Report to the General Board of Health on a preliminary inquiry into the sewerage, drainage, and supply of water, and the sanitary condition of the inhabitants of the township of Elland-cum-Greetland, in the county of York / by William Ranger, Superintending Inspector.

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PUBLIC HEALTH ACT

(11 & 12 Vict. Cap. 63.)

REPORT

TO THE

GENERAL BOARD OF HEALTH

ON A

PRELIMINARY INQUIRY

INTO THE SEWERAGE, DRAINAGE, AND SUPPLY OF WATER, AND THE SANITARY CONDITION OF THE INHABITANTS

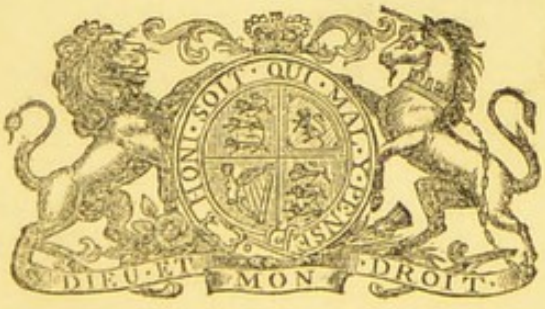
OF THE TOWNSHIP OF

ELLAND-CUM-GREETLAND,

IN THE COUNTY OF YORK.

BY WILLIAM RANGER, ESQ.,

SUPERINTENDING INSPECTOR.



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FOR HER MAJESTY'S STATIONERY OFFICE.

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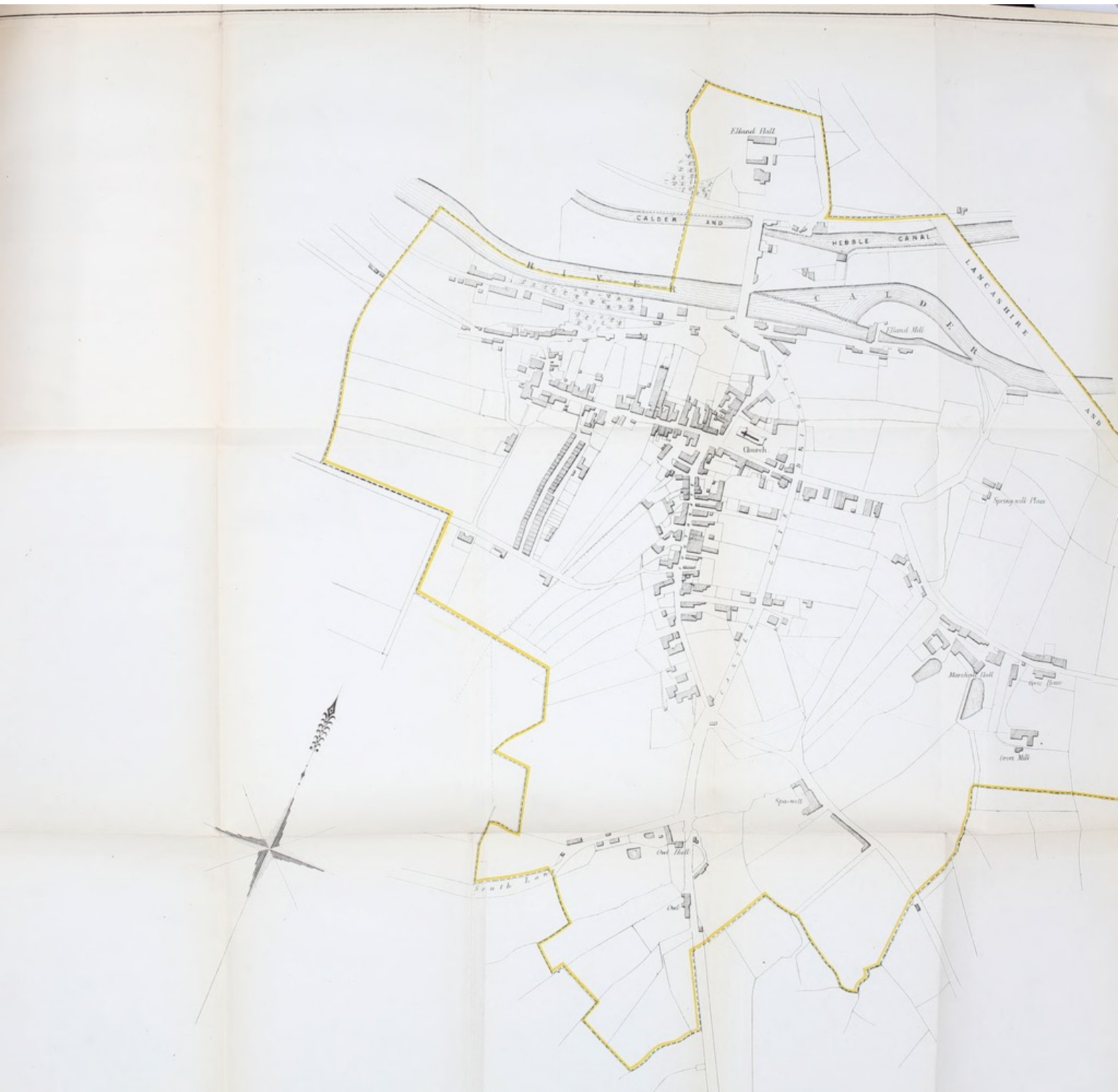
28 1851.

NOTIFICATION.

THE General Board of Health hereby give notice, in terms of section 9th of the Public Health Act, that on or before the 20th day of December next, being a period of not less than one month from the date of the publication and deposit hereof, written statements may be forwarded to the Board with respect to any matter contained in or omitted from the accompanying Report on a preliminary Inquiry into the Sewerage, Drainage, and Supply of Water, and the Sanitary Condition of the Inhabitants of the Township of ELLAND-CUM-GREETLAND, in the County of York; or with respect to any amendment to be proposed therein.

By order of the Board,
HENRY AUSTIN, *Secretary.*

Whitehall, 1*st November* 1851.


Elland Hall
CALDER AND
HEBBLE CANAL
LANCASHIRE AND
R I V E R
C A L D E R
Elland Mill
Church
Springwell Place
Marshyate Hall
Spa-well
Old Hall
South Lane

Owl Hall
South Lane
Owl

PLAN

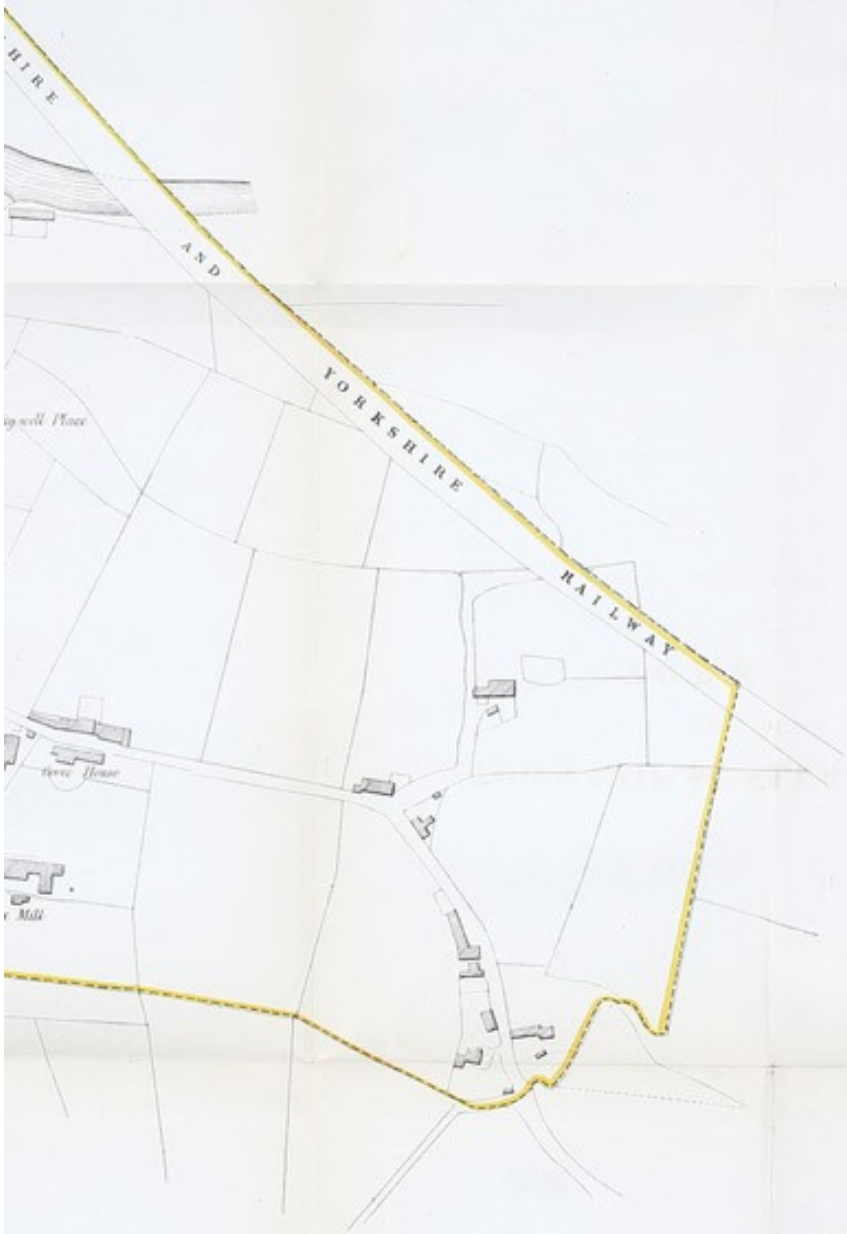
OF THE

TOWNSHIP OF ELLAND

in the County of

YORK.

The Yellow Line marks the Boundary of the proposed District.



SCALE

INDEX.

PUBLIC HEALTH ACT (11 & 12 Vict. c. 63.)

Report to the General Board of Health on a Preliminary Inquiry into the Sewerage, Drainage, and Supply of Water, and the Sanitary Condition of the Inhabitants of the Township of ELLAND-CUM-GREETLAND, *in the County of York.* By WILLIAM RANGER, Esq., Superintending Inspector.

2 A, *Pall Mall, London, July 25th*, 1851.

MY LORDS AND GENTLEMEN,

I HAVE the honour to lay before you the following Report on the sanitary condition of the township of Elland-cum-Greetland, at which place I instituted a Preliminary Inquiry on the 30th of April and the 1st of May last, public notice of the same having been previously given in the prescribed form.

The petition for the inquiry was numerously and respectably signed, the names of 246 ratepayers being attached to it—a number considerably higher than that required by the Public Health Act.

Before entering on the more immediate object of my Report, I may premise that the inhabitants of Elland have for some time past had their attention directed to the state of the district, and various attempts have from time to time been made to improve its sanitary condition.

It was thought by some that they would most easily gain the desired end by means of a Local Improvement Act, and the preparatory steps for procuring one had been already made when it was proposed that a petition should be presented to your Honourable Board, requesting that a Superintending Inspector might be appointed to institute a preliminary inquiry.

In consequence of this the promoters of the Local Act abandoned their intention, and expressed their readiness to co-operate in the improvement of the town under the provisions of the Public Health Act.

A list of the persons who were present during the inquiry, and the whole of the evidence which I received whilst conducting it, are given in the Appendix.

General Description.—The township of Elland-cum-Greetland, though now a comparatively small place, was formerly of considerable importance, for in the early part of the fourteenth century it possessed a weekly market and two annual fairs. For many years indeed it was the only chartered market town in the neighbourhood, and possessed in addition a cloth hall of its own. At this period it was a more important place than Halifax, from which it is only about three miles distant. Worsted spinning and the manufacture of coarse woollen cloths are the chief branches of industry; there are also some collieries in the district, and a portion of the people are occupied in the manufacture of earthenware. The chapelry contains about 3,388 acres.

The population of the township, which in 1841 was 6,465, is now 7,210, so that there has been an increase of 745 persons within the last ten years. The annual value of the rateable property is 18,000*l.*

The amount expended in the relief of the poor is, I am happy to say, considerably less than it was some years ago. In March last, 118 persons only were receiving parish relief, which was 34 less than at the same period of the preceding year.

The average amount of poors rate for the last six years has been 1*s.* 9*d.* in the pound for Elland-cum-Greetland, and 1*s.* 2*d.* in the pound for Elland only.

The expenditure on the turnpikes and highways in Elland-cum-Greetland amounted to 948*l.* 14*s.* 10*d.*; the annual average outlay for the last six years being 1,043*l.* 3*s.* 2*d.* There are 10 miles of turnpike, and 12 of highways in the township, which are kept in repair by the highway board.

Local Government.—Elland has no local form of government or any local act for the regulation or sanitary improvement of the district. The township is included within the Halifax Poor Law Union; the superintendence and repair of the roads and streets being in the hands of the highway surveyors, who also look to the sweeping of the town, and to such partial scavenging as is now practised.

Personal Inspection of the District.—A considerable portion of each of the days during which I was at Elland was spent in a personal inspection of the different parts of the town, more particularly of those quarters which were

represented by the witnesses to be the most unhealthy and to chiefly stand in need of improvement.

In the present instance it could serve no useful purpose were I to specify by name each particular lane or court whose condition was unhealthy. I merely give therefore one general description, and leave the more detailed statements to witnesses whose residence in the immediate vicinity of the unhealthy quarters of the district must make them better acquainted with their condition than a stranger possibly can be.

I may premise that the general condition of the dwellings of the poorer classes is much the same as in other towns in the same neighbourhood, where I have recently held inquiries under the Public Health Act.

Elland fortunately enjoys some immunities, but on the whole the poorer quarters of the town are capable of great improvement. In many places of this character I found the houses overcrowded, and in numerous instances the parents and a large family of children compelled to live, eat, and sleep in one room, and that of no very large dimensions. To the general evils of overcrowding within, may be added those existing without the houses, in the shape of streets, roads, and yards, with their surface either entirely unpaved, or so broken up and uneven as to permit large and constant accumulations of liquid refuse. This nuisance is of more formidable extent, as there are no existing authorities responsible for a general or systematic plan of scavenging. It is true that large dunghills are provided for the general use of a particular street or court, and the contents removed when the middensteads are filled to overflowing; but before this is done decomposition has begun, and the refuse has passed into the stage in which it is chiefly prejudicial to the health of those residing within reach of its poisonous influence.

The medical men, to whom I am indebted for much valuable information and assistance, and whose evidence is given in the Appendix, all bear witness to the close and intimate connexion between a low state of health and a neglect of sanitary precautions. Even those gentlemen, who dwell more particularly on the generally healthy condition of Elland, have admitted that there are portions of it where the standard of health is far below the average of that of the better built portions of the town. Mr. *Slater* and Mr. *Hiley* both point out the sure and certain way in which defective drainage and ventilation and overcrowded dwellings produce typhus fever and other epidemic diseases of the most fatal and virulent nature.

Mr. *Hiley's* written statement is as follows :—

"On referring to my Medical Report Book I find that the average number of pauper cases of sickness, occurring yearly in Elland-cum-Greetland District, are seldom fewer than 300, and that a considerable proportion of this number happen in those localities in the town of Elland itself, particularized in the medical evidence as unhealthy. I have frequently noticed, during my professional career in Elland, that fevers, and other infectious diseases, first make their appearance, continue for the longest period of time, and are accompanied with the greatest amount of mortality, in the above unhealthy parts of the town."

In commenting on this portion of the evidence I ought not to pass over without notice the statement of more than one of the medical men as to the beneficial effect produced by putting the Nuisances Removal Act into operation in the case of some of the worst nuisances in the place.

Now it is most true that this Act is beneficial for the cure of any single nuisance, which, once removed, is never likely to occur again; but it is powerless and inapplicable to remedy those evils which exist in every place in need of sanitary reform and regulation. By its aid an offensive middenstead or stagnant ditch may be emptied, but it does nothing to prevent a recurrence of the same evil, which is unavoidable in the vicinity of undrained dwellings and unsewered streets.

In proof of the above assertion I would refer to the written statement of the Inspector of Nuisances, who, after speaking of the proceedings that have been taken under the Act, remarks,—

"I find upon inspection that the back part of New-street, Elland, is in a very deplorable state for the want of drainage; so much so, that the health of the persons living in the neighbourhood will be endangered unless there be some steps taken to remove the nuisance complained of."

I need hardly say, that under the Nuisances Removal Act there are no provisions for executing such works as drainage or sewerage in undrained localities, however necessary they may be to the health of the residents.

The same witness, in speaking of the defective state of certain privies, says,—

"These places ought to be removed immediately: they are too near the house; in summer time the stench arising from them is intolerable."

The Act already quoted gives the Board of Guardians power to remove such places, but none to rebuild them on a better plan, so that no good whatever can be done by the

simple removal of such a nuisance; if any benefit at all is to be the result, other and improved necessaries must be erected in their stead.

THE REMOVAL OF SOLID REFUSE.—I have already alluded to the generally existing deficiency of proper privy accommodation, and of the frequently bad state of the few necessaries I met with.

The absence of such places adds largely to the accumulations of refuse matter in the streets, which are frequently, as I shall hereafter have occasion to point out, in a bad state, their surface being uneven and broken up into hollows, where the liquid refuse accumulates.

This in itself adds considerably to the labour of the scavenger, and renders any thing like regular or efficient street cleansing a matter of some difficulty, even in those places where the scavenging is performed with greater frequency than was the case at the time of the inquiry.

From the evidence on this subject I may quote that of the Rev. *D. Meredith*, who said,—

"A more efficient system of cleansing is highly necessary. In many of the streets the pavement is very uneven, and the surface so much out of order that water collects in the hollows of it."

Mr. *G. B. Baker* also, speaking of the condition of Southgate, stated,—

"Southgate, one of the principal streets in Elland, having a dense population in the courts and alleys leading out of it, has for the last seven years received little attention from the surveyors of the highways, either as to its pavements or its causeways, although the highway rate is at present 1*s.* 3*d.* in the pound annually. In winter and during wet weather the uneven surface of the street appears like a pool of water. The accumulation of mud and filth is never taken away by a scavenger, but is, as I have frequently seen it, swept down the drains in large quantities on each side of the street, thereby tending to lessen their efficiency.

"Leading from Southgate on an incline, is Kiln-end-lane (a private road), into which large heaps of rubbish from excavations are occasionally led. During heavy rains a portion of this is brought down into the public street, causing expense to the town by the surveyors having to hire horses and carts for its removal.

"This nuisance has been at various times a source of contention betwixt the surveyors and the then owner of property into whose reservoir the sand and débris from this lane lodged, and who received from them in consequence, about four years ago, a sum of 10*l.* as damages. In order to prevent a recurrence of this in future, it appears the said 'wreck' is now diverted into the main sewer in Southgate, and judging from the discussions which have taken place on this subject at the vestry meetings it appears to me that

there is no remedy provided by the existing law to compel the owner of this private road to alter and amend the same."

I have made this lengthened extract from Mr. *Baker's* Report, not with a view to cast odium on the highway board or to lead any one to suppose that they have neglected the proper discharge of their duties, but simply to show that the law which they are appointed to administer really contains no provisions to remedy the evils of neglected scavenging; but even this ineffective and practically inoperative law is the only one in existence within the township which in any way meets the evil, and it therefore becomes of the more importance that additional powers should be conferred on the district for the benefit of its inhabitants.

THE WATER SUPPLY.—A large body of evidence will be found in the Appendix on the state of the existing water supply, the majority of the witnesses considering it insufficient in quantity, and, to some extent at least, in quality also.

It is stated in the evidence in the Appendix that Elland at present does not possess any water works or other means for the systematic supply of the inhabitants, who are therefore dependent upon what they can procure from wells on their own premises or in their vicinity. It is however but right to state that, compared with many other places which I have visited, the condition of Elland with respect to the water supply is comparatively good, though the evidence proves that it is easily capable of improvement. Considerable difference prevails in the statements of the inhabitants, some bearing testimony to the abundance of the supply, others speaking as strongly of its scarcity. This apparent inconsistency may be thus explained: the supply varies according to the locality, as must always be the case where persons are dependent upon pumps and wells for the water they require. In some parts of the town where good wells are to be found, the people are well supplied, in others where there are none, or where those that exist are polluted by the percolation of the sewage, there is great scarcity.

In support of the latter assertion, I may quote the evidence of Mr. Slater and of Mr. Hiley, both medical men, the latter of whom concurred in the statement of Mr. Slater,—

"That the poorer classes, particularly those residing in the south and east of the town, were most inadequately supplied with water, which was deficient both in quantity and quality. The supply for Southgate was so bad that the people were obliged to go as early as three o'clock in the morning to ensure their obtaining any.

"The best spring in the town, the Bridge-end well, was used by a great number of persons, particularly in summer, and by cattle also, but the water had been rendered unfit for use on account of some of the sewage of the town and the waste water of a malting having been discharged into it. The pollution of the water from these causes was sometimes so great that the cattle refused to touch it."

Mr. *W. Smith,* who has directed his attention to the chemical qualities of water, and to whom I am indebted for much valuable information on this and other matters connected with the inquiry, stated,—

"That the water of his own well was so bad that sometimes for weeks together he could use it for nothing but scouring the floors of his house, and it was of so hard a nature that it could not be used for washing purposes. The more fully he had investigated the question the more he was convinced that the inhabitants generally would concur with him on the great advantages of a better supply; he would further state, as his own individual impression, that all other sanitary improvements would prove of little or no benefit to the community, if a good and constant water supply were not introduced at the same time."

Mr. *Broadbent,* who has been a resident ratepayer in Elland for the last two years, said,—

"That he was very badly off for water; he had to fetch what he required for drinking and cooking purposes a distance of 50 yards. For washing and other domestic purposes he used rain water collected from the roof of his house. He considered it a great inconvenience and a source of considerable expense to have to send such a distance to the well he had spoken of, and he believed that a constant water supply would be a great boon to the town generally."

Having given some of the statements on the deficiency in the existing supply, I should be failing in my duty of drawing up my Report in a thoroughly impartial and dispassionate manner were I to omit to give some of the evidence, at least, which I received with respect to its abundance and excellence.

Mr. *James W. Baker* said,—

"He did not profess to understand thoroughly the merits of a good supply, but he could declare as a water drinker that the Southgate water was as good as any he ever drank in his life. It could scarcely be said that the supply was abundant, but it could still less be termed deficient. Many people had water on their own premises, those who had not could get it by going a little distance for it. As an advocate of sanitary improvements, however, he should be glad to see the supply increased, if it could

be done for a reasonable sum, particularly as within the last two years a well had been diverted which formerly yielded a considerable supply.

"In the house in which he resided an abundant supply of water, of which no complaint could be made, was pumped from a depth of about six yards, and that too in Southgate, a street which is exceedingly deficient in a good supply of water, but where any quantity might be got by sinking for it."

Mr. *J. Dodgson*, dyer, said,—

"That he considered it would be a hardship to compel him to pay for bringing a fresh supply of water into the town, when there was a superabundance of it already, at least in the quarter where he resided. He was the owner of property consisting of his own dwelling, a public-house, and two cottages. Of these his own premises, the public-house, and one of the cottages were each provided with a pump. The occupants of the other cottage obtain their supply from his dye works, and have to carry the water a distance of 80 or 90 yards. He did not give his evidence in favour of the existing system from any feeling of indifference for or neglect of the comforts of those about him, for he believed he was anxious to promote every object likely to increase the well-being of his fellow townsmen. With respect to the well mentioned by Mr. Baker, it was perfectly true that it used to yield a large quantity of water, as about 60 tenements were formerly supplied from it, but since the well had been diverted the people had been able to get what water they wanted from other places."

With respect to the evidence of Mr. J. Dodgson I would only observe that the fact of his particular premises being well supplied with water is no proof of its general abundance, and I cannot for one moment suppose that he meant seriously to make use of the argument that it was a hardship to contribute to the cost of a general water supply, because he had enough for his own individual requirements.

P. Hillam said,—

"That he had been in the habit of getting his daily supply from the well in Southgate during the last ten years. The water is muddy in summer, but it becomes clean after standing for a short time. He carries home about 3½ gallons every day, and this he uses for cooking and drinking; for other household purposes he takes the condensing water from a neighbouring steam engine. He would rather not see any waterworks established; for though his house is 300 yards from the well, he is not too idle to fetch from thence as much water as he requires for his family, which consists of his wife and two children."

The last witness may not consider it any hardship nor any serious tax on his time and labour to have to carry his supply from a well 300 yards from his house, but I fear in the great

majority of instances the distance to be travelled would and does act as a direct premium for the encouragement of dirty habits and the sparing use of soap and water.

The analysis of two samples of the best water from Elland and one from Norland Moor, a district in the immediate vicinity of the town, given in the Appendix (page 48,) will show the great superiority of the latter over the former sources. I reserve the consideration of the future water supply, and the best means of procuring a more abundant quantity, for that part of the Report which treats of remedial measures.

SEWERAGE AND DRAINAGE.—It may be inferred from the remarks I have already made, and those portions of evidence to which I have alluded, that Elland is virtually unsewered and undrained. As I have previously remarked, I found many things in the course of my inspection the effects of which were likely to be productive of sickness and premature mortality; but I encountered no evil so worthy of reprobation as the state of the sewers and drains at the time of my inquiry.

In even the best portions of the town the sewers are seldom more than three or four feet below the surface, and generally constructed on the most faulty and imperfect principles. With the best of the sewerage in this condition it follows as a matter of course that the house drainage is of the most imperfect and partial kind. As the sewers are at so small a depth below the surface of the street, it is a matter of impossibility to drain the lower floors of the houses, even where there are branch drains communicating with the main sewers; in numerous instances the liquid and solid refuse from the dwelling houses is carried out and deposited on the nearest gully-hole to find its way into and down the sewer by the mere force of its own gravitation. It must be remembered that the above is a description of the general practice in the more respectable portions of the town, and it is therefore almost superfluous to mention the state of things in the overcrowded and confined quarters tenanted by the poor and the working people. In these there are no drains of any kind, or, at the best, mere surfaced paved channels, where the liquid and solid refuse collects in an almost stagnant condition and poisons the surrounding atmosphere with its decomposing elements, or overflows the channels and saturates the unpaved ground around. In the former case the air becomes vitiated and unfit, or at least impaired, for the purposes of respiration; in the latter the ground becomes filled with matter from which the most deleterious gases are

generated, and, more than this, the nearest wells are in many instances poisoned by the percolation of the sewage water or other equally offensive matter through the permeable strata.

The evidence I shall now cite on the subject of the drains will bear out, I think, the literal truth of the above remarks.

Mr. *G. B. Baker* observed,—

"As to drainage I am of opinion we are sadly deficient, though few towns present such a fall for the purpose. The average depth of the sewers in the main streets is not more than three or four feet below the surface, their dimensions being about 1 ft. 6 in. by 1 ft. 3 in. In four of the principal streets, measuring in the aggregate a distance of 1,600 yards, there are not more than 100 grates fixed, and into them the sink and slop water of nearly every house facing the street is poured.

"In a private street towards the top of Elland, called New-street, there are two continuous rows of cottages running on for a distance of about 200 yards: of these one range is double and one single.

"To the back of this double row and extending about half-way down is a drain rendered quite useless by being nearly choked up for want of proper fall or outlet; the other half is still more so, the sink water and other refuse being thrown opposite the doors of the cottages, where part goes into a drain without an outlet, part is suffered to exhale and stagnate, and the overplus forces its way through the seams of a stone wall into an adjoining field, but which the occupier prevents, as far as he is able, by puddling up the back thereof with clay.

"The effluvium occasioned by this is extremely nauseous, and was complained of to me by several of the cottagers in the course of a personal inspection which I made of this locality.

"On proceeding down the front side of this double row I found no under-drain existing; the slop water and other vegetable matter was poured into the channel of the street, within about 2 ft. 6 in. of each cottage door, presenting an open surface ditch nearly the entire length of the street, and causing thereby a most offensive smell.

"The single range of cottages has a shallow drain about two feet below the surface channel in the street, which seems, from its general appearance, to have been badly constructed. The water for these dwellings is obtained from two wells in the street affording a never-failing supply, and for which a charge of about 1*s.* 6*d.* each cottage is made annually.

"If the owners of these cottages would sink two or three additional wells, build up better privy accommodation, and drain the streets, it could not fail to advance the value of their property and confer a great boon on the occupants."

I may refer to the evidence of Messrs. Hamerton, Slater, Hiley, and Maude, the medical men, for their unanimous opinion on the bad condition of the sewerage and drainage; Mr. Pitchforth, also, in expressing his opinion and defending

the generally good condition of the place, remarked, "The sewerage could not be said to be of the very best description."

Mr. J. Baker pointed out how beneficial the application of the Public Health Act would be to Elland, where the sewers were in the most defective state and the drains filled with stagnant refuse.

I had more than one instance given me of the overflow from the sewers; for instance, Mr. Smith, the registrar of births and deaths, said it had been no unusual thing to have his cellars filled with sewage water to a depth of three or four feet; the only way for its escape being by percolation through the walls. This overflow from the sewers found its way into his well, the water of which was often so discoloured by it for weeks together as to be unfit for drinking purposes, or indeed for any except that of washing the floors.

With regard to this pollution of the wells by the liquid contents of the sewers, I may also cite the evidence of Mr. *Waddington*, who said,—

"That if the well alluded to by Mr. Baker (Appendix, p. 42.) had been still in existence, it would not have been fit to use, as the sewage which was discharged into it had completely polluted the water."

Mr. Slater, in speaking of the unhealthiness of Gog-hill and New-street, pointed out the connexion between their bad sanitary condition and the drainage from the upper part of the town, "which fell over the surface of the rock where these places are built, and polluted one of the principal springs in that quarter."

I think it needless to multiply instances of a generally prevailing evil, which has been admitted by every witness who referred to either the sewerage or drainage.

LIGHTING.—In that part of the evidence bearing on the general condition of the town, it will be observed that almost every witness alludes to the necessity for public street lights. Elland already possesses gas-works, which are sub-let to a private firm, but there are no public authorities to make provision for gas-lamps in the public streets. It is unnecessary for me to remark on the great discomfort that must be suffered during a large portion of the year from this want. Many of the streets in the town are narrow and ill-paved, as I have already mentioned, and collections of refuse abound; all of which aggravate the annoyance caused by the absence of public lights.

The want of them is also a source of serious discomfort to the large numbers of the population employed in the mills, who throughout a considerable portion of the year are compelled to go to their work before day-break and leave it after night-fall.

The inhabitants of Elland have, as Mr. G. B. Baker has stated, on two several occasions endeavoured to remedy the evil, but both times without success, in consequence of a want of agreement as to the extent of the district to be lighted. It has been calculated by Mr. Baker that the cost of public lighting, together with that of cleansing and extinguishing the lamps, might be defrayed by a rate of 5*d.* in the pound on such property as that to which the benefit was applied.

The last Report of the Elland-cum-Greetland Gas Company will be found at length in the Appendix (p. 48).

Burial Grounds.—A detailed account of the number of interments that have taken place in the burial ground of the parish church, together with the nature of the soil and other particulars, was furnished to me by the Rev. David Meredith. I am indebted to Mr. James Baker for similar but less minute information on the burial grounds in connexion with the different dissenting chapels.

The first-mentioned statement proves that the parish church burial ground is greatly overcrowded, nor are those attached to the chapels in a much more wholesome condition. I shall treat the subject of intramural interments at greater length under the head of Remedial Measures. At present I shall only state that it is necessarily most prejudicial to the health of the town to have a churchyard densely crowded, and the surface of the ground so much raised above the level of the surrounding street, by decomposing human remains, that the bottom of each grave is positively higher than the lower floors of the houses. It is also most repulsive to our better feelings, and destructive of the reverential respect with which human dust should be regarded, that in every new grave opened the bones of former tenants of the ground should be rudely disturbed. The general practice of burying at so slight a depth as four feet from the surface is also one much to be reprehended, as the escape of the deleterious gases from the decomposing body is rendered much more easy and direct than if they were diminished in force and intensity by their passage through a greater extent of soil and vegetable matter.

The above remarks equally apply to the burial grounds of the dissenting chapels, in which, owing to their more

recent formation, the ground may not be so densely overcrowded, though it is far too limited in space for the number of bodies that have been interred in it. These places are also open to great objections on account of their very small extent, and the number of dwellings by which, in general, they are surrounded on nearly every side.

REMEDIAL MEASURES.

THE EFFECT OF SANITARY REGULATIONS.—In two recently published Reports on districts in the immediate vicinity of Elland, (into the sanitary condition of which inquiries have been made under the provisions of the Public Health Act,) I have at some length detailed the more specific causes and effects resulting from the evils of overcrowding, neglected ventilation, and the decomposition of town refuse.

On the present occasion I shall refrain from repeating this information, because it is probable that it has been already perused by some at least of those into whose hands the present Report may fall. I must not, however, omit to repeat what I have already stated, that the proper light in which to view all sanitary legislation and sanitary improvement is to regard the existing evils as of a general nature, the cure of which can only be effected by the application of comprehensive and efficient remedies, proportioned to the means possessed by the inhabitants to provide them.

To make a drain here, and fill up a cesspool there, may perhaps benefit some particular locality, but it will effect no improvement in the general health or comfort of the inhabitants; more than this, it may easily happen that the very quarter where the improvement is made may suffer from the poisonous effluvium of some neglected drain or cesspool, in a street where no sanitary reforms are in progress. No doubt the destructive agents, produced by stagnant dungheaps and untrapped gully-holes, are encountered in their greatest intensity in the immediate vicinity of such places, but their fatal results are by no means confined to these narrow limits; it is quite possible that the inhabitants of the best parts of a town may be struck down by pestilence engendered in some ill-ventilated court or overcrowded alley, tenanted by the very poorest of the community.

It is for these reasons that I would urge on the ratepayers of Elland the necessity of considering the improvement of their town in a far more comprehensive light than many of them as yet appear to do. If its condition is to be

ameliorated and its standard of health elevated, not only must its sewerage and drainage be amended and its water supply rendered more abundant, but greater regard must also be paid to the construction of the poorer class of dwelling houses, so as to avoid the bad effects of overcrowding and lack of ventilation.

If works are done piecemeal, and not on any regular system, Elland will have as little right to be considered in a really good sanitary condition, as its water supply can now be properly termed abundant, because there are plenty of wells and pumps in certain streets and attached to particular properties.

Nor are the advantages of a combined system of public and private works confined to the improvement of public health only, they extend also to the indispensable one of economy. It is plain that a saving must result to the ratepayers of a district if the whole of the works are carried out under the superintendence of one body, at the same time, and on a regularly devised plan. Until recently, it is true, these advantages, however self-evident, were unattainable, but they are now, by the operation of the Public Health Act, placed within the reach of the ratepayers of this or any other district.

Some of the most self-evident benefits conferred by this measure have been thus pointed out by the Registrar-General :—

"Without going into particulars, contending that the details admit of no improvement, or being sanguine enough to imagine that the municipal authorities will carry out as rapidly as could be desired the plans for the improvement of the health of the town population, it must be admitted that, on the whole, the Public Health Act is an excellent measure, and well calculated to diminish the evils which have been discovered, and of which the effects have been recorded in the periodical returns. It is no innovation on the institutions of the country, and rests on no new-fangled doctrines. It extends the rule of a cabinet minister from 'possessions' which Mr. Burke declared 'fitter for the care of a frugal land steward than of an office in the state,' to the domain of national health, which has always held the first place in the meditations of legislators ; it concentrates offices, that ought not to be separated, in the hands of the municipal authorities, still maintained in close connexion (as they always have been) with the Crown ; it seeks to secure water, pure air, and a little sunshine, for the inhabitants of cities now so large, active, and important a part of the population, and to extend to the house and street of the tradesman, artizan, and labourer, a share of the advantages which elsewhere are the boon of nature, by the use of means which have been suggested by science, and sanctioned by long experience."

The constitution of the Local Board being of an essentially popular nature, gives the ratepayers the best possible control over their acts, and the annual infusion of new members into the Board affords them a tolerably strong check against any wasteful or reckless expenditure of the rates which, as a Board, they have the power of levying.

MORTALITY.—I was not furnished with evidence to enable me, in the previous part of my Report, to devote any space to a consideration of the present rate or amount of mortality.

The testimony, however, of the medical men proves that a considerable portion of the diseases prevalent in the poorer portions of the town are due to diseases of a preventible nature.

On referring to the evidence of Mr. Hamerton, it will be found that he alluded to Mr. Smith's Report to the Registrar-General for the year 1847, and that he considered the causes which it was stated then affected the health of the community were in equal activity at the time of the inquiry.

Mr. Smith's Report has been so long published that I am unable to insert it as a proof of the existing mortality, but I may be permitted to refer to it in discussing the general question of mortality and its connexion with a neglect of sanitary precautions.

The Report, which is for the quarter ending March 1847, says :—

"The deaths are 115, or considerably above double the average of deaths. The greatest fatality has been with children under two years. Scarlatina caused 14 deaths, and typhus three ; which diseases have an entirely endemic character, and been confined to the *highest parts* of the district. It is worthy of observation that whilst the number of deaths increased considerably towards the close of last autumn, these were found to occur chiefly in the lower part of the district, which has only the natural drainage which the open nature of the soil situated on the first series of the 'millstone grit' affords, but which is, at the same time, lamentably deficient in a *due supply of water* to carry off the refuse from the buildings, as the only resource for this purpose is rain water. Owing to the protracted drought and excessive heat of last summer, these evils were greatly aggravated ; and, in consequence, large accumulations of animal and vegetable matter were lodged in the soil, in the immediate neighbourhood of a large population, who were the first to suffer from the volatile poison thereby eliminated. The evil, however, does not seem to stop here. Though this part of the district has had for two months an average healthiness, the higher and more remote parts have suffered severely from the epidemics before alluded to."

There is no part of the above Report more worthy of note than that which refers to the excessive mortality amongst children under two years of age, because it is upon the tender constitution of the young that all causes prejudicially affecting health naturally act with the most fatal results.

It is by the large proportion of deaths amongst young children that some of the strongest proofs of the effect of bad air upon the human frame can be most strongly substantiated. It is a common thing for persons, who are loath to admit the full extent of the harm produced by the neglect of sanitary regulations, to point out some few cases of persons who have attained old age in the enjoyment of good health, in spite of the dirt and discomfort by which they have all their lives been surrounded. It must not be forgotten, however, that these are exceptions, and rare ones also, of persons originally of the strongest constitution, who have as they grew up been gradually seasoned to and hardened against the bad effects of the noxious agents which have destroyed hundreds of the weakly and ill-conditioned.

I think it highly important, therefore, to draw attention to the high rate of infantile mortality at Elland, as a proof that neglected drainage and foul exhalations produce the same results there as elsewhere, with less virulence perhaps, selecting their victims from the young and weak rather than the vigorous and middle aged, but still with a certain amount of destructiveness not the less formidable because the sufferers are those of the rising generation.

The unhealthiness of towns and the causes of it have attracted more attention of late years than they did formerly, but to prove that the advocates of sanitary measures are advocating no new opinion, but are now only repeating the arguments urged by scientific men sixty years ago, I may use the following remarks of Dr. Price, who, in pointing out the appalling fact that the average duration of life in towns was only half that of the country, remarks :—

"From this comparison it appears with how much truth great cities have been called the graves of mankind. It must also convince all who consider it, that it is *by no means strictly proper to consider our diseases as the original intention of nature. They are without doubt, in general, our own creation.* Were there a country where the inhabitants led lives entirely *natural and virtuous, few of them would die without measuring out the whole period of the present existence allotted them;* and death would come upon them like a sleep, in consequence of no other cause than gradual and unavoidable decay. Let us, then, instead of charging our Maker with our miseries, learn more to accuse and reproach ourselves.

"The reasons of the baneful influence of great towns, as it has been now exhibited, are plainly, first, the irregular modes of life, the luxuries, debaucheries, and pernicious customs, which prevail more in towns than in the country; secondly, *the foulness of the air in towns, occasioned by uncleanliness, smoke, the perspiration and breath of the inhabitants, and putrid streams from drains, churchyards, kennels, and common sewers.*"

I need only refer to the evidence contained in the present Report to prove that if such nuisances, as those enumerated in the above extract, *do* breed pestilence and disease, (as is most certainly the case,) there are then many destructive agencies at work in Elland, the effects of which must be prejudicial to the health of its inhabitants, whose bounden duty it therefore is to see that such are entirely removed, or rendered as little hurtful as possible.

THE REMOVAL OF SOLID REFUSE.—In my remarks upon the sewerage and drainage, I have alluded to some of the most palpable evils produced by permitting solid refuse to collect and become decomposed. Even under the best and most general plan of drainage, much solid refuse must necessarily collect in and around every dwelling, and, if not removed in time, become prejudicial to health. The evil, however, is greatly magnified in a town like Elland, which is badly and partially drained, and where much that ought to go down the sewers remains upon the surface of the streets.

I have already remarked that there can be no executive body to undertake an efficient system of scavenging until a Local Board is appointed under the Public Health Act; the following is a brief summary of the powers conferred upon the Local Board for removing refuse matter and providing public necessaries.

The 55th section empowers the Local Board to have all the streets properly cleansed and watered, and all dung, rubbish, soil, filth, &c., thereon collected and removed. They are also authorized to make byelaws with respect to the removal of dust, ashes, &c., in any house, street, or place whatever, or to prevent any deposits thereof so as to be a nuisance to any person, and also to make regulations with respect to the times and manner of emptying and cleansing water-closets, privies, and cesspools.

Section 56 enables the Local Board to provide boxes and other conveniences for the collection of dust, rubbish, &c., and also fit places for the deposit of sewage, filth, soil, rubbish, &c., the collection of which is to be vested in them, and sold by them, the proceeds of the same being carried to the district fund account.

The 57th section enables the Local Board to provide and maintain in proper situations water-closets and other similar conveniences for public accommodation, and to defray the expense out of the district rates.

THE IMPROVEMENT OF THE STREETS.—I have alluded in the earlier portion of this Report to the generally bad state of the street pavement; and it will be found, on referring to the Appendix, that there is great room for improvement in even the best quarters of the town. Owing to the absence of any Local Act the management of the streets is vested in the highway surveyors, but as this body, by the terms of their Act, have only power over streets which have been pronounced to be highways, it necessarily follows that a large proportion of the poorer thoroughfares of the town, as well as the whole of the courts and yards, are not in the least degree under the control of the local authorities.

The discomforts occasioned by bad pavement are so perfectly self-evident that I shall not dwell upon them at any length. It will be sufficient to remark that it is indispensable that the surface of all the streets should be put in good condition before the labour of the scavenger can be attended with much benefit; and that good pavement is the first requisite for removing that fertile source of disease, damp, from the dwellings of the poor especially, who are at present, owing to the reasons I have already given, more exposed to its bad effects than the other classes of the community.

When the pavement is in good condition not only are the labours of the scavenger facilitated, but the cleansing of the streets by copious applications of water becomes an easy task. In the same way also the dirt and discomfort which now attend a heavy shower will be entirely obviated, for the rain will then run quickly off the surface instead of collecting, as it now does, in the hollow places of the uneven pavement.

In addition to the surface the Public Health Act gives ample power for improving the line of the streets by adding to their width, and ensuring uniformity in the width and level of those newly laid out. The following is a brief enumeration of the powers intrusted to the Local Board in this respect.

By section 68 it is provided that all present and future highways are to be placed under the management of the Local Board, who are also empowered to take such steps as they think requisite for putting them in good order.

By section 69 the Local Board have the power of ordering private or undedicated streets to be paved, sewered, &c.,

by the respective owners of property, in proportion to the amount of frontage possessed by each landlord, and in case of his refusal they have the power of making the improvements at their own cost, and recovering the amount of the same from the owner, or else declaring the same to be due from him in the shape of a private improvement rate, in the same way as is provided for in the case of house drainage.

By section 70 however, the Local Board have the power, if they think fit, to declare any private street to be a highway, and it is then to be repaired by them out of the rate, unless the owners of property object to their doing so.

Section 72 gives the Local Board the right to compel any persons intending to lay out a new street to give written notice of the same a month before doing so, and furnish them at the same time with full particulars as to the length, width, &c. of the street, the Local Board having the power of approving of or rejecting the same, as they may think fit.

Section 73 enables the Local Board to purchase premises for the improvement of any street which may require widening, opening, enlarging, &c.

I ought to state, moreover, that the word "street" has, in the Public Health Act, a most extensive application, and includes every portion of a town where there are habitations, whether the same is a thoroughfare or not.

SEWERAGE AND DRAINAGE.—I have already stated the effects produced by want of sewerage and drainage, or by laying them down on a faulty or piecemeal system. Evidence has been given showing that many, if not all, of the sewers are incapable of fulfilling the great requisite of a speedy discharge of their contents, without leaving any deposit behind.

The fact is, that by the present system, the sewers are expected to perform certain acts which they are positively unable to accomplish.

The few sewers that do exist in Elland are made upon the old-fashioned plan; viz., large and square-shaped, so that, except after heavy rain, the flow of liquid through them occupies but a very small portion of each sewer. The inevitable consequence is, that by far the larger portion of the solid matter held in solution is deposited at the bottom of the sewer, and separated from the liquid stream in the course of its sluggish descent to its final point of outfall. The deposit of solid refuse is further increased by the inequalities which the sides and bottoms of such sewers necessarily present to the current of liquid passing through them. Nor must it be forgotten, that this solid matter,

when deposited, is precisely in that condition when it assumes its most dangerous stage, that of decomposition. The same remarks apply to the house drains communicating with the sewers; for the former are constructed on the same principles as the latter, and are, therefore, productive of precisely the same effects. I shall now briefly describe in what these consist.

Every one is aware of the foul smell which rises from the open grate of an untrapped gulley-hole, but, perhaps, there are many who have never considered what this stench really is: it is caused by the decomposition of the refuse in the sewer, which, by its passage into that stage, has become poisonous, and engendered various noxious gases, amongst the most fatal of which is sulphuretted hydrogen, which, in condensed form, is a deadly poison to all animal life; so fatal indeed, that, as Mr. *Grainger* has remarked,—

"Human beings have occasionally perished on the instant from accidentally inhaling this gas in a concentrated form; and other persons, from breathing these emanations, when more diluted, have become faint, delirious, and insensible; so there can be no reasonable ground to doubt that the inhabitants of courts and alleys, and back streets, who, when at home, breathe an atmosphere impregnated with this pernicious gas, although of course greatly diluted, do thereby receive into the system, through the ever acting respiratory organs, a remote cause of disease."

The evidence on the present sewerage shows most plainly that these poisonous gases are breathed by the inhabitants, because it is there stated that the sewer gratings are open, and admit of a free escape of the foul exhalations from the stagnant refuse in the drain. If even the gratings were trapped or provided with valves to prevent the escape of these poisonous gases, the evil would be only mitigated, not prevented, because it is certain to be met with in all sewers constructed on the present system.

The author last quoted, whilst speaking on the subject of the unhealthiness of towns, and the effect of bad sewerage and drainage, observes:—

"Let us consider the effects of the noxious condition I have just described. The whole area of a town, contaminated by all the noxious matters mentioned, is continually pouring into the air exhalations which to breathe in any concentrated form is disease and death. This malaria is not confined to the foci where it is mainly generated, but is carried by the wind to all places and districts; into shops—into the drawing-rooms of the merchant and man of fortune—into sleeping apartments—into kitchens, where food is being prepared—into the poor man's only room, where, amongst other evils, the water used by the family imbibes the

poisonous exhalation ; in fact, no place is free from this penetrating and subtle agent."

By the use of impermeable tubular stoneware pipes, the evils inseparable from the usual system of drainage are altogether avoided. In the first instance their cylindrical shape entirely obviates the defect of the old square sewer, (in which the force of the water was weakest at the point where it ought to be strongest, the bottom,) and enables the whole of their contents to be carried down without deposit to their point of outfall. The smoothness of their inner surface prevents any solid matter from adhering to the sides of the pipes, so that there is no danger of their becoming choked up. Lastly, the much greater ease with which small pipes can be laid, affords advantages, in every case, for securing a better and more uniform descent than by the present method,—a matter of great importance, when it is considered how essential it is that the sewers should be emptied before their contents have become decomposed.

These stoneware pipes are as applicable to house drains as to main sewers, and in both cases present equal advantages over those constructed on the old plan.

The cheapness of these pipes, compared with the old-fashioned sewers, is also a most important consideration. A sewer or house drain made of stone or bricks and mortar is necessarily a very costly work, so much so indeed as to render any general application of them to a town all but impracticable on the score of outlay alone.

Under the old sytem it was not to be expected that owners of property, particularly of small tenements, would incur any heavy additional expense for mere sanitary works, because their cost was certain to far exceed any return they were likely to get in the shape of increased rents. The Public Health Act, however, has introduced a great change for the better in this respect ; for by its provisions the Local Board are empowered not only to construct the main sewers but to undertake the formation of branch and house drains for private individuals, if there is any difficulty in getting the owners of the property to execute the work. In such cases, the cost of the work will be distributed over a long period of years, and the amount of each annual instalment collected in the shape of an improvement rate.

The advantages of such an arrangement to a landlord are obvious. The simultaneous laying out of a large extent of drainage will not only enable the Board to execute each individual portion at much less cost than if it had been done

by the persons to whom the property belongs, but the adoption of a general system will also ensure efficient house drainage to each owner of property, and save him from the risk he now runs of having his next-door neighbour laying out his drains on a different plan and perhaps a higher level than his own.

Without the aid of a minute survey and accurate plan of the district, I do not consider myself justified in giving any estimate of the cost of completing the sewerage and drainage of the town, and still less of offering any detailed and exact account of the precise size and quantity of pipes required for the purpose. It will be sufficient, however, for me to state, that from what I saw of the town in the course of my inquiry, and speaking from the experience I have had in similar places in my office of Superintending Inspector, I do not imagine that any main sewer pipes will be required of larger dimensions than nine inches, the majority of them being, of course, under that size. The pipes for the house drains need not, in general, exceed four inches in diameter.

Before concluding my remarks on this subject, I shall briefly mention those sections in the Public Health Act by which the Local Board are empowered to take steps for the formation of new sewers and the improvement of such as were in existence previous to their appointment.

By section 43 all public sewers within the district existing at the time of the application of the Act, or to be afterwards made, are to be vested in and placed under the control of the Local Board of Health, who have (by section 44) also the power of purchasing the rights which may be vested in any person for their construction.

By section 45 they have the power to repair, or, if they think fit, close and destroy, the existing sewers, and cause such others to be made as may be required for effectually draining the district; ample powers being given them by the same section to break up public streets and enter on private premises for the purpose of doing so.

By section 46 the Local Board are to cause the sewers under their charge to be so kept as not to be a nuisance or injurious to health, and they are at the same time empowered to collect the sewage and sell it, taking care, however, not to create a nuisance thereby.

By section 47 any one is forbidden to make a sewer or drain communicating with any belonging to the Local Board, without their consent being first had and obtained, under a penalty of five pounds.

By section 48 any person residing beyond the district is allowed to make a drain or sewer communicating with those

of the Local Board upon certain conditions to be agreed upon.

Sections 90 and 91 provide for the terms upon which arrangements must be made between owners of property and the Local Board for defraying the cost of certain works out of the "Private Improvement Rates," and distributing the repayment of the same over a term of years.

THE APPLICATION OF THE REFUSE.—In considering the best means of remedying the condition of the existing sewerage and drainage, I must not omit to state in what way the contents of the sewers may, in my opinion, be made beneficial to the district.

I have not, in my remarks on the sewerage and drainage, stated which I considered the best point of outfall; indeed, I am withheld from doing so by the same causes as those which prevent me from stating the cost of the works or the exact size of the stoneware pipes I have recommended.

In deciding on the point for the outfall of the sewage, it is essential that it be placed at such a distance from any crowded locality as to obviate the risk of its occasioning sickness or annoyance to the persons resident in the vicinity. It is highly important, also, that some point should be chosen where the sewage may be applied to the farm or arable lands in the neighbourhood with facility and economy.

I shall not go into detail on the subject of liquid sewage manure, its advantages, or the best means of applying it, but this much I can state with certainty, that all the best authorities, practically conversant with the subject, are agreed upon the much greater value possessed by manure in a liquid compared with that in a solid form, because the fertilizers in the former case at once become of use to the plant or the soil; whilst in the latter much of their value is lost by evaporation and the action of the atmosphere upon the manure before it is incorporated with the soil.

It is impossible to form any fair criterion of the real value of the sewage by comparing it with what is now received by the surveyors of the highways for a portion of the town refuse. There can be no doubt however that it is capable of being made a source of considerable income. If some are disposed to doubt this statement they must remember that under the most unfavourable circumstances the application of the sewage will convert a fruitful source of disease and discomfort (nearly the whole of which is now entirely lost and wasted) into a most important element of health and fertility, by largely adding to the productiveness of the land in the neighbourhood of the town.

In making the above remarks I am quite aware that the efficient carrying out of a system of sewage application will be attended with considerable difficulty. I allude to it, and recommend its use, however, on this as on other occasions, because I am convinced of its great importance and of the wonderful results that may be expected from its employment. These will, of course, be proportioned to the extent of the town to which the sewage is to be applied ; but as far as they go they will not on that account be the less striking.

As a proof that liquid sewage is found to answer on the even the smallest scale of application, I may state that some of the most satisfactory experiments have been tried upon small portions of ground with the refuse of a single house.

If, therefore, the wonderfully fertilizing powers of liquid sewage manure have been proved by a series of trials on a small scale, we have a full right to look for the same gratifying results when the refuse of an entire town is distributed, on some systematic plan, over the cultivated land of the surrounding neighbourhood.

THE WATER SUPPLY.—In recommending any improved scheme for the water supply of Elland, it must be remembered that that contemplated by the Public Health Act is of a far more abundant nature than the majority of persons understand by the terms "good, constant, and wholesome."

Under a system fulfilling the three above-mentioned conditions, perhaps the smallest quantity of water used is that taken for mere personal uses. It is however in this latter sense alone that the evidence on the present occasion is to be understood, when it describes the present supply at Elland as good and ample.

It is, of course, of the highest importance that every man should have good water to drink, and an abundance of it wherewith to cleanse his person and his habitation, but apart from these private uses there are public ones of hardly less importance.

I shall proceed to consider both of these, and, having first briefly examined whether either of them were attainable at the time of the inquiry, shall then state by what means the inhabitants can, in my opinion, best secure the inestimable advantages of a good supply of water.

First, then, to consider a good supply of water in its relation to domestic and personal uses alone. I shall not on the present occasion enter into any details to show the necessity, if the body is to be kept thoroughly healthy, of frequently removing, by plentiful ablution, the perspiration and the impurities brought to the surface of the body by the natural action of

the skin. I shall take it for granted that every one is ready to admit the advantages of personal cleanliness, and the desirableness of offering every encouragement for its promotion. There is however but little chance of success if persons are dependent on a supply of water brought from pumps and wells, at a distance from their houses.

Amongst the higher classes of this country personal cleanliness is the rule and not the exception ; and persons who have once acquired the habit will sacrifice both time and money before they will submit to be deprived of the means of frequent ablution. The consequence is, that in these cases there is not only the wish to be cleanly but the means also of providing a supply of water for the purpose.

With the poor, however, it is very different. In their case, they are considered well provided with water if there are one or two wells or pumps to supply a whole row of houses.

I am ready to admit that even this is a much more liberal allowance than is often met with ; and that Elland, as I have already remarked, may be almost said to be well supplied with water compared with such a district as the neighbouring one of Dewsbury. My present intention, however, is to prove that even this comparatively good supply is not sufficiently abundant to promote personal cleanliness.

If any one gives the subject the least consideration, he will at once perceive that the mere carrying of the water from the common well, or pump, however near it may be, entails a very serious amount of labour. A working man is at his regular employment during the whole of the day ; he goes to it early in the morning, he leaves it late at night ; so that he cannot be expected to fetch the water for the wants of his family : the duty, therefore, devolves upon his wife, who has in general quite enough to occupy her time without this additional employment. The natural consequence is, a strict economy, instead of a lavish profusion, in the use of water for all domestic purposes. However the practice may be regretted, it is one at which we cannot wonder : it is in vain to look for improvement in the personal cleanliness of the people, as long as it is made attainable only by serious labour and great outlay of time. Put a constant and cheap supply within the walls of a poor man's dwelling, and there is little doubt he will make use of it ; compel his wife or himself to resort to a pump or well, even though he pay little or nothing for the water, and carry every drop he requires, and we may feel certain he will make the trouble the excuse for remaining dirty.

In the above remarks I am presuming that the supply from the pumps or wells is of the best description; if, however, it be not so, but, on the contrary, intermittent, and the water bad when procured, the force of my previous argument is increased tenfold; for, in addition to the reluctance induced by the labour of bringing the water, there is that caused by an unwillingness to be exposed to the struggle and confusion at the well, the loss of time spent in waiting for "a turn," and a pailful of muddy water as the result of the operation; there is little doubt but that these combined obstacles will effectually prevent the growth of cleanly habits.

I do not mean to say that if habits of cleanliness have been once established, such obstacles as those I have mentioned will cause them to be abandoned, but I have little doubt of their being powerful enough to prevent their first formation.

I think precisely the same arguments may be used in the case of the water required for household purposes, and that the labour of procuring it is sufficient to prevent the poor from being as cleanly in their dwellings as they would be if they had the means of obtaining a plentiful supply without the labour of fetching it from a distance.

Having alluded to the advantages of a good supply of water for domestic purposes I shall now consider some of the many public uses to which it is applicable. One of the most important of these is the flushing and cleansing of the sewers and drains; an operation which will of course be rendered much more necessary hereafter, when the Public Health Act is applied to the town; because under the improved system, which will then be introduced, an increased quantity of the liquid and solid refuse, which is now deposited on the surface of the streets, will be discharged into the sewers and house drains. These being formed of tubular stoneware pipes, admit, as I have already observed, of being cleansed of all impurities, with a readiness unknown in the case of the old-fashioned sewers, the only requisite being a cheap and ample supply of water at such an elevation as will admit of the flushing of the sewers and house drains of the highest portion of the district. Again, the introduction of water-closets where there are no necessaries, and the general substitution of water-closets in the place of common privies, will entail a further necessity for a supply of water to every house. In addition to these demands must be added those for occasional supplies of water for the extinction of fires, and the cleansing of the streets. If the supply is con-

stant, there is a ready provision against fire by the insertion of fire plugs at frequent intervals, to which the ordinary hose can be fitted; and a plentiful stream of water obtained without the necessity for the apparatus of fire engines and their appurtenances, the effective maintenance of which is always a most expensive and troublesome task. These fire-plugs are of course equally available for all purposes of street cleansing and watering, and I may observe that recent experience has proved that if the streets are well paved, their surface is more cheaply and effectually cleansed by the plentiful application of water than by any of the ordinary methods of sweeping either by machines or manual labour.

I could easily have enlarged on any of the above named uses to which water may be put, but I trust I have said sufficient to indicate that no supply got by manual labour from separate wells and pumps can ever fulfil the conditions which the Public Health Act demands, even though the yield of water should be excellent in quality and abundant in quantity; and that therefore no effectual remedy can be applied in the case of Elland by adopting the recommendation of one of the witnesses, "that additional wells should be sunk in those quarters where the supply was the most scanty."

Having had so short an acquaintance with the district, and so limited an experience of its general features, it is impossible for me to assert in positive terms the precise source of the future supply of the town. It will, however, answer every purpose intended by a Report of a merely preliminary nature, if I state that I have reason to believe that in the immediate vicinity of the town there are ample facilities for procuring, at a cost within the means of the poorest inhabitants, a plentiful supply of water of excellent quality, without the aid of engine power for lifting the water; this is indicated in Mr. Smith's Report on Norland Moor (Appendix, page 47) and Norland Clough, and their capabilities for affording the means of supply. The water obtainable from the first of these two sources is of the first quality, as is shown by Dr. Playfair's analysis of three samples of water sent to him from Elland, from which it appears that two wells in the town gave respectively 9·17 and 16·16, whilst that from Norland Moor only gave 3·15 grains of inorganic matter in an imperial gallon.

Dr. Playfair's analysis also shows the relative proportions of the ingredients, which constitute "hardness" in water, to be as follows :—

No. 1.	Sample from	Norland Moor	2·03
„ 2.	„	„ South Wells	7·98
„ 3.	„	„ Appleyard's Well	13·67

The following is an enumeration of the principal powers conferred upon the Local Board for obtaining a supply of water.

Section 75 enables the Local Board to provide their district with such a supply of water as may be required for both the public and private purposes of the Act, and they may also keep in any water works provided by them a supply of pure and wholesome water, constantly laid on, at such pressure as to carry the same to the top story of any house in the district so supplied.

Section 76 empowers the Local Board, upon the Report of their surveyor, to provide any house without water with a supply, if the same can be furnished at a cost not exceeding twopence weekly, and to charge the cost of the work as private improvement expenses, and levy the rates upon the house in the same manner as if the owner had applied for a supply.

Section 77 empowers the Local Board to supply water to public baths and wash-houses, or for ordinary trading purposes, whilst

Section 78 gives them power to afford a gratuitous supply to the town by means of pumps, wells, &c., as well as to public baths and wash-houses, not established for private profit or supported out of the poor or borough rates.

Before concluding this Report, I must beg the indulgence of your Honourable Board, if on the present occasion I have gone over ground already repeatedly travelled, and dwelt upon a consideration of remedies, already frequently recommended. Knowing, however, that although the Report is made to you alone, the terms of the 9th section of the Public Health Act enjoin its circulation throughout the district on whose sanitary condition it is drawn up, I have thought it advisable to explain many points, and enter minutely into several particulars, which it would have been superfluous in me to have done had the Report been confined to the perusal of your Honourable Board alone.

In every district to which the application of the Public Health Act is recommended, it is highly important that the inhabitants who are to be brought under its operation should have laid before them the evils the act is intended to cure, the remedies it proposes for that desirable end, and the means by which they are to be applied, because

it may be taken as a general rule that in every town, whether large or small, there are a number of persons who, either from indifference or from habitual familiarity with the many evils around them destructive to health, have never seriously considered the bad effects they produce, and these persons are therefore necessarily in total ignorance of the most effectual means of remedying them.

CONCLUSIONS.

The general conclusions suggested by a consideration of the preceding Report are as follows.

1st. That the mortality of the town is, in some degree at least, owing to causes which are easily susceptible of removal; for though there is no evidence of the present number and proportion of deaths, there is that of several of the witnesses, who state that the general condition of the town is in no wise improved since 1847; and at this period the Registrar of the district clearly proves that the neglect of certain sanitary precautions had entailed a large amount of sickness and mortality, which might, humanly speaking, have been avoided by proper attention to the better drainage and more abundant water supply of the district.

2d. That the streets of Elland are in a most unsatisfactory state, and that there is little or no prospect of their improvement under the present system, because the powers of the highway surveyors (the only body possessing any jurisdiction in this respect) are of so limited a nature, as to prevent them, however anxious they may be to do their duty, from remedying the defective condition of the pavement, or organising any plan of scavenging for the undedicated portions of the town, in which, as in other places, the majority of the poor reside.

That the most effectual mode of carrying out these improvements is by means of the Public Health Act, by the provisions of which ample powers are given to remove the many collections of offensive refuse, and remedy the numerous defects on the surface of the streets, more efficiently and more economically than by any other Act in existence.

3d. That the internal condition of the houses is far from good; and although it is not practicable, nor indeed advisable, to interfere with the private arrangements entered into between landlord and tenant, even where these are of such a nature as to entail positive suffering upon the latter, yet that it is highly important that every facility should be given to both owners and occupants of property to put the same in a healthy state. The application of the Public

Health Act will naturally tend to this desirable end, as the Local Board of Health will have the control of the streets; so that all which may be laid out for the future will have sufficient width and space for ventilation, and be constructed with a regard to proper levels for the purposes of thorough drainage. Again, the provisions contained in the Act against the habitation of cellar dwellings, except under certain conditions, will go far to protect their occupants from some of the worst evils to which tenements of this class have hitherto been generally subject. Lastly, the powers conferred on the Local Board to make the cost of certain improvements payable from "private improvement rates," and to perform certain works for owners of property on the understanding that the outlay be repaid by yearly instalments for the gradual discharge of the total cost incurred, will be of great service to private individuals. These provisions, and many others which might be enumerated, create facilities, not previously existing, for owners of property to improve its sanitary condition on a general system, and on easy terms to themselves, in a pecuniary point of view.

4th. That both the sewerage and drainage are partial in extent, imperfect in operation, and in some cases positively prejudicial to health and productive of the very evils they were intended to remedy. That the Public Health Act holds out the only hope of an improvement in their condition, because, except under its provision, there is no authority to enforce the laying out of works of sewerage and drainage on some general plan and system. That until this is done, the sewerage and drainage must remain imperfect, because one portion of the town, if drained at all, will be so on one system, and another on another, and thus entail a heavy outlay on the owners of property for works which will after all be of an inefficient kind; *whilst by the adoption of a proper system, under the provisions of the Public Health Act, it may be made self-supporting, and the inhabitants relieved from any taxation for the construction of the works.*

5th. That the supply of water, though much better than that of some places in the immediate vicinity, is yet neither so good nor so abundant as the Public Health Act requires, but that the conformation of the district offers every ground for believing that a most ample and pure supply may be obtained from the immediate neighbourhood at a cost quite within the means of the district; *and in this case the water rate will not amount to* 2*d. per week for houses rated at* 10*l. per annum, and under.*

6th. That the want of public lighting is an evil much felt by all classes of the population, and that it is most desirable

that the defect should be supplied as quickly as possible. The Public Health Act does not make any provision for the Local Board to take the management of gas works, but when they are once elected, the duty of publicly lighting the town will devolve more properly on them than on any other body.

7th. That the burial grounds attached to the different places of worship are all of them more or less overcrowded, and their united extent much too limited for the rapidly increasing population of the town. That it is therefore much to be desired that a general cemetery should be established at a convenient distance from the town, far enough from it to avoid the numerous evils of which intramural sepulture have been productive, but sufficiently near to prevent inconvenience and excessive outlay in the removal of the dead to their last resting place. If a general cemetery is established, care must be taken to choose a suitable site, and a dry gravelly soil, as that best adapted for a speedy return of the body to its kindred elements. The daily recurring scenes of the rude disturbance of the dead in the present churchyard must be more instructive to the inhabitants than anything I can urge; I therefore consider it superfluous to dwell upon the necessity of devoting enough space to the new cemetery and taking such precautions in its formation that every coffin may remain undisturbed and unmolested after it is once placed in the ground.

In arriving at the above conclusions of the great importance of the Public Health Act, and the benefit the town of Elland may expect to derive from its application, I have not been unmindful of the smallness of the district, and the paucity of its resources compared with places of greater extent and importance. I feel confident however that if these were much smaller than they actually are, it would yet be to the advantage of the town to apply the Public Health Act and to lay out works and carry out improvements under its provisions. If this be done by the Local Board in a proper spirit, and with the strictest regard to economy in every department, I believe that the result will be a diminution instead of an increase in the local burdens.

On referring to the Appendix it will be found that although the petition or the inquiry emanated from the township of Elland-cum-Greetland, the whole of the evidence relates to the town of Elland only; Greetland is in fact an agricultural district, and therefore free from most of the evils attendant upon a dense town population.

RECOMMENDATIONS.

I therefore beg respectfully to recommend that the Public Health Act (1848), except section 50, be applied not to the township of Elland-cum-Greetland, but to that portion of it indicated upon the plan prefixed to the Report; as, however, this district is not co-extensive with that from which the petition for the inquiry emanated, and has not a known and defined boundary, it will be necessary to hold a second inquiry to determine the boundary of the district.

2d. That the Local Board of Health, to be elected under the 14th Section of the Act, consist of nine persons, and that the entire number be elected for the whole of the above-described district, one-third of whom shall go out of office on the 25th of March in each year subsequent to that in which the said election takes place.

3d. That every person, at the time of his election as a member of the Local Board, and so long as he shall continue in office by virtue of such election, be resident, as by the 16th section of the said Public Health Act (1848) is required, and be rated to the relief of the poor of some township, parish, or place, of which some part is within the said district, upon an annual value of not less than 15*l*.

4th. That 14 days previous notice of qualification, as by the 20th section of the Public Health Act (1848) is required, be given by all owners of property to entitle them to vote at the first election of the Local Board.

I have the honour to remain,

My Lords and Gentlemen,

Your most obedient humble servant,

W. RANGER,

Superintending Inspector.

The General Board of Health,
Whitehall.

APPENDIX.

Copy of Petition for Application of the Act.

Whereas by the Public Health Act, 1848, it is enacted, that from time to time after the passing of that Act, upon the petition of not less than one tenth of the inhabitants rated to the relief of the poor of any city, town, borough, parish, or place, having a known or defined boundary, not being less than thirty in the whole, the General Board of Health may, if and when they shall think fit, direct a Superintending Inspector to visit such city, town, borough, parish, or place, and to make public inquiry, and to examine witnesses as to the sewerage, drainage, and supply of water, the state of the burial grounds, the number and sanitary condition of the inhabitants, and as to any Local Act of Parliament in force within such city, town, borough, parish, or place for paving, lighting, cleansing, watching, regulating, supplying with water, or improving the same, or having relation to the purposes of this Act; also as to the natural drainage areas, and the existing municipal, parochial, or other local boundaries, and the boundaries which may be most advantageously adopted for the purposes of this Act; and as to any other matters in respect whereof the said Board may desire to be informed for the purpose of enabling them to judge of the propriety of reporting to Her Majesty or making a provisional order as mentioned in the said Act:

Now, therefore, we, the undersigned inhabitants of the township of Elland-cum-Greetland, in the county of York, and rated to the relief of the poor of and within that township (the same being a place having a known or defined boundary within the meaning of the said Act), and being one tenth in number of the inhabitants rated to the relief of the poor of and within the same township, do hereby petition the General Board of Health to direct a Superintending Inspector to visit the said township, and to make inquiry and examination with respect thereto, with a view to the application of the said Act, according to the provisions of the said Act in that behalf.

(Signed by 246 ratepayers.)

POPULATION and RATEABLE VALUE of the Township of ELLAND-CUM-GREETLAND.

Population in 1841 - - - -	6,465
„ 1851 - - - -	7,210
Increase in ten years - - -	745

The annual Rateable Value of the Property in the Township is rather more than 18,000*l.*

POOR RATE INCOME AND EXPENDITURE.

Account of the Total Number and Rateable Value of each Class of Houses in the Township.

5*l.* and under.	8*l.* 10*s.* and under.	10*l.* and under.	12*l.* 10*s.* and under.	15*l.* and under.	20*l.* and under.
873	37	10	14	6	13

	£	*s.*	*d.*
Rate allowed 14 June 1845, at 2*s.* in the pound -	1,769	15	0
„ 13 June 1846, at 1*s.* „ -	956	3	6
„ 23 Nov. 1846, at 1*s.* „ -	960	2	10
„ 26 June 1847, at 1*s.* „ -	958	15	3
„ 22 Aug. 1848, at 1*s.* 6*d.* „ -	1,386	1	6
„ 7 July 1849 - - -	1,407	18	0
„ 17 Aug. 1850 - - -	1,415	1	11
	£8,853	18	0

Average for six years from 1845, 1*s.* 9*d.* in the pound.

Total Amount paid, inclusive of the non-resident Poor.

TABLE 1.

	£	*s.*	*d.*
From 25 March 1844 to 25 March 1845 - -	947	3	11
„ 1845 to „ 1846 - -	668	11	5
„ 1846 to „ 1847 - -	609	9	4
„ 1847 to „ 1848 - -	704	11	2
„ 1848 to „ 1849 - -	721	13	3
„ 1849 to „ 1850 - -	437	11	5
„ 1850 to „ 1851 - -	375	12	1

Number of resident poor in the receipt of relief on 25th March 1850 - - - - -	152
Ditto, on 25th March 1851 - - -	118
Decrease - - -	34

An Account of the Amount of Relief paid on account of Sickness to Persons residing in the Township of Elland, for the last seven years, exclusive of all relief on account of accidents or medical officers fees.

TABLE 2.

	£	s.	d.
From 25 March 1844 to 25 March 1845 - -	25	7	8
„ 1845 to „ 1846 - -	43	18	3
„ 1846 to „ 1847 - -	35	6	6
„ 1847 to „ 1848 - -	47	13	3
„ 1848 to „ 1849 - -	51	8	0
„ 1849 to „ 1850 - -	31	0	0
„ 1850 to „ 1851 - -	31	12	8
	£266	6	4

EXPENDITURE of the HIGHWAY SURVEYORS for the last six years.

	£	s.	d.
From March 1845 to 1846 - - -	950	19	0
„ 1846 to 1847 - - -	1,081	19	5½
„ 1847 to 1848 - - -	1,303	15	8½
„ 1848 to 1849 - - -	1,019	18	8
„ 1849 to 1850 - - -	953	11	0½
„ 1850 to 1851 - - -	948	14	10
	£6,258	18	8½

AMOS CROWTHER,
Clerk to the Board of Surveyors.

Elland, 1*st May* 1851.

MEDICAL EVIDENCE.

Mr. *Hamerton,* surgeon, observed, "That he had practised in Elland for 35 years, and that on the whole he considered the place a healthy one. Epidemics were not frequent, though they were visited by such as were prevalent in the neighbourhood. The town was not visited by cholera, but it was only fair to state that all possible precautions and means of prevention were adopted to guard against its attacks. He had not met with a case of typhus for two years, but fevers of a typhoid type were not unfrequent.

"There were many improvements required, however; for instance, the drainage was far from good, many of the narrow streets and lanes required attention, and the privy accommodation was insufficient and bad in point of arrangement and construction. The town also stood greatly in need of lighting. He considered also that the burial ground was overcrowded. He believed that considerable improvement had taken place since the visit of the

Inspector of Nuisances. On the whole he fully concurred in the statement made by Mr. Smith to the Registrar General, relative to the mortality, which appeared in his Report for 1847."

Mr. *Slater*, surgeon, stated, "That he would in a great measure confine his evidence to an account of the places where epidemics were generally to be met with. These were New-street; Gog-Hill, where the drainage from the upper part of the town fell over the surface of the rock, and polluted one of the principal springs in that quarter; Rose-and-crown-yard, a narrow alley in North-street, where he had some of the worst cases of diarrhœa; the Work-house Fold in Southgate, and Taylor's-buildings; the last-named premises were in an excessively bad state, and the privy accommodation was most defective. He knew from experience that the mortality amongst the children in this yard was threefold that of any other part of the town, and rheumatic fever was also very prevalent amongst the grown-up part of the population. There had been cases of typhus in Stansfield's-buildings, particularly in a house adjoining some privies, in Timber-street, in John Brooks' Field, and in the houses next to Spawell Mill. There had been fever and diarrhœa in Beaumont's-buildings, Church-street, Castle-gate, Gibraltar, Quebec, Marshall Hall, and Elland Bank. There was a general want of privy accommodation in the dwellings of the poor; and the ventilation of their sleeping-rooms particularly was most insufficient. He considered a proper system of public lighting was also much to be desired."

Mr. *Hiley*, surgeon, said, "That he had practised in the town for 11 years, and acted as the medical officer of the Union district for nine years. He considered on the whole that the town was healthy; it has been greatly improved by the application of the Nuisances Removal Act to some of the worst places in it. He perfectly agreed in the remarks of Mr. Hamerton and Mr. Slater, and could bear his testimony to the existence of epidemic disorders in the places mentioned by the latter of these two gentlemen. He had remarked, in times of commercial depression, and consequent want of employment amongst the working people, there was always a much greater tendency to epidemic disorders than when business was good, and work plentiful. He quite agreed in the remarks that had been made on the defective privy acccommodation, the bad drainage of the town, and the great necessity for having it publicly lighted. The most glaring instances of overcrowding, were in Taylor's-buildings, Rose-and-crown-yard, and Hiley's-yard; and these were the localities in which fever remained the longest. On an average, he had, in the district of Elland-cum-Greetland, 300 cases of pauper sickness yearly."

Mr. *Stott Maude*, surgeon, said, "That his practice lay principally out of the town, but from what he knew of it, he was able to confirm the testimony and bear witness to the accuracy of the statements made by those of his professional brethren who had given their evidence during the inquiry."

General Evidence.

The Rev. *D. Meredith,* Incumbent of Elland, said, "That he could not speak with certainty on the state of the town, as he had only resided there for 12 months. He was not aware of the precise nature or extent of the underground drainage, but he had seen enough to convince him that it was very defective in extent, and deficient in system. There was a general want of proper cleansing, and in many places the pavement was bad and broken up into hollows, in which the water collected. The town stood greatly in need of lighting; here and there a glaring light from a shop-window might be met with, and the consequence was, that crowds of people were always gathered together in the vicinity of the light, which thus became a nuisance rather than a benefit. The narrowness of the streets rendered some general system of lighting doubly necessary."

Mr. *James W. Baker* said, "That he had taken an active share in getting up the petition for the application of the Public Health Act to the town, as he considered it would be of the greatest possible advantage, as the sewerage was in the most defective state, and the drains were filled with stagnant refuse. It would be highly advantagous if they could obtain an addition to their present water supply, for the purpose of flushing the drains, and preventing their filling up, The place also stood in great need of lighting. Many efforts had been made to obtain this desirable end, but hitherto they had all proved abortive."

Charles Pitchforth, Esq., said, "That in giving his evidence he wished it to be considered as that of a person who had lived in Elland 45 years, and who was intimately acquainted with the condition of the town, which had never, in his opinion, been unhealthy. The sewerage could not be said to be of the very best description, but the streets were generally in a tolerably clean state, though their condition would be greatly improved by their being repaired. The sewers had been constructed to carry off both the surface and the underground drainage; they were square in shape, and 18 inches in dimension. When not made in the rock, the bottoms were flagged, the sides walled, and the tops covered with flags. They were laid at various depths, from 18 inches to five feet, and cost 2*s.* 6*d.* per yard; viz.,—

	s.	*d.*
The bottom - - -	0	6
The top - - - -	0	8
The sides and the excavation -	1	0
The sets - - - -	0	4
	2	6

The privy accommodation was susceptible of great improvement. As an owner of land near Elland, he was desirous of seeing no more ground than was absolutely requisite included within the provisions of the Public Health Act."

REPORT of Mr. THOMAS SMITH, the Inspector of Nuisances.

There have been 321 nuisances reported in Elland since November 1848, consisting of accumulations of manure, offensive drains and gutters, and privies, and ashpits, requiring to be cleansed. With the exception of a few, they have all been rectified; no doubt the remainder, in the course of a short time, will also be remedied.

I find upon inspection that the back part of New-street, Elland, is in a very deplorable state, for want of drainage, so much so, that the health of the persons living in the neighbourhood will be endangered, unless some steps are taken to remove the nuisance complained of.

There are also four offensive privies and ashpits; two on the north side of Casson's-row, one in a yard on the north side of Westgate, and another in a yard near the Saville Arms. These places ought to be removed immediately; they are too near the houses, and in summer time the stench arising from them is intolerable.

Since I began acting as inspector, in January 1850, I have not had a single case to carry before the magistrates, all persons charged with nuisances having cheerfully complied with my request that they should be removed.

I do not know the number of privies and ashpits in Elland.

King's Cross, near Halifax.

REPORT by Mr. G. B. BAKER, on the general CONDITION of the STREETS and HOUSES.

The streets in Elland are not lighted, and though the attempt has been several times made it has always been defeated. The general feeling amongst the inhabitants on the two last occasions was in favour of lighting, but the disagreement arose as to the district to which it should be extended.

To defray the cost of lighting, cleaning, and extinguishing only, it was calculated that about 5*d.* in the pound would be required on the annual rateable value of the property which was to participate in its benefits.

With regard to water supply, I consider Elland well off, and as advantageously circumstanced as any of the neighbouring villages having a like population, and the complaints very few either as to its quantity or its quality. Within a radius of 700 yards from Elland Cross are to be found upwards of 50 pumps and wells, including six public springs, which furnish a supply for about 600 houses. Of the public springs one of superior quality and furnishing a large quantity has been unfortunately lost for the present by some delving operations, which have diverted its proper channel.

In the house where I reside an abundant supply of water, and of which there is nothing to complain, is pumped from a depth of about six yards; and that in Southgate, a street which is exceedingly deficient in this respect, but where any quantity might be had by sinking for.

As to drainage, I am of opinion we are sadly deficient, though few towns present such a fall for that purpose. The average depth of drains in the main streets do not average more than four feet from the surface of the street, and with a channel of about 1 ft. 6 in. by 1 ft. 3 in. In four of the principal streets, measuring in the aggregate a distance of 1,600 yards, there are not more than 104 grates fixed, and into which the sink and slop water of nearly every house facing the street is poured.

Within a radius of 700 yards there is steam power to the amount of 143 horses or thereabouts; of these

8	are condensing, of	66	horse power, supplied from back water held up in reservoirs;
3	„	57	„ - supplied from the river Calder;
3	high pressure,	20	„ - from wells in centre of Elland.
	Total	143	

Whilst on this subject I would remark, that if the more effectual combustion of smoke from factories, &c. could in any way be accomplished, it would assist materially in allowing a freer ventilation of dwellings, whose windows are now obliged to be frequently kept closed in consequence of this.

In a private street towards the top of Elland, called New-street, there are two continous rows of cottages running on for a distance of about 200 yards; of these, one range is double, and one single.

To the back of this double row, and extending about half way down, is a drain rendered quite useless by being nearly choked up for want of proper fall and outlet; the other half is still more so, the sink water and other refuse being thrown opposite the doors of the cottages, where part goes into a drain without an outlet, part is suffered to exhale and stagnate, and the overplus forces its way through the seams of a stone wall into an adjoining field, but which the occupier prevents as far as he is able by puddling up the back thereof with clay.

The effluvium occasioned by this was extremely nauseous, and was complained of to me by several of the cottagers.

On proceeding down the front side of this double row, I found no under-drain existing, and that the slop-water and other vegetable matter was poured into the channel of the street within about 2 ft. 6 in. of each cottage door, presenting an open surface ditch nearly the entire length of the street, and causing thereby a most offensive smell.

The privies for this double row of 90 houses are situated at the back, and number only 9, being also for the most part in a dilapidated state, and having the ashpits and wells in a most discreditable condition.

The single range of cottages has a shallow drain of about two feet in depth from the surface of the channel in the street, and which from its general appearance seems to have been badly constructed. The water for these dwellings is obtained from two wells in the street, affording a never-failing supply, and for which a charge of about 1*s.* 6*d.* each cottage is made annually.

If the owners of these cottages would sink two or three additional wells, build up better privy accommodation, and drain the streets, it could not fail to advance the value of their property, and confer a great boon on the occupants.

Southgate, one of the principal streets in Elland, and having a dense population in the courts and alleys leading out of it, has for the last seven years received little attention from the Surveyors of the highways, either as to its pavement or its causeways, though our highway rate is 1*s.* 3*d.* in the pound. In winter and during rainy periods the flat and uneven surface of this street has little less than the appearance of a pool of water. The accumulation of mud and filth is never taken away by a scavenger, but it is, as I have frequently seen it, swept down the drains in large quantities on each side the street, thereby tending to lessen their efficiency. The surface drainage from one or two folds and a slaughter-house run also into the channel of this street, creating a nuisance to the the public at large, and for which no proper remedy now exists.

Leading from Southgate, on an incline, is Kilnend-lane (a private road), into which large heaps of rubbish and excavations are occasionally laid. During heavy rains a portion of this is brought down into the public street, causing expense to the town, by the surveyors having to hire horses and carts for its removal.

This nuisance has been at various times a source of contention betwixt the surveyors and the then owner of a property into whose reservoir the sand and débris from this lane lodged, and to whom a sum of 10*l.* was awarded by them, about four years ago, as damages. In order to prevent a recurrence of this, it appears the said wreck is now diverted into the main sewer in Southgate; and, judging from the discussions which have taken place on this subject at the vestry meetings, it appears to me there is no remedial measure in the existing state of the law to compel the owners of this private road to alter and amend the same.

Water Supply.

The Rev. *D. Meredith* said, "That there was a great deficiency in the water supply, particularly to the poor. There were no public pumps, but there were several public wells in the town, from which the inhabitants obtained their supply. He had no supply to his own premises, but was obliged to have it brought from a well 60 yards from his dwelling house, which caused his household and himself considerable discomfort.

"He gained an additional supply from the rain water, in a well in his yard, but it was not fit for washing, cooking, or drinking."

Mr. *Slater*, surgeon, stated, "That the poorer classes, particularly those residing on the south and east of the town, were most inadequately supplied with water, which was deficient both in quantity and quality.

"The supply for Southgate was so bad that the people were obliged to go as early as three o'clock in the morning to ensure their obtaining any.

"The best spring in the town, "the Bridge-end well," was used

by a great number of persons, particularly in summer, and by cattle also; but the water was rendered unfit for use, on account of some of the sewerage of the town and waste water of a malting being discharged into it. The pollution of the water from these causes was sometimes so great that the cattle refused to touch it."

Mr. *Hiley*, surgeon, who has practised in Elland for 11 years, expressed a similar opinion to that of the last witness as to the scanty supply and unwholesome nature of the water of the wells in Southgate, to which the poorer classes chiefly resort.

Mr. *Walker*, relieving officer, stated, "That there was a great want of water throughout the town, except at Southend, where there was plenty, but it was not fit for domestic purposes. He himself was obliged to use the water from the Southend well, but it had to stand and settle before it could be used."

W. Smith, Esq., stated, "That the water of his own well was so bad, that sometimes for weeks together he could use it for nothing but scouring the floors of his house, and it was of so hard a nature that it could not be used for washing purposes. The more fully he had investigated the question, the more he was convinced that the inhabitants generally would concur with him on the great advantages of a better supply. He would further state, as his own individual impression, that all other sanitary improvements would prove of little or no benefit to the community, if a good and constant water supply were not introduced at the same time.

"He would not enter upon the question of the superior wholesomeness of soft water, but would give a rough estimate of the actual money saving which its use would, in his opinion, effect. He estimated the inmates of each house at six in number; their annual consumption, per house, of soap at 20*s.*, and of tea and coffee at 3*l.* He believed the use of soft water would reduce the outlay in soap by one half, or 10*s.*; and that in tea and coffee by one third, or 20*s.* Thus 30*s.* per house would be saved in these two items alone,—to which might also be added 10*s.* per house per annum for the diminished wear and tear of clothes; making the total saving 2*l.* per house."

Evidence of a similar kind, as to the insufficiency of the supply and the bad quality of the water available for the use of the inhabitants generally, was given by *John Maud*, *James Thornton*, *J. Lord*, and *J. H. Alsted.*

Mr. *Waddington* said, "That if the well alluded to by Mr. Baker had been still in existence, it would not have been fit to use, as the sewage which was discharged into it had completely polluted the water."

Mr. *Broadbent*, who has been a resident ratepayer in Elland for the last two years, said, "That he was very badly off for water, and that he had to fetch what he required for drinking and cooking purposes a distance of 50 yards. For washing and other domestic purposes he used rain water, collected from the roof of his house. He considered it a great inconvenience, and a source of considerable expense, to have to send such a distance to the well he had spoken of, and he believed that a constant water supply would be a great boon to the town generally."

C. Pitchforth, Esq., said, "That he was aware that the water supply was deficient in quantity, but that in quality he believed it to be as good as any that could be got in the neighbourhood, and that an abundant quantity might be obtained by sinking some additional wells. He would engage to make a hundred of them, if necessary, for 10*l.* each."

P. Hillam said, "That he had been in the habit of getting his daily supply from the well in Southgate during the last ten years. The water is muddy in summer, but it becomes clear after standing for a short time. He carries home about three and a half gallons every day, and this he uses for cooking and drinking; for other household purposes he takes the condensing water from a neighbouring steam engine. He would rather not see any waterworks established, for though his house is 300 yards from the well, he is not too idle to fetch from thence as much water as he requires for his family, which consist of his wife and two children."

Mr. *J. Dodgson*, dyer, said, "That he considered it would be a hardship to compel him to pay for bringing a fresh supply of water into the town, where there was a superabundance of it already, at least in the quarter where he resided. He was the owner of property consisting of his own dwelling, a public house, and two cottages. Of these, his own premises, the public-house, and one of the cottages were each provided with a pump; the occupants of the other cottage obtained their supply from his dye-works, and have to carry the water a distance of 80 or 90 yards. He did not give his evidence in favour of the existing system, from any feeling of indifference for or neglect of the comforts of those about him, because he believed he was anxious to promote every object likely to increase the well-being of his fellow-townsmen.

"With respect to the well, mentioned by Mr. Baker, it was perfectly true that it used to yield a large quantity of water, as about 60 tenements were formerly supplied from it, but since the well had been diverted, the people had been able to get what water they wanted from other places."

Mr. *James W. Baker* said, "He did not profess to understand thoroughly the merits of a good supply, but he could declare, as a water-drinker, that the Southgate water was as good as any he ever drank in his life. It could scarcely be said that the supply was abundant, but it could still less be termed deficient. Many people had water on their own premises; those who had not could get it by going a little distance for it. As an advocate of sanitary improvement, however, he should be glad to see the supply increased, if it could be done for a reasonable sum, particularly as within the last two years a well had been diverted, which formerly yielded a considerable supply.

"In the house in which he resided, an abundant supply of water, of which no complaint could be made, was pumped from a depth of about six yards; and that too in Southgate, a street which is exceedingly deficient in a good supply, but where any quantity might be got by sinking."

Report by Mr. W. Smith, on the Supply of Water from Norland Moor and Norland Clough.

Agreeable to promise and at your request, I now proceed to lay before you a Report on the Gathering-grounds on Norland Moor and its vicinity, showing the adaptation of that district for supplying water to the town of Elland.

The Moor.—The area of the Moor, having a surface and dip inclination to the point where the springs at present rise, is about 150 acres; there is, in addition to this, about the same extent of surface which has an inclination and dip to the south-east, and the rain falling on this part, doubtless, at present finds its way into the opposite valley running down from Dean Head towards Elland.

It is, however, very probable that a considerable quantity of this might be available to swell the supply at present found at the north-east part of the Moor, by driving a drift from this latter point to the south-east, through the loose, and to the bottom of the natural filtering bed, which lies immediately beneath the small bed of heath on the surface. This filtering bed is formed of loose fragments of a coarse porous grit-stone, and grey sand formed from the disintegration of the latter, and varies in thickness from several feet to three or four yards, thus forming as perfect a filtering bed as can be possibly devised.

The underlying strata is one of the series of rocks comprised in the "mill-stone grit formation." It is very porous, and has a considerable number of fissures, through which the water finds ready access and feeds the springs gushing out on both sides of the valleys. In consequence of the geological character of the district and the difficulty of obtaining materials for puddling, reservoirs could not be advantageously constructed on the Moor. All the available water from here would have to be conveyed away in pipes to another locality, where reservoirs might be constructed if necessary.

Norland Clough.—In addition to the water obtainable on the Moor, the Clough is another source from which an abundant supply may be obtained, and which has the additional advantage of affording great facilities for the construction of reservoirs, a series of which might be formed one above the other at very little expense; the lowest one would be sufficiently elevated to give a high-pressure supply to any part of the district. The rain-fall which might be collected in these reservoirs extends over 100 acres independent of the Moor, and from the precipitious nature of the district very little loss would occur from evaporation; this, together with the springs which break out at different elevations in the Clough, will form an inexhaustable supply for the proposed district.

The rain-fall is about 30 inches.

ANALYSIS of THREE SAMPLES of WATER from ELLAND, made by Dr. PLAYFAIR.

No. 1. Water from Norland Moor.

Silica, iron, and alumnia	·62
Sulphate of lime	·62
Sulphate of magnesia	·50
Carbonate of magnesia	—
Sulphate of soda	·29
Chlorides of potassium and sodium	1·12
Organic matter	traces
Total amount per imperial gallon	3·15 grains.

No. 2. South wells, a spring in Elland.

Silica, iron, and alumnia	·50
Sulphate of lime	4·43
Sulphate of magnesia	1·77
Carbonate of magnesia	·74
Sulphate of soda	·54
Chlorides of potassium and sodium	1·19
Organic matter	traces
Total amount per imperial gallon	9·17 grains.

No. 3. Appleyard's well, in the centre of Elland.

Silicia, iron, and alumnia	·70
Sulphate of lime	8·21
Sulphate of magnesia	1·63
Carbonate of magnesia	2·02
Sulphate of soda	1·05
Chlorides of potassium and sodium	2·55
Organic matter	traces
Total amount per imperial gallon	16·16 grains.

REPORT of the COMMITTEE of the ELLAND-CUM-GREETLAND GAS LIGHT AND COKE COMPANY.

April 1851.

Your committee rejoice that in presenting their annual report on this occasion the hopes they held out to the shareholders last year, have not been disappointed. All rent due from the lessee has been paid up, and from the accounts, to which your committee beg to request your attention, and which you will find annexed to this report, it will be seen that besides discharging all old balances due to various parties from the Company, your committee have expended in new pipes and meters the sum of 77*l.* 14*s.*, and have reserved 38*l.* 16*s.* 1*d.* to meet an account due for iron pipes already laid, but which account has not yet been discharged.

Your committee find that there is a balance in hand of 267*l.* 9*s.* 1*d.*, out of which they recommend the shareholders to declare a dividend of seven shillings per share, in accordance with the provisions of the deed of settlement by which the Company is incorporated.

Your committee have had the share register carefully examined, and by a comparison with the scrip issued, they have ascertained that some of the shareholders are in want of a part of their certificates, so that it will be necessary for the certificates in possession of the shareholders to be produced at the annual meeting, to be held on Wednesday the 7th of May, at the house of Mrs. Hanson, New Inn, Elland, at two o'clock in the afternoon. Your committee recommend that the dividend to be declared be paid at the close of the annual meeting.

From the examination referred to, the committee find that the number of existing shares is 707, so that after payment of the dividend, there will be a balance in hand to meet contingencies of 20*l.* 9*s.* 1*d.*

Your committee congratulate the shareholders on the greatly improved condition of their affairs, and upon the prospect of a more frequent and regular dividend for the future.

JOSHUA WADDINGTON, jun.,
Chairman.

To the Shareholders of the Elland-cum-Greetland Gas Light and Coke Company.

REPORT by the Rev. D. MEREDITH, on the CONDITION of the CHURCHYARD.

Burial Ground at Elland Church.—The churchyard has been appropriated to the burial of the dead at three different periods. The upper part, containing 2,715 square yards, has been attached to the Church it is supposed from its consecration, that is from time immemorial; the lower part, on the north side, containing 828 square yards, was enclosed in 1804; and the lower part, on the south side, containing 580 square yards, in 1844. The number of bodies deposited in this ground during the last 300 years, is close upon 30,000.

The following Table gives the average in the different registers of burials in my possession.

			No. buried.
Register	No. 1.	1559 to 1640, 81 years -	6,075
„	No. 2.	1641 to 1653, 12 years -	1,682
„	No. 3.	1654 to 1670, 16 years -	1,744
„	No. 4.	1671 to 1713, 42 years -	5,712
„	No. 5.	1714 to 1764, 50 years -	4,700
„	No. 6.	1765 to 1799, 34 years -	5,202
„	No. 7.	1800 to 1812, 12 years -	1,044
„	No. 8.	1813 to 1843, 30 years -	2,400
„	No. 9.	1844 to 1851, 7 years -	548
Total number of burials registered in 292 years, from 1559 to 1851 - - -			29,107

The average number of interments for the last 50 years is 80, and for the last seven years 69. The average decreases from the circumstance of there being many other burial grounds in the chapelry which did not formerly exist. The number of burial grounds, exclusive of the churchyard, within the district to which the Public Health Act may be applied is five ; viz., one at each of the following chapels : Old Connexion of Methodists, New Connexion of Methodists, Independent chapel, Baptist chapel, (now closed), and Unitarian chapel. I have no means of ascertaining the number of interments in any of these places.

The ground in the churchyard is good and dry. In the upper part, there is about three feet of dark-coloured soil, below which is about two feet of gravelly earth, here called rag, from its being tattered rock. Underneath this lies the solid rock. There is neither water nor clay in any portion of the old ground. In no part of it, however, can a grave now be dug without coming in contact with human bones; there are few old graves where the remains are deeper than four feet. The ground in the lower part, and on the east side of the yard, consists of about three feet of earth, with a subsoil of nearly two feet of clay scale ; no water appears at the bottom of the graves. The general depth of a new grave in this part is seven feet, the cost of digging it being 5*s.* 6*d.* The digging of a small grave, four feet deep, costs 1*s.* 9*d.* The usual fees for interments are as follows :—

	£	*s.*	*d.*
The minister's fee for a walled grave or vault in the churchyard - - - - -	2	2	0
Funeral service - - - - -	0	1	0
Morning funeral - - - - -	0	2	0
Clerk - - - - - -	0	0	6
Bell tolling - - - - - -	0	0	3

Besides the interments in the yard, there is scarcely any part of the ground inside the church which is not occupied with graves or vaults. It would be difficult to find a place for a new vault ; and though it is very undesirable to have interments inside a church, it would be difficult and painful to prohibit families from opening afresh those vaults where their friends have been deposited, unless the law prohibited them. It ought to be mentioned that the churchyard on the south side is bounded at the western end by a street, and at its eastern extremity by some houses ; most of this side of the ground is above the level of the street and the houses.

The bottom of a grave is higher than the street, or even the floor of the houses ; and this cannot but be prejudicial to health.

From the statement I have already made, it appears that within the last 300 years about ten bodies have been buried in every square yard of the old part of the churchyard and the church. It is not known how long previous to the above date interments took place in this same ground ; but there is no doubt that both the church and the yard are of very ancient date. The great number of burials will account for the depth of the dark-coloured earth in the old ground.

REPORT by Mr. J. W. BAKER, on the STATE of the BURIAL GROUNDS in connexion with the various Dissenting Chapels in the Township.

First, the Old Wesleyan Methodist chapel, built in 1808, measures 596 yards of burial surface, and from that period up to the present there have been 427 interments; the chapel-yard is surrounded by dwellings, and at the east side of it there is a cellar house considerably below the burial ground.

Providence chapel, built in 1822, contains 364 yards of burial surface; and as there is no correct register of interments, except for the last five years, during which period there were 52, I therefore make it, taking the average of ten annually, to be 280; there are dwellings contiguous on the north and east sides of it.

The Methodist New Connexion chapel, built in 1825, contains 300 yards of burial surface, and the number of interments is 226; there are three dwellings in the chapel-yard, and adjoining to the chapel, besides other houses in the same locality.

The Unitarian chapel has recently been re-opened for divine worship, having been closed for a considerable period; there are 60 yards of burial surface; the number of interments I am not able to ascertain, as the register and all other matters in connexion with the chapel are deposited at Somerset-house, in consequence of an order from Government respecting chapels of that description. If any further information is necessary I shall be happy to furnish it.

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