

**PUBLIC HEALTH ACT**  
(11 & 12 Vict. Cap. 63.)

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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  
**S H I P L E Y,**  
IN THE COUNTY OF YORK.

By **WILLIAM RANGER, Esq.,**  
SUPERINTENDING INSPECTOR.



LONDON :

**PRINTED BY GEORGE E. EYRE AND WILLIAM SPOTTISWOODE,**  
PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY,  
FOR HER MAJESTY'S STATIONERY OFFICE.

1852.

## NOTIFICATION.

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THE General Board of Health hereby give notice, in terms of section 9th of the Public Health Act, that on or before the 10th day of January 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 SHIPLEX, in the County of York ; or with respect to any amendment to be proposed therein.

By order of the Board,

C. MACAULAY, *Secretary.*

*Whitehall, 24th November 1852.*

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

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*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 SHIPLEY, in the County of York. By WILLIAM RANGER, Esq., Superintending Inspector.*

*London, 2A, Pall Mall, 22d July 1852.*

**MY LORDS AND GENTLEMEN,**

I HAVE the honour to lay before you the following Report on the sanitary condition of the township of Shipley, at which place I recently held a preliminary inquiry, in accordance with the provisions of the Public Health Act.

The following is a copy of the Petition presented to your Honourable Board by the ratepayers:—

“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 Acts 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 that 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 that 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 town or township of Shipley, in the parish of Bradford, in the county of York, and rated to the relief of the poor of and within that town or township, do hereby petition the General Board of Health to

direct a Superintending Inspector to visit the said town or 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 137 ratepayers.)

The total number of ratepayers in the township does not exceed 693, so that the inquiry has been instituted at the request of nearly one fifth of the rated inhabitants.

OPENING OF THE INQUIRY.—Printed notices of my visit having been duly circulated in the district, I proceeded to Shipley, and opened the inquiry in the large room of the Odd Fellows' Hall. Before commencing proceedings, I received from Mr. Thomas West a written certificate that he had affixed printed notices of the inquiry on the doors of the Parish church, the Baptist chapel, the Methodist chapel, the Primitive Methodist chapel, and the preaching room of the Wesleyan Reformers, all of which places of worship are situated in the township of Shipley.

GENERAL DESCRIPTION.—Shipley is about four miles distant from the populous and rapidly increasing borough of Bradford, and, as might be expected, has largely participated in the growing importance of that town.

It is also most favourably situated for the erection of manufactories and the like, as it is intersected by the river Aire, the Leeds and Liverpool canal, and the Leeds and Bradford railway, which has here a junction with the line to Manchester in one direction, and to Lancaster in another. The readiness of communication with Bradford also has of late attracted the attention of persons wishing to live at a little distance from that town, who have accordingly purchased building sites and erected villa residences in the township.

The population of Shipley will soon be nearly doubled, for Mr. Salt, one of the principal manufacturers in Bradford, is now erecting a very large mill, as well as extensive weaving sheds, in Shipley; in addition to which there are to be built, in the immediate vicinity of these business premises, from 200 to 400 dwelling-houses for the people connected with the works, a place of worship, and a music hall.

As might be expected, in a place of such rapid growth as Shipley, which has suddenly changed from an almost exclusively rural village to a place of considerable manufacturing importance, there is no Local Act or form of local government; and the highway surveyors are the only

body exercising any jurisdiction with respect to sanitary matters.

The evidence I received during the inquiry was not of sufficient extent to justify me in placing it in an Appendix, and I have therefore embodied the whole of it in the Report itself.

POPULATION, NUMBER OF RATEPAYERS, MORTALITY, &c.—  
The population of Shipley was,—

In 1831	-	-	-	-	1,926
1841	-	-	-	-	2,413
1851	-	-	-	-	3,272

The rapidly increasing population of the place is evident from the fact, that whereas the increase from 1831 to 1841 was only 487; from 1841 to 1851 it amounted to 859; or at the rate of about 86 annually.

The following is a list of the ratepayers, and the sums at which each class is assessed :—

23	Ratepayers assessed under	-	-	£1
97	"	"	at £1 and under	2
198	"	"	at 2	" 3
152	"	"	at 3	" 4
40	"	"	at 4	" 5
28	"	"	at 5	" 6
16	"	"	at 6	" 7
16	"	"	at 7	" 8
14	"	"	at 8	" 10
11	"	"	at 10	" 12
18	"	"	at 12	" 15
10	"	"	at 15	" 20
70	"	"	at and above	- 20

693

The greater portion of the ratepayers assessed at more than 20*l.* are farmers residing in the exclusively agricultural portion of the district, to which I did not consider it a part of my duty to extend the inquiry.

The number of dwelling-houses is stated to be 664, so that there are on an average nearly five persons to a house.

The following is a return of the total mortality of the township from 1844 to 1851 :—

Quarter ending	31st December 1844	-	-	16
"	31st March 1845	-	-	15
"	30th June	-	-	20
"	30th September	-	-	24

*The Mortality of the District.*

Quarter ending	31st December	-	-	12	
"	31st March 1846	-	-	22	
"	30th June	-	-	21	
"	30th September	-	-	21	76
					<hr/>
"	31st December	-	-	9	
"	31st March 1847	-	-	23	
"	30th June	-	-	19	
"	30th September	-	-	18	69
					<hr/>
"	31st December	-	-	16	
"	31st March 1848	-	-	25	
"	30th June	-	-	19	
"	30th September	-	-	11	71
					<hr/>
"	31st December	-	-	16	
"	31st March 1849	-	-	22	
"	30th June	-	-	25	
"	30th September	-	-	21	84
					<hr/>
"	31st December	-	-	16	
"	31st March 1850	-	-	27	
"	30th June	-	-	18	
"	30th September	-	-	19	80
					<hr/>
"	31st December	-	-	13	
"	31st March 1851	-	-	23	
"	30th June	-	-	46	
"	30th September	-	-	33	115
					<hr/>
					570
					<hr/> <hr/>

Or an average of 81·4 deaths per annum during the last 7 years.

The following shows the comparative rate of mortality during the same period. The average rate of increase being taken at 86 :—

Years.	Population.	Deaths.	Rate of Mortality per 1,000.
1844-5	2,756	75	27·2
1845-6	2,842	76	26·8
1846-7	2,928	69	23·5
1847-8	3,014	71	23·5
1848-9	3,100	84	27·0
1849-50	3,186	80	25·1
1850-51	3,272	115	35·1
			188·2

Or, on an average of 7 years, 26·9 per 1,000 annually.

The following is a detailed return, furnished by Mr. Thomas West, registrar, of the mortality from all causes during the years 1849, 1850, and 1851 :—

1. Zymotic diseases :—		
Small-pox	- - - -	13
Measles	- - - -	8
Scarlatina	- - - -	43
Hooping-cough	- - - -	4
Croup	- - - -	3
Diarrhœa	- - - -	10
Dysentery	- - - -	1
Cholera	- - - -	6
Remittent fever	- - - -	2
Infantile do.	- - - -	2
Typhus	- - - -	5
Syphilis	- - - -	1
		<hr/>
		98
2. Dropsy, ulcer, and cancer	- - - -	8
3. Tubercular diseases	- - - -	43
4. Diseases of the brain, spinal marrow, nerves, and senses	- - - -	43
5. Diseases of the heart and blood-vessels	- - - -	2
6. Diseases of the lungs, and of the other organs of respiration	- - - -	25
7. Diseases of the stomach, liver, and other organs of digestion	- - - -	6
9. Childbirth, diseases of the uterus, &c.	- - - -	2
13. Premature birth and debility	- - - -	14
14. Atrophy	- - - -	1
15. Age	- - - -	10
17. Violence, privation, cold, and intemperance	- - - -	6
Causes not specified	- - - -	40
		<hr/>
		298
		<hr/> <hr/>

On comparing the above return with the general statement of the mortality, it will be found that there is a slight difference in the two; but this is caused by the former table extending to the end of September 1851, whereas the other includes the quarter ending in December of the same year.

Both returns, however, show most conclusively that the average mortality is remarkably high, and that during the last year the number of deaths was greater than during any previous period, since 1844 at least.

I shall have occasion to allude to the amount of mortality in a subsequent part of my Report; and I shall at present,

therefore, only draw attention to the large number of deaths from zymotic diseases in the last three years. It will be seen that these are no less in number than 98, or about one third of the total mortality of the district for the same period; and out of these 98 deaths, 76 (or nearly four fifths) are those of persons under 15 years of age.

In the 98 deaths from zymotic diseases, 43 have been caused by scarlatina,—an epidemic particularly virulent during last year, and which was found to number the greater part of its victims in those quarters of the township which most exhibited an entire absence of all sanitary arrangements or regulations.

In a Report recently presented to your Honourable Board upon the condition of Barnsley, I instituted a comparison between the proportion of deaths from zymotic diseases in that place as compared with some other towns in the locality. If a comparison of a similar kind be extended to Shipley, it will be found to place the latter in a very unfavourable light; the proportion of zymotic diseases being higher in it than in any other place, except Barnsley.

The following list will show the proportion of deaths from zymotic causes to the total mortality in the following towns:—

Halifax, in 1850	- - -	28	per cent.
Dewsbury, on an average of 7½ years,		23·5	„
Wakefield, on an average of 7 years,		20·5	„
Barnsley, on an average of 3 years,		34·3	„
Shipley, on an average of 3 years,		32·9	„

The amount of mortality from zymotic diseases is considered to afford a fair index of the sanitary condition of any place in which such a comparison may be instituted; for experience has proved that zymotic diseases are precisely those whose virulence is increased by the want of proper drainage, the neglect of scavenging, and the absence of pure air and good water,—or in other words by the want of those things which it is the object of the Public Health Act to promote and encourage wherever they may be found to be either wanting or defective.

In support of these remarks I may be permitted to quote the following letter from Wm. Brumfit, Esq., a medical practitioner resident in Shipley, who was compelled to be absent during the inquiry; and who, therefore, addressed to me a written statement on the general condition of the district.

**Mr. Brumfit**, after expressing his regret at not being able to attend personally, goes on to say,—

“ If a plentiful supply of wholesome water were brought into the town, in connexion with a thorough and proper system of sewerage and house drainage, many of those epidemic visitations to which this and other adjacent districts have been latterly subjected might be in a great measure obviated, or their virulence diminished. It has been long recognized as a principle amongst medical men, that wherever local nuisances abound, such as are to be met with in this district, in the form of obstructed sewers, accumulations of refuse, pigsty nuisances, &c., these epidemic diseases batten, and assume a peculiar virulency, independent of the causation of endemic diseases, or those generated upon the spot by such nuisances.

“ I have repeatedly proved the truth of these arguments by my own private observations, during the prevalence of epidemic ailments in this and the neighbouring districts, and I have no hesitation in affirming that if a proper system of sewerage and water supply were adopted, and the abolition of the existing nuisances carried out, the engenderment and fatality of disease generally might be most materially diminished.”

**Mr. Brumfit's** statement fully bears out the truth of the established fact, that disease is aggravated and increased by the want of cleanliness, and the absence of works of sewerage and water supply, whilst the evidence of the following witnesses will show to what extent these essentials to health and comfort are needed in the district to which the present Report refers.

**Mr. Rhodes**, a farmer and land agent, and also a ratepayer of 28 years standing, stated,—

“ That in some parts of the district he considered the drainage was good, and in other parts bad.

“ There was a main sewer commencing in Low-lane, and another in Chapel-lane, both of which had their outfall into the Bradford beck, near the south end of the Union mill. The lane sewer, which was constructed by the highway surveyors, was laid at a depth of from three to five feet below the surface; it was square in form, and laid in dry brick. There were houses on both sides of the lane, but the sewer was not laid at a sufficient depth to drain the cellars. At one part of its course, the sewer had so slight a rate of inclination, that it was constantly getting clogged up with sand, ashes, and other kinds of solid refuse. This part of it required opening and cleansing about once a year. Many of the house drains in this part of Low-lane did not communicate with the sewer, but were connected with another belonging to a private individual, who had given them permission to do so. Its contents were discharged into the Leeds and Liverpool canal.

“ There is a second main sewer, which has its outfall in a pond near the canal bridge ; the water from this pond is applied to the land adjoining it. The drain is square shaped, and two feet by two feet six inches. It carries off surface water only. Complaints are made of the bad smells from the gully-holes, but nothing has been done to remedy the evil. It is laid dry, in fact none of the sewers are constructed in either brick or mortar.

“ The continuation of this sewer from Hall’s-buildings to Hudson’s-fold, is quite insufficient to carry off the refuse matter from the houses. The drain is about 18 inches square, but it has to be frequently cleansed. Between the railway bridge and Lane-end there is a large block of houses, the refuse of which ought to be carried off by this sewer, if it answered its intended purpose. Some of the houses only have drains in connexion with the sewers.

“ The third main sewer commences at the Sun inn, and extends to New York-buildings. This sewer also is quite insufficient to carry off the refuse, and like the rest it is so liable to become choked, that it has to be opened and cleansed out once a year.

“ There is also a tributary sewer to the one just mentioned.

“ The house drains are generally about one foot square.”

The Rev. *Wm. Kelly*, the Incumbent of Shipley, said,—

“ That there was a great and general scarcity of water not only amongst the working people, but amongst the middle classes of the population. It was no unusual thing to see the people standing for an hour, or an hour and a half, at Hall-lane, where there was a public well, endeavouring to procure a small supply of water. The water that the people could obtain was extremely hard, and they were compelled to use rain water for making tea and for culinary purposes generally.”

Mr. *Rhodes* said,—

“ That there were no waterworks, and only two pumps, from which the people could obtain a gratuitous supply. One of these was called the Low-well, the other was known as the Hall-lane well. There were other shallower wells in different places, but they yielded a supply which was indifferent both as regarded quantity and quality.

“ The number of private pumps was extremely small throughout the whole of the town. In that part of it which lay to the east of the Bradford and Otley road, and between the railway and the canal, as far as the Union mill, there were but six private pumps. Three of them were intended for the supply of the particular house to which each of them was attached, the fourth supplied three houses, the fifth four, and the sixth eight houses. The occupants of all the other houses in this district were obliged to go to the public, or Low-well, or else to bargain for the water of one or other of the private pumps above mentioned. Nearly all the houses on both sides of Low lane were obliged to procure their supply in this manner.

"In that portion of the town lying on the west side of the Bradford and Otley road, and bounded on the north by the canal, there were but eight private pumps. Four of these supplied but one house each, the other four were erected for the common use of the tenants of houses. The rest of the inhabitants were obliged, like those on the other side of the turnpike road, to take the water from these pumps or to go to the Hall-lane well for it.

"The greater part of the pumps had been dry in consequence of the great drought at the end of 1851 and the beginning of 1852. Some of them, indeed, had been dry for several months past.

"A penny a week was charged to all persons taking water from the private pumps. They could take as much as they could get for this sum, but they were obliged to undergo considerable labour in procuring it."

Mr. G. Knowles, architect and surveyor, said,—

"That he had made a cursory examination of the district, with the view of discovering a better supply of water, and had found two sources.

"There were 864 houses in Shipley, and it was expected that the extensive building operations then in progress by Mr. Salt would increase this number by 400 dwellings more. He considered that at the very least a supply should be obtained capable of supplying 1,000 houses. At Bradford the water company supplied their customers at the rate of 15 gallons per head per day."

The Rev. Mr. Kelly said,—

"That there was a great want of privy accommodation, and that some portions of the township were in a very dirty and offensive condition."

Mr. Henry Farrer furnished me with the following information respecting the public lighting of the district:—

"I am one of the inspectors for lighting the streets with gas, under a certain Act of Parliament passed in the 3d and 4th year of William the Fourth, intituled 'An Act to repeal an Act of the 11th year of His late Majesty George the Fourth, for the lighting and watching of parishes in England and Wales, and to make other provisions in lieu thereof.' This Act was adopted in Shipley two years ago, when 75*l.* was granted by the ratepayers to provide gas for the lamps for one year, and also to pay the first expense of the pillars, brackets, lamps, &c. The smallness of the sum prevented the inspectors from lighting the town otherwise than very imperfectly.

"In the year 1851 the same sum of 75*l.* was granted, but as it was far too little for the purposes required, a private subscription was entered into for the erection of additional lamps where they were most required.

"In January of the current year the sum of 85*l.* was granted to defray the expenses of the lighting. The number of the lamps

is now 39, but if the district were lighted properly, it would require at least half as many more.

“The inspectors have at all times experienced considerable difficulty in carrying out the provisions of the Act under which they are appointed, in consequence of many of the clauses being contradictory ; so that in some cases the Act is rendered nearly inoperative.

“In consequence of these and other difficulties the inspectors have long wished for some other means of empowering them or any other body to effectually light the streets of this rapidly increasing village. They therefore think that the adoption of the Public Health Act would be of great service to Shipley and the neighbourhood.”

BURIAL GROUNDS.—On pages 15 and 16 is the evidence which I received from the incumbent of Shipley, and the ministers of the two dissenting chapels, respecting the condition and nature of the burial-grounds in Shipley.

As the evidence on the condition of Shipley, with respect to its means of water supply and drainage, is of so limited a nature, I have preferred quoting it continuously ; I shall now proceed to make some few observations upon the above statements, and upon the general condition of the district.

And first I may remark, once for all, that the result of the personal examination which I made during the inquiry was such as to enable me to state my perfect agreement in the evidence both of the Rev. Mr. Kelly and Mr. Rhodes. So far indeed from either of those gentlemen having exaggerated the want of water supply or drainage, they might in my opinion have made their evidence much stronger, and yet confined themselves to terms of the strictest accuracy

But whilst making this observation, I am anxious at the same time to point out that a general absence of drainage or water supply is almost inevitable in a town like Shipley, when the population has increased with so much rapidity, and which has, in the course of a few years, grown from a village into a place of considerable manufacturing importance.

In one respect, however, Shipley is perfectly unchanged ; when an agricultural village, the highway surveyors repaired and cleansed the roads ; and now, when it is a seat of manufacturing industry, the highway surveyors still remain the only executive body to manage all matters of a sanitary nature at least, although the population of the town has so much increased, and the whole character of the place has become completely altered.

Burial Grounds in Salisbury.

QUESTIONS.	SHIPLEY CHURCH.	WESLEYAN CHAPEL.	BAPTIST CHAPEL.
1.—The area of the ground?	One acre, exclusive of the portion occupied by the church.	About 180 square yards, including vaults.	About 965 square yards within the fence.
2.—The nature of the soil?	Sandstone rock partly, and partly a dry sandy soil.	Clay and gravel.	Sandstone and gravel.
3.—The number of interments from its opening to the present time?	Commencing December 1826, 900 up to 31st December 1851.	Not known.	On account of the loss of a book or books this question cannot be fully answered; but since September 1827 till January 1852, there have been 1,596; before the former date the number was comparatively small.
4.—The depth of the graves?	10 or 12 feet deep, and vary as the graves are filled up.	From 3 to 10 feet.	They vary from 5 to 14 feet.

## Burial Grounds in Shipley—continued.

QUESTIONS.	SHIPLEY CHURCH.	WESLEYAN CHAPEL.	BAPTIST CHAPEL.
5.—The tables of fees paid?	The clergyman's (including clerk's) fee for a funeral within the district is 3s. If the ground be purchased, the charge for a large grave is 17. 15s. Fees are added to parties non-resident in the district.	2s. 6d. each.	For infants 1s., for adults 2s. 6d.
6.—If houses are on either or all sides, or buildings, and how near?	The parsonage is the only house adjoining the churchyard, except a few small cottages; there are no other houses very near.	A large mill at one side; no houses nearer than the breadth of the street.	On the west side there are a few cottages, at a space of 9 or 10 inches, and a wall; on the north is Chapel-lane, averaging about 4½ yards wide, on the opposite side of which are cottages; on the east is the chapel; and on the south, a high wall and a field.
7.—If any and what area of unoccupied ground?	Some of the area of the ground is yet unbroken in detached patches, so that the extent is not easy to calculate; there is, perhaps, one sixth of the ground left.	About 91 yards.	None.

In the discharge of my duty it is requisite I should give, as far as I am able, a true and faithful picture of the state of the township; but I feel also that in the present instance it is better to suggest remedies for its future improvement than to dwell at length upon cases of defective sewerage and insufficient house drainage, which have probably arisen from the want of adequate powers to enable owners of property to lay down either the one or the other. For the same reason also, I consider it more advisable to point out the discomforts arising from a scanty supply of water, than to condemn its general deficiency amongst all classes of the population at Shipley at the time of the inquiry.

**THE SEWERAGE AND DRAINAGE.**—It will be perceived from the detailed description which Mr. Rhodes has given of the sewerage of the district, that not one of the common sewers now existing fully answers its intended purpose. One is too small to carry off the refuse discharged into it,—another is laid at so slight an inclination that it is being continually choked up,—and a third is constructed at so trifling a depth below the surface that none of the refuse from the neighbourhouring houses can pass into it, unless it be thrown on some gully-hole or grating.

Nor are these the only defects in the existing sewers, for it has been stated by Mr. Rhodes, that they are laid dry, so that the liquid portion of their contents can freely permeate and saturate the subsoil around them. Finally, with respect to the outfall, the present sewers empty themselves into the Bradford beck, or the Leeds and Liverpool canal; so that in either case these watercourses are polluted to a considerable extent by the discharge of sewage matter.

It is, at the same time, but right to mention that the Beck, and the Canal, between Bradford and Shipley, which is supplied with water from that stream, are largely charged with offensive refuse before they reach the latter place, as the Beck receives a large portion of the sewage of Bradford.

The ratepayers of Shipley cannot of course interfere with this arrangement, but the fact of its existence may be used as an argument for the necessity of steps being taken to prevent the Beck and the canal from receiving the offensive refuse of Bradford, and becoming in consequence so polluted as to be a source of annoyance and discomfort to the inhabitants of the populous districts through which they pass. And even if no means are taken to cleanse the upper part of the Beck and canal, it is most important that the Shipley Local Board should be armed with power

to keep both in a wholesome state, in those portions of them at least which are situated within their district.

There can be no doubt that many, if not all, of the existing defects have been occasioned in consequence of the sewers not having been originally laid down on any common system, or in accordance with any proper principles. They appear, on the contrary, to have been constructed and extended from time to time as the exigencies of the case, or the rapidly increasing number of the dwelling-houses, demanded. It must not, therefore, occasion surprise that they should present one and all of the defects already mentioned.

The main sewerage of the district being such as I have described, it necessarily follows that the house drainage is of the most imperfect and inadequate kind. In but few cases are the drains intended to carry off any but the waste water of the houses, for the owners of property have not in general contemplated the removal of the house refuse by means of the drains connected with the sewers. Indeed, as has been already shown by Mr. Rhodes, the nature of the sewerage would not, in the majority of instances, permit of such an arrangement.

In the houses of the working classes, there is a very general absence of drainage of any kind, and the people are therefore compelled to throw the liquid refuse in front of their dwellings, or carry it to the nearest gully-hole opening into the sewer.

But if the Public Health Act be applied to the district, and if its provisions be put in practical operation with respect to sewerage and house drainage, these works must be laid down on very different principles to those now existing. As regards the sewers, it will be necessary,—

1st. To construct them at such a depth below the surface, that the sewage may be carried off from the lowest story of every house.

2d. To lay them at such an inclination that their contents may be carried off rapidly and effectually, whilst their dimensions must not be greater than what are absolutely necessary to ensure full efficiency in the sewers.

3d. To construct them of impermeable materials, so that no portion of the sewage may escape through the sides and infiltrate the surrounding subsoil.

4th. The Local Board will have to select such a point for the outfall of the sewage, that it may be converted to profitable uses, instead of polluting, as it now does, the waters of the Bradford beck, or the Leeds and Liverpool canal.

Similar general principles must be followed in connecting the house drains with the sewers, for the latter will prove of little or no benefit in promoting the comforts, or improving the health of the population, unless the former are rendered efficient.

Finally, it is essential that the strictest economy should be practised in carrying out the sewerage and house drainage, not only on account of the limited extent and resources of the district under consideration, but also because it is useless to expect that general or extensive improvement works will be carried out by owners of property, unless they can be convinced that they will ultimately gain by such outlay of their capital.

With regard, however, to the cost of laying down works of sewerage and water supply, there is a very general and erroneous impression as to the outlay that these will require; persons are apt to estimate the cost of them under the Public Health Act by that of large brick sewers of the ordinary construction. So far is this from being the case, that I am enabled to state, from my own personal experience, that in a district of very limited extent (in which complete works of sewerage, house drainage, and water supply are now being carried out under the provisions of the Public Health Act, and in accordance with the general principles I have already laid down), the entire cost of the rates for efficient sewerage and house drainage, as well as an unlimited and constant supply of pure water, will not exceed the sum of  $2\frac{1}{4}d.$  per house per week.

**THE WATER SUPPLY.**—All the witnesses, who alluded to the subject at all, have spoken of the scanty and insufficient nature of the present water supply. Nor is this scarcity confined to the working population alone, for all classes feel it in a greater or less degree.

There are but two public wells from which a gratuitous supply of water can be obtained; and, from the scarcity of water in all parts of the place, these are called upon to supply more than they will yield. Persons may be seen standing round these wells for hours together, endeavouring to obtain a gallon or two of water; and to secure even this scanty allowance they are compelled to go to them at all hours of the day and night.

Even with regard to private pumps, the scarcity is almost as great. Thus, in that very considerable portion of the town lying on the west of the Otley road, and bounded on the north by the canal, there are but eight pumps to which the public have access. Four of these are intended for the

use of the four houses to which they are attached, but the other four are erected for the general benefit of the tenants of the adjoining houses. Other persons are allowed to take water from these pumps on the payment of 1*d.* a week. This would be a very cheap rate to pay, if the persons who contributed it were able to get good water, or as much of it as they wanted; but unfortunately, the yield from the private, as from the public wells, is too limited for the heavy demands upon them, and the water they afford is of very indifferent quality. Many of them, in fact, were dry during the drought of last winter and the present spring, which shows that the supply is of an intermittent nature, fed exclusively from the surface water, and not depending upon any deep-seated or perennial springs. I need not say that the water from wells of this nature, which are sunk in the midst of a dense population, and in a locality where there is no drainage, must necessarily be deteriorated by the offensive matter around them.

The other part of the town as far as the Union Mill, lying to the east of the Bradford and Otley turnpike, and between the canal and the railway, is just as badly off for water, if not worse. It should be stated that this portion of the township consists for the most part of houses built closely together, and densely crowded, so that the population of this district bears a large proportion to that of the whole of Shipley. Yet in this quarter, there is only one public well (the Low-well), and six private pumps, three of them being for the supply of an equal number of dwelling-houses; the fourth is intended for the common use of three houses, the fifth of four, and the sixth of eight houses.

An analysis of a sample of water from the Low-well has been furnished to me by Professor Playfair:—

Degrees of hardness, 19·6.

Silica	-	-	-	-	·380
Iron and alumina	-	-	-	-	·080
Sulphate of lime	-	-	-	-	8·078
Carbonate of lime	-	-	-	-	3·460
Carbonate of magnesia	-	-	-	-	5·501
Sulphate of soda	-	-	-	-	3·666
Chloride of sodium	}	-	-	-	3·129
„ „ potassium					

24·294 grains per imp. gal.

Under the present circumstances of the water supply therefore, it follows that the quantity to be obtained from

the well is altogether insufficient for the domestic wants of the people, and that an improved source must be adopted, before the private wants of the town can be satisfied; I need not say also that a constant and much larger supply will be demanded for the various public uses of the district, if the provisions of the Act are to be properly carried out, as water will be needed for flushing the sewers and house drains, for watering and cleansing the streets, and for the extinction of fires, if unfortunately it should at any time be needed for the last-named use.

Two sources were suggested to me by Mr. Knowles, a professional gentleman, who furnished me with some evidence on the water supply.

The following analyses of samples from these two sources have been furnished to me by Dr. Playfair:—

Water from Source, No. 718.

Degrees of hardness, 9°6.

Silica	-	-	-	·500
Iron and alumina	-	-	-	·060
Carbonate of lime	-	-	-	1·663
Sulphate of lime	-	-	-	4·975
Carbonate of magnesia	-	-	-	2·717
Sulphate of soda	-	-	-	1·489
Chloride of sodium	}			1·753
" " potassium				

13·157 grains per imp. gal.

Hall-lane well Source, No. 831.

Degrees of hardness, 8°20.

Silica	-	-	-	·600
Iron and alumina	-	-	-	·090
Carbonate of lime	-	-	-	·784
Sulphate of lime	-	-	-	3·884
Carbonate of magnesia	-	-	-	3·000
Sulphate of soda	-	-	-	1·272
Chloride of sodium	}			1·516
" " potassium				

11·146 grains per imp. gal.

It will be seen from these analyses, that both the sources named by Mr. Knowles are superior in quality to that of the water of the Low-well; in fact, they both of them appear to possess most of the requirements of a good supply for domestic and general uses.

I am not, however, prepared to say whether either of them are the best that could be adopted, or the best and most serviceable that could be found. To determine these important points is more than I am required to do in a preliminary Report, and the question cannot be settled until a detailed examination of the district has been instituted, and a survey of it made with a view of ascertaining the various works, and the means of adjusting them so as to give the town good water constantly laid on at high pressure, at a cheap rate and in abundant quantity.

If water at a cheap rate cannot be obtained, one of the main objects of the Public Health Act will be defeated, as it is expressly declared therein, that the Local Board must be able to supply water at a rate not exceeding 2*d.* per house per week, otherwise they cannot require it to be laid on to every dwelling-house, and I need not say that it is of the last importance that the dwellings of the poorer classes should be supplied with water as constantly and abundantly as those of the rich.

**THE PRIVY ACCOMMODATION.**—There is a very general scarcity of decent privy accommodation throughout the town, and in some of the streets, where one is made to serve for the common use of several houses, the condition of them is very defective. If the Public Health Act is applied to the district, the Local Board will be empowered to make great improvements with respect to these places; and it is to be hoped that when a supply of water is laid on, and works of sewerage and drainage carried out, owners of private property will see the advantage of substituting water-closets for common privies, and of closing up the cesspools and other receptacles into which the night-soil is now discharged.

With abundance of water on the constant system, and good underground drainage, waterclosets can be erected at a very small outlay, as there is no expensive apparatus required, such as is necessary when the supply is intermittent. The abolition of cesspools is much to be desired, for their existence is found to be always prejudicial, and sometimes fatal. Their ill effects may be experienced in two ways,—either from the pollution of the atmosphere caused by the noxious gases emitted from the decomposing night-soil, or from the pollution of the water of a neighbouring well, into which some of the contents of the cesspools may have escaped, by infiltration.

In either case the victim suffers from poison; he is either poisoned by inhaling impure air, or poisoned by swallowing

**polluted water; for it is, amongst medical and scientific authorities, a familiar and well-established truth, that the blood of a human being may be poisoned by the bad air of a cesspool or any other receptacle of offensive refuse, and that its effects may be as fatal as if he had swallowed poisoned water, or poison in any other form.**

**THE BURIAL GROUNDS.**—It will be seen from the evidence respecting the burial-grounds, that the Rev. W. Kelly, the incumbent of Shipley, estimates the extent of unoccupied space in the churchyard at about one sixth of an acre, but that there is some difficulty in making a precise calculation as the vacant ground is in detached portions. In the burial-ground attached to the Wesleyan Methodists chapel there are 91 square yards of vacant space, or about one half of the whole area. In the burial-ground of the Baptist chapel there is no unoccupied ground.

No evidence was given during the inquiry respecting the condition of these three burial-grounds, and from this circumstance, coupled with the fact, that two of them are not yet fully occupied, it may be presumed that the inhabitants have not as yet suffered any inconvenience from the condition of any of their burial-grounds.

Indeed all the three places of worship, having burial-grounds, are of such comparatively recent erection, that it is hardly possible that they could present any of those evils which are so familiar to the occupants of our older towns, where the same limited space has been used for centuries to inter successive generations of the inhabitants.

It must be borne in mind, however, that the population of Shipley has largely increased within the last few years, and that the number of inhabitants will be largely augmented by the building operations now in progress throughout the parish; before long, therefore, the burial accommodation will not be sufficient for the wants of the township, and it therefore behoves them to take steps to provide themselves with additional space. As far as the Local Board are concerned, the Public Health Act unfortunately, does not enable them to deal with this question; though it is much to be desired, for the sake of all our provincial towns, that some provisions were introduced into the Act, to enable Local Boards to have the control of any cemeteries within their districts.

**THE PUBLIC LIGHTING.**—It was stated by Mr. Henry Farrer, one of the inspectors for lighting the town, that

considerable reluctance was manifested by the ratepayers to pay a sufficient sum of money to defray the cost of the public lighting; they had only voted \$5*l.* to meet the expenses of the current year, and that amount was far below what was required, if the town were to be lighted properly.

Mr. Farrer also stated, that they experienced considerable difficulty in carrying out the Act under which they were appointed.

GENERAL REMARKS.—It will be seen from the statements contained in the previous parts of the Report, that Shipley in its existing condition, presents, in proportion to its size as many evils and defects as places of larger population and greater pecuniary resources. Although, therefore, it demands the application of the improvements contemplated by the Public Health Act as much as a town ten times its extent, it is a more difficult matter to suggest the nature of those improvements in a place like Shipley, where the population is not much more than 3,000, and where 510 out of the 693 ratepayers in the town are assessed upon property of less than 5*l.* value.

Under these circumstances it is essential, if the Public Health Act is to be effectually carried out, that the strictest economy should be practised in every part of the proposed works, otherwise the district will be burthened with an amount of local taxation more than it can sustain; and I need not say that it is hopeless to expect that improvements will be introduced upon their property by private individuals, if they discover that these will involve a serious expenditure, or one which is likely to lead to a reduction in the interest they now obtain from the investment of their capital.

On the contrary, to obtain for works of improvements the support they demand, before they can be successfully carried out, owners of property must be shown that they need not necessarily be put to a heavy outlay in laying on water to the houses of their tenants, in supplying them with the means of sewerage and drainage, or in otherwise making their habitations places of healthful and comfortable abode, but that they are necessarily subject to a large outlay as long as they neglect these remedial measures, for their tenants are more liable to sickness and disease, and every landlord knows that a sick tenant is not likely to be punctual with his rent. Nor is it in loss of rent alone that the

landlord suffers ; he has also to pay poor rates, which are certain to be increased or diminished in proportion to the state of health or disease in which the poorer portion of the population may be.

As a proof that works of sewerage and water supply must not necessarily involve a heavy outlay on the part of owners of property, I may be permitted to give some examples of the expense attending the carrying out of these improvements at Barnard Castle, where the Public Health Act has recently been applied, and where the sewerage and water supply works have been completed in accordance with its provisions.

The examples, I may further state, relate to cottages let at about 5*l.* a year each.

First, with regard to the water supply, 11 cottages have been furnished with an unlimited and constant supply of water, at a cost of 1*l.* 18*s.* 2*d.* for each house, which amount includes the cost of the supply to the watercloset, and the requisite soil-pans, taps, valves, &c.

The drainage of the same cottages, including the cost of the syphon traps, sinks, &c., amounts to 1*l.* 8*s.* 1*d.* for each house.

The public works of water supply and drainage are defrayed by a rate of 1*s.* 6*d.* in the pound, and the water is supplied to every house by means of a separate tap, for the trifling charge of 1*d.* in the pound on the rateable value of the property ; whilst by the distribution of the cost of the private improvement rates over a series of years, the total cost of these and the public works is reduced to an annual charge of 9*s.* 10½*d.* per cottage, or about 2¼*d.* per week.

Thus at an outlay not greater than the earnings of three or four days labour, a working man may provide himself and his family with the means of health, comfort, and cleanliness.

#### I THEREFORE RECOMMEND,—

That the provisions of the Public Health Act of 1848, and the Supplemental Act of 1849, except section 50 in the copies of the Act, 1848, printed by Her Majesty's printers, be applied to and throughout the township of Shipley.

I also recommend that the Local Board of Health shall consist of nine members, and that every member at the time of his election, and so long as he shall continue in office by virtue of such election, be resident, as in the said Public Health Act of 1848 is required, and be seised and possessed of real or personal estate, or both, to the value of 500*l.*, or

shall be rated to the relief of the poor of some parish, town  
ship, or place of which some part is within the said district  
upon an annual value of not less than 20*l*.

That the fourteen days notice of qualification required by  
the Public Health Act of 1848, to be given by the owners  
of property, in order to entitle them to vote at the said first  
election, be given to the person or persons to be appointed  
to conduct the said election.

I have the honour to be,

My Lords and Gentlemen,

Your most obedient humble servant,

WM. RANGER,  
*Superintending Inspector*

*To the General Board of Health,  
Whitehall.*

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