the proportion of establishment charges, under local public management, by payment for common and responsible service, than by the motive of a trading profit to be levied on individual necessities.

In several instances where water has been supplied by trading companies, for house service and drainage works, the separate management of such companies as commonly constituted, has been found to be so jarring and unsatisfactory as to confirm the previous objections to any separate service.

We are informed, from the United States, that the general tendency of experience there is in accordance with our own, as to the expediency of not leaving the necessities of the population, with reference to the supply of water, to the chances of trade, or to practical trading monopoly, but of resuming the public rights and duties in this respect, putting them under public and responsible management, and adapting payments to the cost of collection and distribution without any regard to trading profits.

One advantage arising in this country from the administration of such services by a public body for the public

benefit is, that it has secured a more ready co-operation for carrying out works of public utility than had heretofore been experienced. Thus in several towns, springs of water and facilities for its collection and distribution have been afforded by proprietors on liberal terms such as they could not have been expected to give to trading companies seeking their own profit.

In Hitchin, for example, F. P. Delme Radcliffe, Esq., has given to the Local Board a fine spring of water sufficient to supply the town, and has allowed the aqueduct main to be laid through his park, past his house, and on to the pumping engine.

At Morpeth, the Earl of Carlisle has given to the Local Board all springs rising in certain lands, as also the right to lay drains and aqueduct mains to collect water for the supply of the town.

At Alnwick, the Local Board tried, during the space of many months, to treat with the freemen of Alnwick for the right to collect water on Alnwick Moor. The proposed works must have given value to the land on the moor, as some 500 acres would have been deeply drained. The freemen, however, offered so many impediments to the proposed works, that the Local Board were compelled to abandon the scheme, after having expended several hundreds of pounds on trial drains and borings during the negotiations.

His Grace the Duke of Northumberland was then appealed to by the Local Board for leave to take the water of certain springs, some three miles distant from the town, and bring the same by an aqueduct main, contouring the intermediate land, also belonging to his Grace. The Duke at once assented, and has granted to the Local Board a lease of the springs and right of way, at a nominal rental of 1*l.* sterling per annum.

Prideaux Selby, Esq., has also conveyed to the Local Board of Alnwick land for a covered service reservoir, and offered other facilities.

At Croydon his Grace the Archbishop of Canterbury has given important facilities for the storage of water for the use of the inhabitants.

At Ormskirk, the Earl of Derby has granted a lease of certain lands and springs for water-works, on most favourable terms. These works are now in full use, and are most highly appreciated.

It would be difficult to estimate the money value of

these grants, freely made with a view to the improvement of the public health.

In some towns under the Act large proprietors have voluntarily requested Local Boards to carry out all the necessary private improvement works for the poorer tenements at their (the proprietors') own cost. In Alnwick the Duke of Northumberland, who is the owner of much house property within the town, has given such an order, and the same has been done in Morpeth by the Earl of Carlisle.

Three-fourths of the outlays for such new improvement works may be charged upon the owners. In these cases, however, the noblemen named pay the whole cost of the works.

The smaller owners are often only lessees, with very short interests in the premises requiring permanent works, and they are opposed to proceedings entailing the necessity of immediate outlays. There are inconveniences in the provisions of the statute charging the expense of works upon owners which we hope may be remedied. It is from the owners of small tenements that the most strenuous opposition to the Act has proceeded.

Where there are no trading or professional interests hostile to the Act, where house drainage and private improvement works are in operation upon properly distributed charges, the opposition to the extension of such works has been generally abated.

The apprehension of another visitation of cholera has hastened the adoption and preparation of plans for permanent works in many towns.

In the towns in which combined works have been completed, and many of the former sanitary evils remedied, there has been scarcely time for any very decided general results to have become manifest. But the abolition of cesspools, the removal of house-drains of deposit, and the substitution of the self-cleansing apparatus, has been gradually followed, first by the cessation of the sense of closeness and oppression formerly experienced on entering the houses of the labouring classes; next by the mitigation of headache and of symptoms of dyspepsia; and subsequently by the diminution of sickness and the prevention of an increase, if not an immediate diminution, of the rate of mortality.

The last two seasons have been peculiarly unfavourable, both to the execution of works and the development of their

beneficial effects. The heavy rains of the last and present year have, in many instances, put the immediate sites of towns in the condition of marshes. Where no surface paving has been completed, the wet and miry roads have aggravated the existing evils, and the defective conditions without have often been sufficient to counteract, for a time, much of the benefit of house drainage and of other improvements within the houses. That the inhabitants appreciate the new works, is, however, demonstrated by the fact that, after their completion in a few houses, they have been generally adopted voluntarily. The returns show that, on an average, in only 1 in 587 cases has it been found necessary to have recourse to compulsory process. Where instances have been favourable for definite observation, as in particular blocks of buildings, the effects of sanitary improvements have been already manifested to an extent greater than could have been anticipated, and than can be readily credited by those who have not paid attention to the subject.

In one favourable instance, that of the experience of between 600 and 700 persons of the working class in the metropolis, during the period of three years, the average rate of mortality has been reduced to between 13 and 14 in 1,000. In another instance, for a shorter period, among 500 persons, the mortality has been reduced so low even as 7 in 1,000, the average rate of mortality, for the whole of the metropolis, being 23 in 1,000.

In another instance, the abolition of cesspools, and their replacement by water-closets, together with the abolition of brick drains, and their replacement by impermeable and self-cleansing stone-ware pipes, have been attended with an immediate and extraordinary reduction of mortality.

Thus in a square, (Lambeth Square,) occupied by a superior class of operatives, in the receipt of high wages, the deaths, which in ordinary times were above the general average, or more than 30 in 1,000, had risen to a rate of 55 in 1,000. By the abolition of cesspools which were within the houses, and the substitution of water-closets, together with the introduction of tubular self-cleansing house drains, the mortality has been reduced to 13 in 1,000.

In the case of the model dwellings, it might be reasonably supposed that the decrease of mortality might, in part, be due to the improved habits of the occupants, whose superior intelligence would induce them to select

dwellings having good sanitary arrangements; but, in the instance just referred to, the reduction of the mortality was effected among precisely the same occupants, and without any change in their habits whatever.

Hitherto, when the subject of town drainage works has been considered, sewers for the removal of storm waters only, or the larger main sewers, have usually been taken into account, and exclusive attention has been given to their construction. When they were completed, it has been held, that the work of the public authorities was concluded, and the town drainage finished. It has been left to private individuals to make communications or not, as they might think fit, by private house-drains with the public sewers. Too frequently, however, they have been discouraged from doing so by the levy of a payment for the privilege.

We find that the injurious action of the causes of impurity upon the population exposed to them is as their proximity, no less than their intensity. As stated in the reports already referred to, until cesspools within houses are abolished, water-closets substituted, and self-cleansing house drains in action, main drains are of little use. Moreover, if but a small proportion of the sewerage which the main sewers are constructed to convey is brought into them, the stream, instead of being deep and rapid, will be shallow and slow, and consequently there will be the greater liability to deposit.

The experience of various places has clearly shown that main sewers alone, without systematized connexion with self-cleansing house-drainage works, are comparatively of little avail for sanitary purposes, even when they are not sewers of deposit. Thus it appears that at Liverpool, where extensive new sewers have been laid down, reported to be correct in principle and self-cleansing, the cesspools in houses being allowed to remain, and the house-drains continuing unimproved, the only reduction of the mortality effected has been from 31 in 1,000 to 29 in 1,000, even if that can be ascribed to the new sewers, and not to other improvements.

In the case of the square just referred to, when the cesspools and drains of deposit were removed, without any alteration whatever in the adjacent sewers, fever disappeared from house after house as these receptacles were filled up, and the water-closet apparatus substituted, merely in consequence of the removal of decomposing

matter from beneath the houses to a distant sewer of deposit, or to a common watercourse.

If the mortality were at the same rate as in the model dwellings, or in the improved dwellings in Lambeth Square, the annual deaths for the whole of the metropolis would be 25,000 less, and for the whole of England and Wales, 170,000 less than the actual deaths. If the reduced rate of mortality in these dwellings should continue, and there appears to be no reason to suppose that it will not, the extension to all towns of the improvements which have been effected in these buildings, would raise the average age at death to about forty-eight, instead of twenty-nine, the present average age at death of the inhabitants of towns in all England and Wales.

It may be objected that the field of observation in these examples is too narrow to justify the deduction of any general conclusion from them. The conclusions are, however, borne out by observations establishing variations in the amount of disease proportioned to variations in the extent of localizing causes, from which we can anticipate with tolerable accuracy the comparative rates of mortality among populations exposed to the influence of such causes. The individual facts above referred to are also reported to us upon careful observation, and a few such instances well observed are, as the framers of insurance tables are aware, more trustworthy than much greater numbers under varying conditions which admit of less exact observation. The facts in question are further confirmed by the results of growing improvements, in whatsoever steps improvements are attempted. They are confirmed, for example, by every month's experience of the working of the Common Lodging-houses Act, as well as by the longer experience of the almost total exemption from epidemic diseases of the inmates of new and well-regulated prisons, and of the susceptible inmates of new union houses. Nor is there any improbability in these results. The extension of the average term of life of the working classes to the age of forty-five or forty-eight is only bringing it up to the actual term attained by the middle classes. It is also to be observed in cases like that of Lambeth Square, that, great as the improvement is, it is obviously not so great as might be secured, since zymotic diseases still continue to occur there, apparently caused by the bad condition of localities in its immediate neighbourhood.

It is true that the total annual mortality of towns and districts ravaged by an extraordinary epidemic, is not always increased to the full amount of the numbers who thus perish, because many who are in this manner cut off suddenly would have been destroyed within the year by the slower operation of ordinary and more constantly recurring epidemics. By the last visitation of cholera, however, more than 40,000 (out of its 72,000 victims) deaths were added to the previous average death-rate. But these ordinary diseases are in themselves preventible, as is shown by the fact that they are for the most part banished from such establishments as those just referred to.

Our intervention has been continually besought by clergymen, medical practitioners, and others on behalf of the labouring population in villages, as well as towns, against ordinary epidemics, whose ravages are as great, and upon the whole greater, than those of extraordinary epidemics; but because the former are constantly present, and unattended by new and violent circumstances calculated to excite terror, no powers are provided for promptly and effectually dealing with them, the sums voted from the general local taxes for their relief having all reference, not to prevention, but to mitigation or cure.

Partly by the extraordinary mortality produced by these ordinary epidemics, and partly by the extraordinary amount of emigration which for some time past has been going on, there is at present in operation a two-fold drain upon the adult life and working ability of the country, to some consequences of which we now beg to call earnest attention.

The operation of excessive mortality caused by the frequent recurrence of ordinary epidemic diseases may be thus illustrated.

Excessive mortality prevalent in any town or district is preceded by excessive sickness, there being numerous cases of sickness to one death.

This wide-spread sickness, when not proving fatal in a few days or weeks, does so to a vast extent in the course of a few years, by producing slow disease in some vital organ, without leaving a single intervening day of real health or good working ability.

Even when such sickness is not sufficiently acute to produce organic disease, it causes a state of depression which renders the sufferers infirm and feeble, and unfit for hard labour. The evils, moral, social, and political,

resulting from the extensive prevalence of such a state of depression, are of greater magnitude even than those directly caused by the excess of rapidly fatal diseases.

But this state of depression is the normal condition of the great majority of the residents in all unhealthy districts and dwellings. The offspring of people in this enfeebled condition are puny and sickly; one half of the children they produce perish before they reach the fifth year of age; very few of those who survive attain a healthy, strong and vigorous manhood; the entire generation is swept away at the average age, for each individual, of twenty-nine years at most; the children born of this short-lived race are still more enfeebled than their parents, and the physical deterioration goes on increasing with each successive generation. The examination of the birth-places of residents in unhealthy districts demonstrate that the population of these localities could not be maintained, were it not for the immigration of robust labourers from less unhealthy and generally rural districts. On comparing the workmen born and bred in these unhealthy places with their parents who came from more healthy districts it is found that the descendants are lower in stature, less muscular, and less capable of labour. To such a degree does this deterioration shorten life, that in these districts it is difficult after a few years to trace the descendants of the original inhabitants.

There have been periods in the history of our own country when the like deterioration of the population has been produced by war. It is attested by statistical writers in France that the effect in recent times of the conscriptions from the adult population, to sustain the devastating wars of that nation, leaving at home only those who were incapable of military service, has been to reduce the stature and physical condition of the people to such a degree that it became absolutely necessary to lower the standard of height for recruits, which had been five feet four inches, to five feet one inch and a half.

But the physical deterioration caused by constant residence under unhealthy conditions is both more powerful and more constant than that produced by the most devastating wars.

The deaths from preventible diseases in England and Wales, from all causes and at all ages, are upwards of 170,000. The main bulk of this mortality takes place before the fifth year of age, and is produced either by

various forms of fever or by diseases of the respiratory organs; diseases which are controllable to a very great extent by proper sanitary arrangements. By far the larger proportion of those who survive the fifth year perish at the adult period of life; hence the constant excessive drain upon able-bodied life. It has been elsewhere shown that the ever active disease by which this mortality is produced is fever, and that the chief victims of this fatal malady are between the ages of fifteen and forty, the majority being between twenty and forty. One effect of this destruction of the heads of families, precisely at the time when they have the greatest number of young children to maintain, is, as has been often pointed out, to produce and keep up a state of pauperism; but it is also attended with this further evil, scarcely of less magnitude, namely, that it diminishes the natural proportion of adult persons among the working classes, and gives, on the one hand, an extraordinary preponderance of the young, and on the other of persons who have outlived the period of vigorous thought and action. The working ability of the population is thus diminished by an undue preponderance, at each extreme of life, of inefficient workers, and in the degree in which the natural proportion of the young is thus made to exceed that of the adult, the steadying principle of the community is lessened, the acquisition of productive skill is obstructed, the amount of instruction attained is abridged, the difficulty of extending moral culture and forming moral habits is increased, and instead of a population informed and sobered by knowledge and experience, there is substituted a population always young, inexperienced, ignorant, credulous, passionate, violent, and proportionably dangerous, with a perpetual tendency to moral as well as physical deterioration.

The new and extraordinary drain upon the stock of the physical strength of the nation by emigration, renders it the more important that every practicable measure should be adopted to stop the existing mortality at the adult period of life, and to render healthy and vigorous the rising generation of men and women who are to replace those who have left the country.

The new fields which have opened for labour and skill in our North American and other colonies, as well as in the United States, have already absorbed large numbers of the robust and enterprising of the adult population of our rural districts, the sources which have hitherto sup-

plied the waste of life caused by the excessive, and for the most part, preventible disease of towns. There is every appearance that the drain upon the strength and working ability of the country thus set up, will increase rather than diminish. It is guided and promoted by letters and pecuniary assistance sent by relations who have gone, to those who remain. It will probably be facilitated by the cheapening of transport, and by its increased comfort, speed, and safety. To the least ignorant and abject of the population, who now live in the filthy and crowded habitations of our neglected districts, and who see no prospect of improvements that are likely to reach them, the representation of wages to be obtained, higher than the highest town wages that can be looked for at home; the cheaper and better residence in an open country, and of land within the means of their own acquisition, must hold out a powerful temptation to try their fortune in a new sphere. In the mean time, as far as the effect of the emigration upon those who remain in unimproved localities and dwellings has yet been observed, increased wages bring only increased intemperance, which gives additional force to the noxious agencies by which they are surrounded. The last return of the Registrar General showed a marked diminution of the total amount of births, but if the average rate of births should be maintained, or even increased, it becomes a consideration of the greatest import how the social and economical consequences of the extraordinary drain upon adult life are to be counteracted. We believe this can only be done by removing from unhealthy districts the removeable causes of disease, and substituting the essential conditions of healthy existence.

We feel it to be our duty urgently to represent these circumstances as demanding early measures of co-extensive magnitude; for if the present rate of emigration continue, and the physical state of the population be not amended, both with respect to the duration of life and the physical strength of those that survive, we shall shortly be in actual want of able-bodied men, for the social, industrial, and military services of the country.

With reference to the money loss consequent on this state of things, on comparing the different rates of mortality in well conditioned and ill conditioned localities, it would appear that, taking into account the loss of labour, the expense of sickness, and the excess of funerals,

the total loss amounts to not less than 12,000,000*l.* per annum.

Now the chief preventive measures found on small scales to be productive of the most important results which have been hereinbefore stated, can be obtained, generally, only by public measures. The requisite improvements within houses, the abolition of cesspools, the introduction of adequate supplies of water, and the laying down of properly constructed self-cleansing house drains, adapted to a system of self-cleansing sewers,—it is, as a rule, wholly beyond the power of private persons, even of those in good circumstances, to effect for themselves. When the attempt has been successfully made by private persons, the expense has generally been more than double that of works systematized by a public board, and effected with the means and facilities afforded under the Public Health Act by “private improvement rates.”

We may confidently state further, that works of so special a nature as those for the new system of town drainage, for the new modes of collecting and distribution of water supplies, and for the new application of sewerage to agricultural production, cannot be reasonably expected to be carried into effect, efficiently and economically, by unaided local management. Although detailed instructions, such as engineers might act upon, have been extensively circulated, we are not aware of a single instance in which works of this nature have been effected, or are likely to be effected, excepting under the Public Health Act, and with such assistance as may be rendered by the General Board.

The extension of the Public Health Act to Scotland was barred by the passing of the Scotch Police and Improvement Act, which may be adopted by the vote of a majority of ratepayers, and which confers powers enabling towns to execute improvement works themselves. But it is reported to us that this Act has been adopted by hardly any towns in Scotland, so that, in general, these merely permissive powers are a dead letter, and even where town drainage works are attempted, they are of the character of the works so decidedly condemned by the Health of Towns Commissioners.

Recently, indeed, the errors which have been committed in some instances, have led the towns themselves to suggest the expediency of having examinations of works made while they are in progress by engineering

inspectors. We are fully aware that this would be a most important and economical arrangement.

On the other hand, large town districts afford examples of enormous expenditure for tunnel sewers, without any systematic provision for due supplies of water, or for connexion with self-cleansing house drains; sewers which are elongated cesspools, and which aggravate the evils intended to be remedied. The injury to the population, and the pecuniary waste of such works, is most grievous, and the example is obstructive to the extension of the Public Health Act.

Under the new and difficult circumstances in which we have been placed, with imperfect powers and active opposition, we have found it necessary to select towns for the application of the Act according to the apparent probability of local support, rather than the absolute necessity of the case as indicated by the rates of mortality. In districts which are the seats of the most devastating disease, no evidence has yet arisen to warrant the presumption that the most successful examples will lead to the spontaneous adoption of combined and efficient measures of prevention. Experience has shown that it is fallacious to conclude that all is well where there is no complaint. Among the population living in the lowest physical degradation, under circumstances which would be commonly deemed insupportable, we have met with scarcely one instance of complaint originating with the sufferers themselves; they are sunk too low to be conscious of their condition. It was noticed as a new and extraordinary occurrence, that on a recent inquiry working men came before the inspector to complain of the condition of their dwellings. Sometimes, indeed, women complain of the want of water, or of its excess in lower apartments, but they appear to be unaware of the effects of filth and overcrowding, as causes of mortal disease among their children.

Measures of improvement are locally advocated chiefly by medical men, clergymen, and home missionaries, who know the difference between the condition of the principal streets and thoroughfares of towns, and that of the quarters occupied by the poor, with respect to the state of which the middle class, and even local public authorities are in general entirely ignorant. Our inspectors are instructed to obtain from the local registrars a list of the chief seats of epidemic diseases in the towns they

visit, and to take with them, on their personal inspection of these places, the promoters of the inquiry, the local authorities, and especially the opponents of the Public Health Act. The common result is to elicit from those holding local position and office, an acknowledgment that they knew nothing of the real condition of their own town, as far at least as relates to those portions of it which are occupied by the majority of the inhabitants. The sight of these localities, appropriately termed "fever nests," has often stopped all further hostility to the Act, by converting opponents into advocates.

Towns, as well as classes, which are acquainted with no other standards of health than their own, are often no better informed on this subject than the poorest portion of the population. In Liverpool, one of the most prosperous as it is certainly one of the most unhealthy towns in the kingdom, the local belief was that it was among the most healthy. Recent inquiries had revealed the fact that in this town 30,000 persons lived in cellars. The statement was at first vehemently denied by the members of the Town Council, though, on an actual examination by the police, the number returned was 34,000. In Manchester also, the next in prosperity as in unhealthiness, where the deaths from preventible disease amounted to between two and three thousand annually, it was the belief even among medical men that the town was remarkably healthy, and this supposed state of high general health has been referred to in works of economical authority, as resulting from high wages and constant employment. It is not from within, but from without, that an approximation has been obtained to the true condition of the great mass of the population, and we are warranted by experience in stating that arrangements for the improvement of the public health, on any other basis than an aggressive one against the physical causes of disease, any assumption that the absence of complaint is proof of the absence of evil, will not only prevent the completion of what has been commenced, but will counteract much of what has been already effected.

We now beg to bring under notice some circumstances which have been made the subject of comment and censure both in and out of Parliament.

Objection has been taken to the method of applying the Public Health Act, either by Provisional Order confirmed

by Parliament, or by the more cheap and speedy method of an Order in Council. We submit that it is important that the real weight of any objections to these modes of carrying into effect economically, speedily, and efficiently, the improvements intended by the Legislature, should be investigated.

The great expense of Local Improvement Acts, amounting on an average to no less a sum than 1,627*l.* for each opposed Act, according to one return, or 2,000*l.* according to another, a cost which, in many instances, is a denial of the means of improvement, had been the subject of inquiry by Committees of the House of Commons, and had led the Legislature, before the passing of the Public Health Act, to consider some means of lessening this expense.

The preliminary inquiries, authorized by the Department of Woods and Forests, into the merit of proposed local improvement Acts, had this object.

The alteration originally intended was, that a public department should, upon petition, have the initiation of plans; but the procedure was so framed as not only not to give them such initiation, but to prevent the officers employed as inspectors from having the means of working out any plans, as alternatives or substitutes, or of entering into the examination of any such plans which might be proposed.

These officers had no proper *locus standi* provided for them before committees, which, it is stated, being anxious to shorten their labours as much as possible, in general heard only what they were obliged to hear, the case of the promoters. The opposition of the inspectors being of little avail when they disapproved, their approval was not deemed of value to compensate for the expense, in addition to the other expenses, which were undiminished. Nevertheless, enough was elicited to show that preliminary local inquiries might be made highly advantageous.

The average expense of these first local inquiries in 1847, appears to have been 165*l.*, comprehending generally only a part of the objects included in the Public Health Act; the further cost of printing the reports would probably have brought the total expenditure up to 200*l.*

The expense of the application of the Public Health Act, by order, which embodied comprehensive measures of local consolidation, has been on an average:—

For the provisional order, confirmed by Act of Parliament, including the engineering inspector's expenses, report and local publication	£	s.	d.
	136	1	2
For Orders in Council, including the engineering inspector's preliminary examination and report, &c.	88	2	0
General average -	£112	1	7

In two cases the combined works and comprehensive objects provided for under the Public Health Act, were sought to be obtained by Local Acts, and by ordinary professional assistance; one was for the town of Reading in Berkshire, and the other for the City of Dublin. Both were the subject of preliminary inquiries by the department of Woods and Forests.

The expense incurred for these inquiries was, for Reading 900*l.*, and for Dublin 800*l.*

We have no information as to the further cost of the bill for Dublin, but the total expense of the bill for Reading is stated to have been 8,000*l.*, and after all the bill was defeated by the opposition of a water company. Subsequently the Public Health Act was sought by petition of the inhabitants of Reading, and has been applied at a total expense of 140*l.* 19*s.* 3*d.*

The estimate of the cost of works for which the authority of the Local Act was sought, was 60,000*l.* The cost of more efficient works under the Public Health Act, is estimated at 25,000*l.*

In the instance of Carlisle, plans were obtained for works to be executed under the authority of a Local Act by an eminent railway engineer, who estimated the outlay required for street sewers at 70,000*l.* These would have been on the old system, and mostly sewers of deposit. Plans have been sanctioned under the Public Health Act for a complete set of self-cleansing sewers, for 23,000*l.*

The following are further examples of the relative cost of old and new works in the following fourteen towns. The amounts are given in round sums:—

Town.	Cost of Construction of Self-Cleansing Pipe Sewers.*			Cost of Construction of Sewers for Men to Cleanse.			Annual Instalment to pay off the Amount, with 4½ per cent. Interest in 30 Years.	
	£	s.	d.	£	s.	d.	To pay off Cost of Self-Cleansing Pipe Sewers.	To pay off Cost of Sewers for Men to Cleanse.
Rugby - - -	3,600	0	0	14,976	0	0	221	919
Woolwich - -	15,500	0	0	47,663	0	0	951	2,926
Croydon - - -	9,500	0	0	39,500	0	0	583	2,424
Tottenham - -	4,000	0	0	10,000	0	0	245	613
Ottery St. Mary	900	0	0	2,113	0	0	57	129
St. Thomas, Exeter - -	1,194	0	0	6,155	0	0	73	377
Barnard Castle -	1,800	0	0	3,709	0	0	114	227
Southampton -	26,063	16	3	53,713	7	0	1,600	3,297
Coventry - - -	17,500	0	0	36,065	0	0	1,074	2,214
Lancaster - - -	7,500	0	0	12,000	0	0	460	736
Ormskirk - - -	3,000	0	0	6,000	0	0	184	368
Hitchin - - -	3,300	0	0	7,000	0	0	202	429
Alnwick - - -	3,500	0	0	7,500	0	0	214	460
Morpeth - - -	1,500	0	0	3,000	0	0	92	184
Total Cost -	98,857	16	3	249,394	7	0	6,070	15,303
Average Cost of each Town }	7,061	5	5	17,813	17	7	£433 11 5	£1,093 1 5

* In several of the above towns some small brick sewers are included. In Southampton one district has been completed, with an area of about 47 acres, comprising 316 houses, and at a cost of 869*l.* for self-cleansing pipe sewers. The estimated cost for sewers for men to cleanse in this same district was £1,952.

While the smallest sized sewer proposed for streets in the Metropolis costs - - - - - 11*s.* 0*d.* per foot,
The average cost of the entire public drainage in Rugby, Tottenham, Barnard Castle, St. Thomas Exeter, and Ottery St. Mary, has been - 1*s.* 9*d.* per foot.

By the procedure under the Act, the following new and popular securities for publicity and economy are obtained :

1. More effectual local publication, by prescribed notices in local papers and otherwise, that the preliminary inquiry is about to take place.
2. Local examination by specially qualified and responsible engineering officers (*vide* Instructions in Appendix XI., p. 98.)
3. Local and public examination by and before rate-payers, and explanation to them of the objects aimed at and means intended to achieve them.

4. Local publication of the report as to the existing condition of the town, the new works proposed, and their probable expense.
5. A responsible Public Board for consideration of the proposed local measures, and as a court of appeal to private parties as respects certain classes of works.

With reference to provisional orders, it has been the practice of the Board to send the drafts of every order for examination to the town clerk, or other competent local officer, who usually consults a local committee as to the applicability and completeness of its provisions; and after the order has been agreed upon, signed, and sealed, it is published locally, that the ratepayers at large may have an opportunity of objecting to any of its provisions before it is confirmed by Parliament.

The general efficiency of the Act has, however, been materially circumscribed by the want of those supplementary powers which experience has shown to be requisite for the accomplishment of some of its minor objects, and the successive addition of which, as the proved necessity for them might arise, was, we believe, originally intended by the Legislature.

It was not deemed expedient to encumber the Act with working details, in the attempt to provide for everything that might be required, in all places and under all circumstances: it was thought more desirable to introduce, from time to time, such modifications and additions as experience might prove to be necessary into amending Acts. It was conceived in Parliament, that such amendments would be chiefly needed in the more populous districts, already provided with Local Acts; but petitions for the application of the Act have come to us in unexpected numbers from smaller towns, and even from villages which have no Local Acts or sanitary powers whatever, which could not afford the ordinary expense of Local Acts, and in parts of which the rate of mortality from defective sanitary arrangements is often higher even than in cities.

One of the main principles of the Act was to consolidate the various separate, independent, and conflicting establishments for executing and regulating public works, which could be efficiently and cheaply managed by one set of officers under one local administrative authority.

In the smaller towns it is only by the combination of works and service for paving, lighting, markets, roads, &c.,

that the works can be executed or superintended with the economy which is essential. It was intended that provisional orders should be in all respects new Local Acts, so framed as to include the whole of those objects; and it is expressly set forth by the 10th clause, with respect to places to which it is proposed to apply the Act, and within which there is no Local Act (inquiry into the state of burial grounds being provided for by sec. 8), that the Board shall make a provisional order under their hands and seal of office, "*With such provisions, regulations, conditions, and restrictions, with respect to the application and execution of this Act, or any part thereof, in all respects whatever, as they may think necessary, under all the circumstances of the case.*"

With the view of carrying into effect the intention of the Legislature in this respect, a clause was introduced, in the first confirming Act, to enable some Local Boards to meet the peculiar circumstances of their cases; to enable them, for example, to contract with companies for the supply of gas; but, subsequently, an objection was taken to the introduction of similar supplementary clauses until the general measure should be revised. One consequence of this decision has been that professional persons have taken advantage of the delay, since 1851, to multiply Local Acts, and so to frame them as to defeat the securities and objects intended by the Public Health Act. We might adduce several instances where Local Acts have been substituted for the Public Health Act, at a cost which would have paid for a large proportion of the chief works required.

In several instances, the inhabitants of towns for which Local Acts have been promoted, have petitioned the Board for protection against the waste to which they would be subjected by them, they themselves having no means to defray the expense of an opposition, whilst the attorney promoting such Act obtains power to levy the expenses of the Act from the rates. In two instances the representations of the Board have prevailed with committees; but in others, from want of means to bring up witnesses, and from having no *locus standi* in behalf of the inhabitants, the opposition failed. But the protection sought would have been rendered unnecessary if the supplementary powers in question had been granted; the omission of which forms the pretext for the Local Bill.

At Newcastle, the scene of the late attack of epidemic cholera, the introduction of the Public Health Act was resisted and prevented by means of a Local Act.

The introduction of the Act into Birmingham was frustrated by the substitution of a Local Act, at the cost, it is stated, of 10,000*l.* to the ratepayers.

Several other Local Acts, to the exclusion of the Public Health Act, have been recently promoted under similar circumstances.

The working of the Act has been impeded by the want of means on the part of the Board to send Superintending Inspectors to visit Local Boards, in order to aid them with such advice as their knowledge and experience might enable them to afford, and by the want of power to provide legal and binding forms and byelaws for facilitating the general working of the Act.

In consequence of these defects, local boards with new and special functions to exercise, (though the public cost to the state would have been trivial as compared with the money saved to the locality,) have not had those working aids which were afforded for constituting and assisting the first action of boards of guardians under the Poor Law Amendment Act.

Objection has been made in several instances that we have interfered unduly and unnecessarily with the proceedings of local boards.

It will be found, on the contrary, that the more general complaint has been that we have had no power to render local boards, new in office, and called upon to administer a measure of a new and special nature, the assistance which their position required. One ground of opposition to the control exercised under the Public Health Act has been, that it would lead to interference and increased expense. In every instance in which the General Board have deemed it their duty to withhold their sanction to plans of works proposed by Local Boards, it has been on the ground that the works in question were unnecessarily expensive.

We have received urgent representations as to the saving of time and expense, and the removal of doubt and difficulty, which would be effected, if the General Board were once for all to settle for Local Boards, among other matters, such as questions relating to surveys, to forms for keeping and auditing accounts, and to those for legal notices and their issue.

Under the impression that full provision had been made for rendering them such advice and assistance, we have received from Town Councils and Local Boards, twenty-four in number, including such towns and cities as York, Coventry, Dover, Gloucester, Southampton, and Salisbury, a request to name an engineer for planning out and taking the responsible superintendence of their works.

We have received from Hull, and ten other towns; requests to examine the qualifications of the persons selected by them as surveyors, or to advise as to the appointment of those officers. In twenty-five instances, local surveyors have been sent up, or have applied for instruction in laying out works, from the Board's chief engineer; and forty-four towns in all, have engaged the services of the Board's engineering inspectors for the preparation of plans and the general superintendence of their execution, making, together, sixty-nine towns in which local boards have voluntarily sought the assistance of the General Board's engineers.

Professional objections have been taken, particularly on the part of engineers, to the employment of the superintending inspectors under Local Boards.

Representations have been made to the effect that these officers have first been paid salaries by the General Board, and then have received payment for their services from local boards; but it is hardly necessary to state that the payment of the superintending inspectors is regulated by Parliament, which prescribes their rate of remuneration *per diem*, and declares that they shall receive payment under the Act only for the time during which they are on actual service, thus intentionally leaving them at liberty to take private practice. Their mode of remuneration is, therefore, in strict analogy with that of the inspectors under the Commons Inclosure and the Land Drainage Commissioners, and we apprehend this analogy was advisedly followed by the Legislature, it having been the intention of the framers of the Public Health Act to render the practice the same under both Acts. Under the Land Drainage Commission, the officer who reports at one time on the eligibility of drainage works for tracts of land, is commonly retained by private owners to plan the scheme of drainage, and superintend its execution; in which case, however, the Commissioners generally send another officer to examine and report on the works, who

is responsible for ascertaining that they are such as to justify the conditions of the mortgage.

In the present instance, however, the employment of the superintending inspectors appeared to be a matter of necessity. When application was made to us by Local Boards to recommend engineers to them, we apprehend it was simply because they were acquainted with no one on whom they could rely as having executed economically, and within the estimates, improved town drainage works, or as having afforded evidence of practical attention to the sanitary requirements of a population.

The assumption, founded on general qualifications, of fitness to execute these new and special works was proved to be fallacious. In recent instances, many large outlays had been incurred in the construction of tunnel sewers at extravagant cost, resulting only in extended cess-pools, and increasing the amount of noxious evaporation, such as may be smelt from the openings of the greater part of the sewers of the metropolis. What there was of old practice had to be unlearned. It may be said that the new system of combined works of house drains and sewers which are self-cleansing, and which remove all refuse before it can enter into decomposition, are as distinct from the old works, which detain and accumulate deposit, and require men to cleanse them, as old roads on the best engineering construction, differ from railways. Out of 140 persons who tendered plans for the drainage of the metropolis, there were only a very few who had had opportunities of studying the sanitary requirements of the population, and therefore who in any degree met them. The plans obtained by local boards upon advertisement or by competition, have been generally as unfortunate.

We should have been extremely glad if we could have seen in any general antecedent practice, evidence to justify us in recommending to local boards, in the first instance, persons unconnected with the General Board, but at that time we saw no such evidence. We could ill spare the superintending inspectors from their own official duties, and their partial withdrawal therefrom has necessarily occasioned delay in the execution of other pressing business. This inconvenience has, however, been attended with this compensation, that the inspectors have been obliged to master practical difficulties, and that successful examples of combined works may be early expected in upwards of forty towns. These examples, we confidently hope, will be

followed by independent private engineers, as has indeed been the case already in some instances, to which reference has been made in the Minutes of Instruction; and we consider it desirable that the inspectors should now be put upon the footing of inspectors to Poor Law Boards, and enabled to give their general and ordinary services gratuitously in aid of local boards.

It may be proper to observe here, that one of the chief sanitary defects in private and public works has arisen from the general want of attention, on the part of architects and engineers, to the effects of their arrangements upon health.

Though the emanations from sewers containing cesspool deposits are sometimes so intense as to produce suffocation, and their influence in causing fever and other forms of zymotic diseases is admitted, yet engineers of eminent name still contend for the construction of such sewers, and for the practice of employing men to go up them to cleanse them; while architects, not unfrequently, so arrange the drainage of houses as to bring extended cesspools immediately underneath living rooms. It has been one of the duties of the Board to urge the consideration of the effect upon the public health of the construction of public works, and to combine the services of medical with those of engineering inspectors. Though the means of the Board for effecting this combination of services have been inadequate, yet inspectors specially acquainted with the principles of sanitary science, are now engaged in tracing the effects of local arrangements upon health, and in examining the results of the new works completed or in progress. As far as the union of services has been tried, the result proves the necessity of making it more constant and intimate.

With reference to the inspectors under the Public Health Act, it must be further stated that several of the applications to the General Board to name engineers for planning and superintending local works, have come from Town Councils or Local Boards who had been hostile to the introduction of the Act, but who, on its application, have deemed it their duty to seek for what they conceived to be the most experienced assistance for its efficient and economical execution.

Statements have been made, and returns moved for, under an impression that our expenditure has been in excess of estimates. Had it been so, the unexpected and

extraordinary services already referred to might have accounted for and have justified some such excess.

But the following is a comparison of the actual expenditure, with the sums voted during our period of service:

	Voted.			Expended.		
	£	s.	d.	£	s.	d.
For year ending 30th September 1849 - - - - -	15,152	0	0	14,730	12	1
Year and six months ending 31st March 1851 - . - - -	20,700	0	0	18,928	10	11
Year ending 31st March 1852 -	9,969	0	0	9,278	14	1
Year ending 31st March 1853 -	10,745	0	0	11,748	1	9
Nine months, to 31st December, 1853* - - - - -	8,997	0	0	9,283	5	8
	65,563	0	0	63,969	4	6

The expense of the extraordinary services, not included in the estimates, amounts to about 8,000*l.*; still the votes, owing to economies in other matters, have been found more than sufficient to cover this unlooked-for expenditure.

Of the total sum voted, about 23,500*l.* will be repaid by Local Boards; the annual average ordinary expense therefore of the Board during its five years and three months of action, (an expenditure having for its object the saving of several millions now spent in the relief of preventible disease) has amounted to about 4,930*l.*

It has been further objected that we have incurred expenditure without the due and formal sanction of the Treasury. On one occasion we felt ourselves under the necessity of doing so. It was in 1849, during the height of epidemic cholera in the metropolis, when the deaths from this disease reached the alarming number of upwards of 2,000 weekly, and when the appointment of additional medical officers for arresting the progress of the pestilence had become most pressing.

Under these circumstances Lord Shaftesbury went over to the Treasury to explain the emergency, but found no principal member of the Government there. We then, on

* The vote for the year was 11,996*l.* The above sum of 8,997*l.* is the proportion of the vote to 31st December, 1853. Balance of votes over the expenditure and the liabilities was 443*l.* 15*s.* 6*d.*

our own responsibility, appointed the officers, and six weeks afterwards, in the usual course, we received their Lordships' sanction.

We have endeavoured to control our expenditure with an observance of the discretion usually exercised by Boards whose duties are restricted to the administration of ordinary civil business, and the temporary delay of which would entail no injury, suffering, or loss of life. But it is, as we have already shown, one peculiarity of the service in which we are engaged that, when epidemic disease breaks out, an occurrence which is usually sudden, there is not only a money loss by delay, but all delay is at the expense of pain, misery, and preventible death, and defeats the entire object of the administration.

For this reason we have been compelled, through the whole term of our service, to hold boards without intermission, irrespective of the usual vacations. The paid members of the Board have not intermitted their labour for a day, except on the occasion of severe illness, which has once happened to each. The table of attendances (*post*, p. 54,) will show how seldom also the unpaid member of the Board has been absent.

We are aware that, in the discharge of the duties which have devolved upon us, we have unavoidably interfered with powerful interests, which have the immediate means of making themselves heard by members of Government and of Parliament.

Provisional orders which supersede Local Acts have interfered extremely with the professional emoluments of parliamentary and other agents.

With preceding Commissioners of Inquiry we have been under the necessity of stating facts with relation to the inefficiency and waste of former works, and their effect in aggravating existing evil. These expositions, required for the protection of the public against the extension of like works, amounted to the condemnation of the professional practice concerned in them, and militated also against the interests of contractors for their maintenance and execution. Where large amounts of money had been invested in such works, as in those for the supply of water, and for cemeteries, the hostility of trading companies, of directors, and of shareholders has been induced, and their hostility, coming from persons holding a public position and whose direct interest was unexplained, appeared to have been based on public grounds.

The scheme we proposed for improved and economical extramural burial endangered the emoluments of cemetery companies and the entire body of trading undertakers.

The demands on their time and energy which, for the saving of life, we were obliged to make on boards of guardians during the prevalence of cholera, excited in numerous instances loud complaints. We have already stated the general and favourable change which has taken place in the opinion of boards of guardians and other local authorities with reference to our proceedings on that occasion.

The report in condemnation of the present sources and works for the supply of water to the metropolis, necessarily excited the hostility of existing water companies, as well as of those who were before Parliament with plans for the extension of similarly constructed works from similar sources.

The requisition in accordance with the Act and with the recommendations of the Commissioners for improving the Health of Towns, that surveys should be completed in detail before any new works were undertaken, scrutinies into the efficiency and economy of the plans for town drainage and water supply, caused the active hostility of professional engineers who were unaccustomed to such checks, and who were now called upon to change their principles and practice of construction, and at the same time to reduce in particular cases their emoluments, (always proportioned to the amount of expenditure,) to extents such as are set forth in the instances before given. (*Ante*, p. 40.)

These hostilities have been indicated both by the circulation throughout the country of misrepresentations of facts, and by suppression of facts, and in some instances, as has been already stated, by organized opposition.

To carry the provisions of the Public Health Act into extensive operation, the reduction of expense, as well as the improvement of works, was indispensable. It was foreseen that the attempt to reduce scales of charges and professional emoluments would be met by powerful opposition; that opposition has been encountered, and has been strengthened by the opposition of parliamentary agents and of others interested in the passing of local Acts.

The engineering opposition has been thus conducted. Instances of negligences and defects in the local execution of new works, causing partial failures in portions of them, have been collected, printed, and circulated, as exemplifying the operation of the system recommended by the General Board, and have been sent to all Local Boards.

Thus a group of common lodging-houses occupied by the lowest order of Irish, in some instances as many as forty in one house, was selected; and the facts of that single case propagated as the metropolitan experience of the "unsuccessful results of the system of pipe drainage;" the fact being kept back that only in a small proportion of the cases where water-closets and pipe drains had been laid down had there been any proper supply of water; while at the same time, in the metropolis, in a number of other blocks of buildings, and upwards of 20,000 single houses, the pipe drains were working satisfactorily; the demand for them increasing at a rate with which the manufacturers had difficulty in keeping pace.

Accounts of particular stoppages of pipe sewers were promulgated without any reference to the circumstances which showed that they might have been expected to stop; without any notice of the large proportion of good work executed where nothing of the kind had occurred, or any allusion to the expenses of cleansing, the failures, and the cost of maintenance, as well as the sanitary evils of the old works. At Croydon some of the works had been constructed on erroneous principles against express instructions, and had been carelessly and negligently executed, and the natural failure of such faulty works has been pertinaciously represented to be the failure of the system.

A proportion (about six per cent.) of the house-drains had been badly laid, chiefly by private bricklayers without superintendence. The inlets both to the house-drains and the public sewers had been left unguarded; stoppages had occurred, in the proportion of about one-sixth of a mile to seventeen miles of pipe sewage. These stoppages had been caused, not in consequence of the sewers being too small, but as appeared, on subsequent examination, from the inlets being too large. No provision in the specifications having been made for the thickness and strength of the pipes, the makers competed with each other in making them as thin as possible, and it is matter of surprise that there had been so little breakage, not amounting to more than one hundred and fifty yards in an unusually deep cutting. There being, in the then state of the market, no pipes readily obtainable which could be relied upon for the particular purpose, the expedient of a relieving arch of brick over the pipe was used for the length of the deep cutting. Notwithstanding the decisive proof of success with more than sixteen miles of sewer, state-

ments were promulgated that the system of works had proved a total failure, and that it had been necessary to return to the use of brick culverts on the old system. In spite of the fact, that with the exception of the stoppages in question, the whole of the pipe sewers in the streets were self-cleansing in an extraordinary and unexampled degree, and had never been half filled, conclusions were reported and promulgated, as from actual experience, that it had been found absolutely necessary to return to brick sewers of deposit, large enough for men to enter and cleanse away the accumulations of noxious deposit.

While the new works were in progress and approaching completion, an extraordinary epidemic which has prevailed in different parts of the country, in places where there are no new works whatsoever, attacked the higher class of houses in Croydon, those with old as well as those with new works. The disease was immediately ascribed to the operation of the new drainage works, although the first and most severe visitation of the epidemic was at the distance of upwards of three-quarters of a mile from the places where the works were going on. After the prevalence of the disease elsewhere had been shown, it was still alleged that the works at Croydon had aggravated it, notwithstanding the fact, that if the deaths had been in the same ratio as at Oxted, in the same county, which was deemed well situated, but undrained, they would have been one-third more numerous; or if they had been in the same proportion as at Sawbridgeworth, where the localizing causes were greater, they would have been more than doubled; or if they had been in the same rate as at Sheriff Hutton, where the localizing causes were still more aggravated, they would have been increased six-fold. The alleged causes of the epidemic at Croydon, the defective works, continued, but the disease itself has disappeared.

It was alleged that the works which were testified to have introduced good water, and to have removed foul smells from the poorest class of habitations, were a calamity; yet, such was the local appreciation of them, that the greater proportion were adopted voluntarily, and builders undertook, after hearing all that was promulgated against them, to pay the expense of the branch sewers themselves, that their houses might be connected with the system of tubular drainage out of their turn.

Some judgment may be formed of the ground of the opposition on the part of persons profiting by the preparation of private and local Acts, and by the works sanctioned

by them, when it is considered that, by the method of modifying and incorporating local Acts with provisional orders, between two and three hundred thousand pounds have been already saved to the local administration of the country, compared with what would have been the expense of private Acts.

According to the lowest return of the average expense of Local Improvement Acts, viz;—1,627*l.*, there will have been saved 214,000*l.* of expenses, or, according to another average, 380,000*l.* There is reason to believe that this is a low comparative average, inasmuch as the Local Acts referred to are usually for single objects, as for water alone, or for paving and lighting alone.

Extensive opposition has been raised to the application of the Public Health Act, and hostility created against the members of the Board, and the new works promoted by them, originating apparently in the view that there has been an interference with professional emoluments, to the extent of the clear reduction of these expenses, whereas the interference which would have been justifiable in every case, could really have extended to very few cases; for if the former rates of expense had continued, they would have operated as complete barriers to the improvement works now in progress under the Public Health Act, and in the great majority of instances, to any applications whatsoever to obtain legislative sanction in the usual form.

We may further state one illustrative example of the nature of the opposition we have encountered. Under the Nuisances' Removal and Diseases' Prevention Amendment Act, the scheme for a new cemetery cost 70*l.* instead of from 800*l.* to 2,000*l.*, which would have been spent in proceeding for a private Act. On this occasion, an intimation was received by our officers from parliamentary agents, that the course adopted by the board was an interference with their professional emoluments, which would render it necessary on their part to raise opposition against the continuance of the Board itself.

One course adopted by those who are interested in opposing the economies and securities afforded by the Public Health Act, is to recommend the substitution of a sanitary measure which shall be compulsory on all towns, without any provision or control with respect to the expenditure. This is the course of opposition selected by engineers. It is unnecessary to observe, that if this recommendation were adopted, it would increase the evil of wasteful and inefficient works, the burthen of which already presses

on many of the most important towns and districts so heavily as to occasion an insuperable obstacle, at least for the time, to urgently-needed improvements.

With respect to the important trust imposed upon us, of examining works before sanctioning mortgages of rates, in order to ensure that such works shall be of value equal to the outlay, for a period co-extensive with the term of the mortgages, it is to be observed that the practice of the Treasury has been to cause notice to be given in the locality that it was proposed to undertake such and such new works; and if no local objection were raised, to issue the consent. Information has been communicated to us respecting cases where consent has been given, under circumstances which prove the entire insufficiency of this procedure to insure the protection intended,—where, for instance, the towns-people have been wholly unaware of the nature and expense of the works in question which competent inquiry must have elicited. We are satisfied, from our experience, that the examination of plans for works ought to be extended rather than diminished, and both the responsibility under which it is done and the power of doing it increased.

Notwithstanding the obstruction to the working of the Act, we are aware of only six, out of 182 Local Boards, which are in a state of antagonism with the General Board.

Two of these hostile boards, under the influence of small owners of the description of property requiring amendment, manifested their determination not to execute the Act, by an attempt to dismiss their surveyors, with a view to the entire breaking up of the boards, an attempt which we were bound to resist, because we could not sanction the removal of those officers without just and legal cause. With reference to two other hostile boards, plans of works were proposed which we could not sanction, on the grounds that the works themselves were not the most efficient, and that they were unduly expensive. On our withholding our sanction to these works, the parties interested in them made loud complaints of uncalled-for interference. In another town, in which the engineer employed has been at variance with the General Board, it was found necessary, on examination of the proposed works, to insist on a reduction of 24 per cent. on the gross sum, for which the sanction for a mortgage of the rates was sought. The performance of this duty was followed on the part of the engineer and others by Parliamentary opposition and complaint.

We are aware of no instance in which we have experienced hostility, but on some similar ground.

With one or two exceptions, there has been, during the whole time of our service, a perfect unanimity of opinion and action among the members of the Board. Even with reference to the few questions on which we dissented from one of our presidents, had it been possible to bring under consideration all the evidence with which those members were familiar whose attendance at the Board was constant, we believe there would have been no difference of opinion, on the part of any Minister or Department, as to the practical course proper to be taken.

The following is a list of the attendances at the Board. It is necessary to explain, however, with reference to our first president, the Earl of Carlisle, that his attendance was much more frequent than is apparent from the subjoined table: for, when he was prevented by his other duties from being present at the regular meetings of the Board, scarcely a day passed in which he did not come to the office to inquire particularly into the day's business. The like attendance, especially in consultation on all important measures, which have been invariably reserved for him, has been given from the first by our unpaid member, the Earl of Shaftesbury, who, excepting when absent from town, has been daily present, even when his engagements prevented him from being at the Board at the hour when its meetings are ordinary held:

Year.	Number of Board Meetings.	NUMBER OF TIMES MEMBERS PRESENT.						
		Earl of Carlisle.	Lord Seymour.	Lord John Manners.	Sir William Molesworth.	Earl of Shaftesbury.	Edwin Chadwick, Esq., C.B.	Dr. Southwood Smith.
1848	74	3	"	"	"	22	71	71
1849	226	47	"	"	"	172	217	211
1850	216	8	4	"	"	147	214	162
1851	237	"	3	"	"	101	232	225
1852	247	"	"	8	"	79	247	246
1853	245	"	"	"	19	93	230	235
Total	1,245	58	7	8	19	614	1,211	1,150

A very large proportion of the correspondence of the Board has consisted in answers to applications for advice,

or for opinions on questions both legal and sanitary, directly or indirectly arising in the execution of the Public Health Act. Legal opinions alone, not far short of 2,000, have been given in answer to such questions, and the Board have reason to believe that much expense and litigation has thus been saved to Local Boards.

We have been frequently called upon to exercise an appellate jurisdiction upon appeals, besides those directly under the Act, such as the appeals from private individuals aggrieved by proceedings of Local Boards, with respect to the imposition of private improvement expenses. We have been called upon by minorities, as well as by private individuals, to exercise a voluntary jurisdiction by representations in their behalf with Local Boards with respect to the administration of other portions of the Act: we have been appealed to by the owners of water works against the proceedings of Local Boards; and by Local Boards for advice or for the aid of engineering inspectors against what they considered the undue exactions of trading water companies: we have been appealed to by one Local Board on cases arising out of the conflict of jurisdiction between that Local Board and another adjacent local authority: we have been appealed to by Local Boards to inquire into and arbitrate upon professional charges made against them, and on cases of disputes as to the remuneration of officers. We have also been appealed to by surveyors against Local Boards, and by Local Boards against surveyors. With such means as were in our power, chiefly upon the hearing of parties and reports of inspectors, we have endeavoured as far as practicable to satisfy these demands, which are increasing in frequency and importance.

We would now advert to the work which we have in a forward state of preparation, undertaken chiefly at the instance of Local Boards, as being requisite for the public service in protection of the public health.

Materials for a general Building Act, with a view to the prevention, as far as practicable, of the extension of the diseases attendant on bad sites and defective structural arrangements in town districts.

A Bill for the execution of important sanitary works in rural districts, in extension of the 50th section of the Public Health Act, which has hitherto been inoperative.

Information on the sanitary and economical construction of model lodging-houses and model dwellings for the use of Local Boards of Health.

Information on the paving and the construction and maintenance of roads.

Information on the collection and distribution of water for the use of towns, supplementary to the information already published on the drainage of the sites of towns, the drainage of houses, and the application of sewer water and refuse to agricultural production.

Information on the practice of quarantine, with relation to plague, completing the report on the three great epidemic diseases, cholera, yellow fever, and plague, the spread of which from country to country, and city to city, is commonly conceived to be controllable by quarantine.

The chief portions of the minutes of information on town drainage have been translated into French, and those on the application of town refuse as manures of towns into German, and they have also been adopted as text books for agricultural schools, and at the request of Sir John Burgoyne, the Inspector General of Fortifications, copies have been provided for the use of young engineers. From such cases we hope that the information will be found to be useful beyond the more immediate and particular objects of local administration.

In the preceding account we have confined ourselves to the submission of considerations which appeared to us to have an immediate bearing on the arrangements which are requisite for the completion of sanitary works in the towns already under the Act, and we have abstained from adverting to any provisions which would be desirable in the reconstitution of a General Board of Health.

In conclusion, we would submit for examination as due to ourselves, the state of the measures connected with the public health which were committed to our charge, and the manner in which they have been dealt with by us, amidst much difficulty and obstruction.

We venture to state that it will be found—

That no one measure has been left unadvanced, though the progress we have made has been effected with imperfect means, and against ignorance, prejudice, and very powerful adverse interests.

I.—That with regard to the extraordinary services required of us under the Diseases Prevention Act,—

We were called upon on first entering on our office to deal with a new and most formidable pestilence, the true character of which was then but little known, and respecting

whose mode of propagation erroneous and mischievous opinions generally prevailed.

That we laboured earnestly to correct those opinions, and particularly to call attention to the symptoms premonitory of an attack of the disease, to the localizing conditions on which its development depends, to the real safeguards against it, and to the most effectual means of checking its progress.

That the results of the preventive measures founded on these views, wherever the preventive system has been tried, have satisfied the medical authorities of this country, as well as the general body of medical practitioners, of their truth and practical importance, and we have reason to believe that these views are now acquiesced in by the Academy of Medicine of France, and by the chief medical authorities throughout Europe.

That from the more extended knowledge of these preventive measures, and their more cordial acceptance by local authorities than when they were first proposed in 1848, we have reason to hope that they will prove more efficient than they did then, should the return of the pestilence, which now again seems to be impending, call for their adoption.

II.—That we have entered into a laborious investigation of epidemic cholera, yellow fever, and plague, as far as these epidemics are connected with the subject of quarantine. The conclusions we presented in our reports in reference especially to the two first of these diseases have received the general assent of the medical delegates assembled at Paris, at the instance of the French government, from the chief states of Europe; an acquiescence which we hope will lead to a general reform of the present practice of quarantine.

III.—That we have examined the practice of interment abroad, as well as in this country, and have in our reports set forth the principles which, it appears to us, should be kept in view in carrying into effect an improved system of extramural sepulture; principles which, in the main, are now recognised and in course of adoption.

IV.—With reference to our ordinary duties in the execution of the Public Health Act, it will be found,

That we have laid the foundation of measures of tried efficiency against the visitation of ordinary epidemic diseases, and have proved the practicability of a great reduction in the average amount of disease and mortality

prevalent amongst the labouring classes, and of a considerable extension of the duration of their lives, and the periods of their working ability.

V.—That we have put in course of practical execution the main conclusions sanctioned by the Commissioners of Inquiry into the means of improving the Health of Towns, and embodied in the Public Health Act.

In prosecuting this purpose we have checked wasteful outlays, which frequently only aggravated existing evils, and put in course of extensive and successful practice permanent works for an improved water supply, combined with those for an improved system of self-cleansing town drainage, together with those for paving and flagging, under one and the same local management; yet subject to such general control as has been deemed by the Legislature necessary to check wasteful expenditure, and to give due protection to minorities and unrepresented persons.

With reference to the improvements introduced into the supply of water, they consist chiefly in its collection from natural or artificial shallow springs, and in its delivery direct from its source so as to need no filtration; dispensing with cisterns, and, wheresoever practicable, avoiding storage in uncovered reservoirs, and finally distributing it in a fresh and pure condition to the lower class of houses at a cost not exceeding one penny, or on an average one penny half-penny per week per house. (*See* Conclusions of Report on Supply of Water to the Metropolis, and table of returns in relation to the new water-works provided. App. Nos. 5 and 6.)

We have promoted the introduction of systematic works for the constant removal of house and town refuse before it can enter into decomposition, and at from one-third to one-fourth the expense hitherto incurred for the construction and cleansing of cesspools, house drains and sewers of deposit, that aggravate the evils which proper works should remedy. (*See* Conclusions from Minutes of Information on the Drainage of Houses and Towns, circulated for the use of Local Boards, App. No. 7.)

We have promoted the application of improved measures for the drainage of the uncovered, or suburban portions of the area under the jurisdiction of Local Boards of health, in such a manner as to give greater facilities for private land drainage. (*Vide* Conclusions in Minutes of Information on Suburban Land Drainage, App. No. 8).

We have provided for the systematic application of the sewerage of towns to agricultural production, by improved methods of pipe distribution; obviating the sanitary evils, and avoiding the waste of distribution by water meadows; improved methods which are in course of voluntary adoption by scientific agriculturists for the distribution of farm yard manures. (*See* Conclusions from the Minutes of Information on the Application of the Sewerage of towns to Agricultural Production, App. No. 9.)

VI.—For the promotion of the objects of the Public Health Act, we have selected engineering officers of special qualifications, (*vide* App. No. 10, on Tests for Examination as to Qualification,) and given them special instructions. The specially qualified services of these officers have been available for other public departments. (*See* Instructional Letter for the Examination of Candidates, App. No. 11.)

VII.—The confidence placed in the Board is indicated by the fact that they have been requested by thirty Town Councils, or Local Boards, to name engineers for the execution of their local works; by eleven others to examine the qualification of candidates for town surveyorship, and by several more to provide local officers, and fix the salaries which should be given to them, and to arbitrate on various questions in dispute.

VIII.—The improved form of Local Acts by provisional orders, is applicable to large classes of Local Private Acts, and effected at from one tenth to one twentieth the expense heretofore incurred for them.

IX.—In consequence of thus cheapening and facilitating the procedure for obtaining legislative sanction, out of two hundred and eighty-four petitions, the total number received for the application of the Public Health Act, measures for the consolidation of old works, or the erection of new ones, contemplated by the Act, have been applied to one hundred and eighty-two cities, towns, and places, comprehending more than two millions of town population. New surveys are completed in one hundred and twenty-six of the places to which the Act has been applied plans have been examined and sanctioned for sixty others which are in course of execution, and works have been completed in thirteen. In forty other towns and places proceedings are in due course upon petition for the application of the Act, twenty-two of such petitions having been presented since September last (to Dec. 31, 1853).

X.—In consequence of the administrative improvements effected under the Public Health Act, public works have been executed by local authorities, more efficiently and economically, as well as more responsibly and satisfactorily to the public, than had heretofore been done by uncontrolled local authorities, or by trading companies.

This has been effected by keeping in view what is deemed the proper position and principle of action of a General Board :—

“First, as a responsible agency for the removal of those evils in the repression of which the public at large have an interest.

“Next, as an authority for appeal in disputes between conflicting local interests.

“Thirdly, as a security for the due distribution of local charges, for the protection of minorities and absentees, against wasteful works, or undue charges ; and—

“Fourthly, as a means of communicating to each locality, for its guidance, the principles deduced from the experience of all other places from which information may be obtainable.”

Experience has shown, particularly that of recent occurrences at Luton, Newcastle, Gateshead, and Merthyr Tydvil, that large majorities of the labouring classes being weekly occupiers, and unrepresented, and having, therefore, no direct influence on local authorities charged with the execution of preventive measures, even when they have votes, from their state of ignorance are easily misled as to their own interests ; circumstances which give this class the strongest claim to an appeal to a body capable of affording them the protection intended by the Act, and invested with full and responsible powers for affording such protection.

XI.—We have so promoted the execution of permanent works, to be defrayed by payments distributed over periods of time, as to prevent the injustice and inconvenience to large classes, occasioned by the execution of such works by immediate levies ; but,—

The successful completion of the works already commenced, and of those in preparation, and further improvements in this new and untrodden field of public administration, will depend on the security taken for the strict and responsible performance of this branch of service, by competent, sustained and zealous attention, in ensuring efficiency and preventing waste.

On the successful completion and action of the works, in the places to which the Public Health Act is already applied, will mainly depend its extension to other towns and cities, and its adoption in other parts of the kingdom.

We trust that on a due examination of the extent of business transacted, (including that prepared, but the execution of which has been delayed or prevented,) and on consideration of the cost incurred, it will be found that in economy and efficiency what we have done will bear comparison with the transaction of business in private professions and trades. (*See Return of the Amount of Business transacted and the Total Annual Expense, App. No. 12.*)

With reference to the Nuisances Removal and Diseases Prevention Act, the alterations required to render it efficient were submitted immediately after the termination of the last epidemic, chiefly at the instance of local authorities, and a promise was made that amendments should be proposed.

It was however then anticipated by some, that epidemic cholera had disappeared for another term of years as large as that which intervened between the preceding visitations ; but the increased frequency of its recurrence at its sources in India, and its devastations in Persia, Russia, and Poland, forbade that expectation on our part, and the circumstances under which it has now reappeared, warrant the belief that the infliction will be renewed with greater severity and probably with greater frequency.

For such emergencies, and still more to meet the ravages of common epidemics,—against which house-to-house visitation, and prompt treatment of the early symptoms promise to be as efficacious as against cholera—the application of the powers of the Act immediately on the appearance of the disease, is absolutely necessary without the intervention of any other forms than the proof of the reality of the attack.

The Public Health Act gives power to Local Boards to compel owners to supply houses with water, where it may be done for a rate not exceeding two-pence per week. They have also the power to compel house drains to be made, and to order the removal of cesspools. But it has been found that the exercise of the power for the removal of these sources of disease is, in the worst cases, often effectually obstructed by the lowest class of landlords.

The officers of Local Boards, and many Local Boards themselves would now be prepared for the exercise of a compulsory power by the General Board in such cases; which would meet with little resistance if the provision of proper self-cleansing house drains could be carried into effect, as it certainly might, at a rate not exceeding the water rate; namely, two-pence per week.

The other powers needed under the Public Health Act, the particulars of which have been elsewhere submitted, relate chiefly to the working clauses, and consist for the most part of additional powers of action for local boards. Among such additional provisions, the most important for many of the new boards would be the powers required for the collection of springs of water for the public water supply beyond the jurisdiction of local boards; and also facilities for the application of sewerage manure to lands.

We anticipate that when the works now in progress for combined water supply and drainage, and for the application of refuse to agricultural purposes, shall have been completed, which may be confidently anticipated with respect to about fifty towns in the course of a year, or a year and a half, the trained service now organized, as well as the functions of the Board itself, will admit of considerable change.

But what we apprehend requires for the present to be most anxiously guarded against is the interruption of the works now in course of completion; the inadvertent omission of parts essential to the working of the combined whole; the neglect of the evidence which the more advanced works are now beginning to afford of the diminution of the entire class of epidemic diseases, proportioned to the removal of their localizing causes; the rendering useless correct and efficient plans already prepared; and the greater or less waste in an amount of public expenditure which cannot be estimated at less than four millions and a half.

We beg further to express our conviction that the information which we have been enabled to diffuse respecting the principles and objects of the Public Health Act, and the evidence on which its provisions and anticipations are founded, has produced among local authorities a growing sense of its importance as the great means of effecting the sanitary improvement of the country. We deem it highly satisfactory that it has been so seldom necessary to use the compulsory powers of the Act. In

whatever we have ourselves ventured to recommend, we have studiously endeavoured to carry the convictions of Local Boards with us; and, except in the instances above stated and explained, we hope we have been successful. We have reason to believe that many large towns and cities, not yet under the Act, are watching, with immediate reference to their own course of proceeding, the results of the measures which are now coming into operation. We know that the efforts made in this country to improve the sanitary condition of the great masses of the people, have attracted the earnest attention of other countries. Our published reports have been translated and widely circulated on the Continent; commissioners have been sent to us to make inquiries into the whole of the circumstances connected with the works in progress, and their prospective results, for the information of the Governments of France, Belgium, Denmark and Sweden. Our proceedings have engaged the attention of the Piedmontese Government and the municipality of Turin. We have also received official communications from Warsaw, Berlin, Vienna, and several of the American States, as well as from the West India Colonies, and we feel assured that on the legislative measures which may be taken in the present stage of the working of the Public Health Act, to amend its defects and to confirm its powers, will mainly depend the further progress of Sanitary Reform, and the removal of the great and admitted evils which result from its neglect.

We have the honour to be,

My Lord,

Your Lordship's

Most obedient servants,

SHAFTESBURY,

EDWIN CHADWICK,

T. SOUTHWOOD SMITH.

The Right Honourable

Viscount Palmerston, G.C.B., M.P.,

&c. &c. &c.